

# Recommendations of Actions for Resilience and Sustainability

# MAPUTO



Recommendations of Actions  
for Resilience and Sustainability

**MAPUTO**





**UN HABITAT**  
FOR A BETTER URBAN FUTURE



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The *Recommendations of Actions for Resilience and Sustainability* (RAR-S) proposed in this report, and the work undertaken to define them, are outputs of the “Making Cities Sustainable and Resilient Action: Implementing the Sendai Framework for DRR 2015-2030” (MCSR) at the local level. This MCSR action is a joint initiative of UNISDR and UN-Habitat and receives financial support from the European Commission (EC DEVCO). Its overall objective is to improve the understanding of, and capacity to, address disaster risks and build resilience at the local level, by supporting national and local disaster risk reduction (DRR) and climate change adaptation strategies, while focusing on building local capacities.

Since inception in April 2016, the MCSR action has supported over 25 local governments to confidently address the risk and resilience agenda in their cities, using adapted tools and methodologies while increasing capacities. This report details the findings and projected way forward for the city of Maputo, based on the resilience analysis and diagnosis channelled through the *City Resilience Profiling Tool* (CRPT). UN-Habitat and the Municipality of Maputo have led the implementation of the CRPT in the city and have successfully overcome challenges related to data collection and revision. The project has secured commitment from key actors that play a role in current and future steps.

This report details the findings, analysis, diagnosis, and commitment building, as well as the *Recommendations of Actions for Resilience and Sustainability* for the city of Maputo.

Barcelona City Council facilitated the project both through peer support to Maputo Municipality and through its ongoing support to UN-Habitat’s normative and operational work. Architecture without Borders supported this initiative under ongoing projects in the city of Maputo. Lastly, we extend our thanks the Municipality of Maputo and EC DEVCO for making this report possible, and encourage all project participants to continue being proactive in the city’s progress towards resilience.



This report has been written with the collaboration of an extensive inter/trans-disciplinary team and, as such, some of the terms have been translated directly from English. Substantial effort has been made to find equivalents in all target languages (Portuguese / Spanish / French) however the report proposes terms that are being developed in the relatively new field of urban resilience science.

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This report is the third phase of the City Resilience Profiling Programme 'Giving back' process and accompanies the City / CRPT Databases (phase 1) and the city visuals platform (2 phase). This report should be read in combination with the City Resilience Profiling Tool guide and with the other deliverables developed in phases 1 and 2.





# Executive Summary

## Logic of the Current Scenario: Data Collected and Analysis

The result of the analysis carried out in Maputo presents, as a snapshot, the Current Scenario; that is, the city's current situation regarding resilience. This is completed by an analysis and mapping of the actors and the governance framework, along with external / exogenous events (shocks), internal / endogenous ongoing pressures (stresses) and conditioning factors identified as priorities in the city.

For the statistical analysis, the a series of indicators are grouped into eight thematic groups (Urban Elements) offering sectoral information, namely: Built Environment, Supply Chain and Logistics, Basic Infrastructure, Mobility, Social Inclusion and Protection, Municipal Public Services, Economy and Ecology.

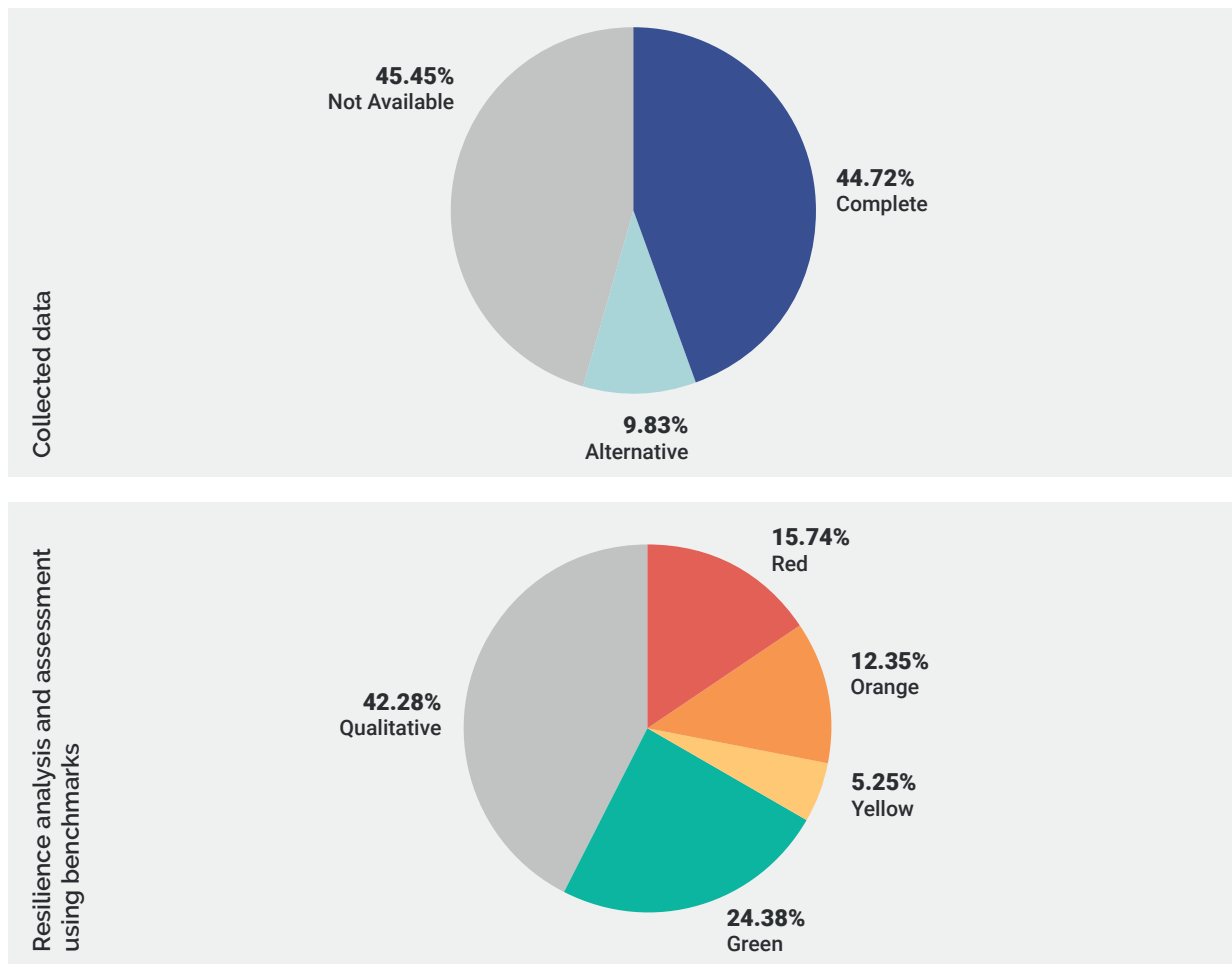


Figure 1: Visualisation of results after data collection and resilience assessment. Source: CRPT (2019).



After the initial analysis, 55% of the indicators were collected. This percentage is reasonable considering that this is the first time such a survey has been carried out, and on many occasions, given data limitations, it was not possible to answer the exact question. However, this also reinforces the need for the City Council to systematically carry out data collection from the various sectors and update these data over time; available and up-to-date information helps in decision making and the prioritisation of actions.

Regarding resilience, Maputo still has a lot of work to do. Only approximately 25% of the results indicate that the City is performing well or reasonably well in terms of resilience. In addition, more than 40% information was unavailable at the time of this analysis, indicating the true performance is potentially worse than available evidence suggests. Once all the results have been analysed, there are some conclusions that are shared by all Urban Elements:

- There is a general lack of reliable data and information to help evaluate the performance of each sector. There is a need to improve the system for collecting, analysing and updating existing information in the City Council so that the institution can make use of it to improve revenue, identify new interventions, prioritise actions and negotiate with other stakeholders.
- Although there is very up-to-date legislation (both at the National and Municipal levels), it is necessary to disseminate legislation updates among the Municipality's technicians and to work more on their effective compliance.
- It is still common today to confuse the concepts of resilience and emergency. There is a misconception that a resilient city is one that responds to emergencies promptly, regardless of its ability to recover after a disaster, or that a resilient city "is lucky because emergencies hardly ever happen".



**Figure 2:** Resilience and emergency. Source: CRPP (2019).

The following are the main conclusions of each of the Urban Elements:

### **Built Environment**

- Rapid growth of Maputo, which makes territorial planning difficult
- Proliferation of informal settlements, where 70% of the city's population lives
- 35% of housing is located in hazardous and environmentally sensitive areas (with the consequent degradation of ecosystems)

### **Supply Chain & Logistics**

- Heavy reliance on higher-priced commodities (mainly food) from neighbouring South Africa.
- Inadequate domestic road network.

### **Basic Infrastructure**

- Inefficient or unreliable water and electricity networks. High levels of drinking water waste and insufficient use of rainwater.
- Poor wastewater treatment (health and environmental problems), with 50% of the population without access to safe treatment services.
- Coal (63.5%) and firewood (14.9%) remain main domestic fuels (perpetuates environmental deterioration).
- Environmental problems derived from the insufficient application of "3R" (reduce, reuse, recycle).

### **Mobility**

- High level of congestion due to various factors (informal economy, etc.).
- Need of improving the urban environment and enhancing walking (e.g. sidewalks).
- Unclear regulatory and institutional frameworks, insufficient to meet demand.

### **Municipal Public Services**

- There are heritage and cultural activities, but access to such activities is uneven across the city (instance of social inequity).
- High level of insecurity in the city (mainly in the outskirts); it is necessary to increase coverage of public lighting.
- Malaria and HIV are key public health issues.

### **Social Inclusion and Protection**

- Limited involvement of Civil Society Organizations (CSOs).
- Overburdened schools (high demand, overcrowded facilities).
- Sanitary facilities of the city under great pressure (exacerbated by the proliferation of malaria cases at certain times of the year).
- Little attention provided to people with special needs (accessibility problems, etc.).

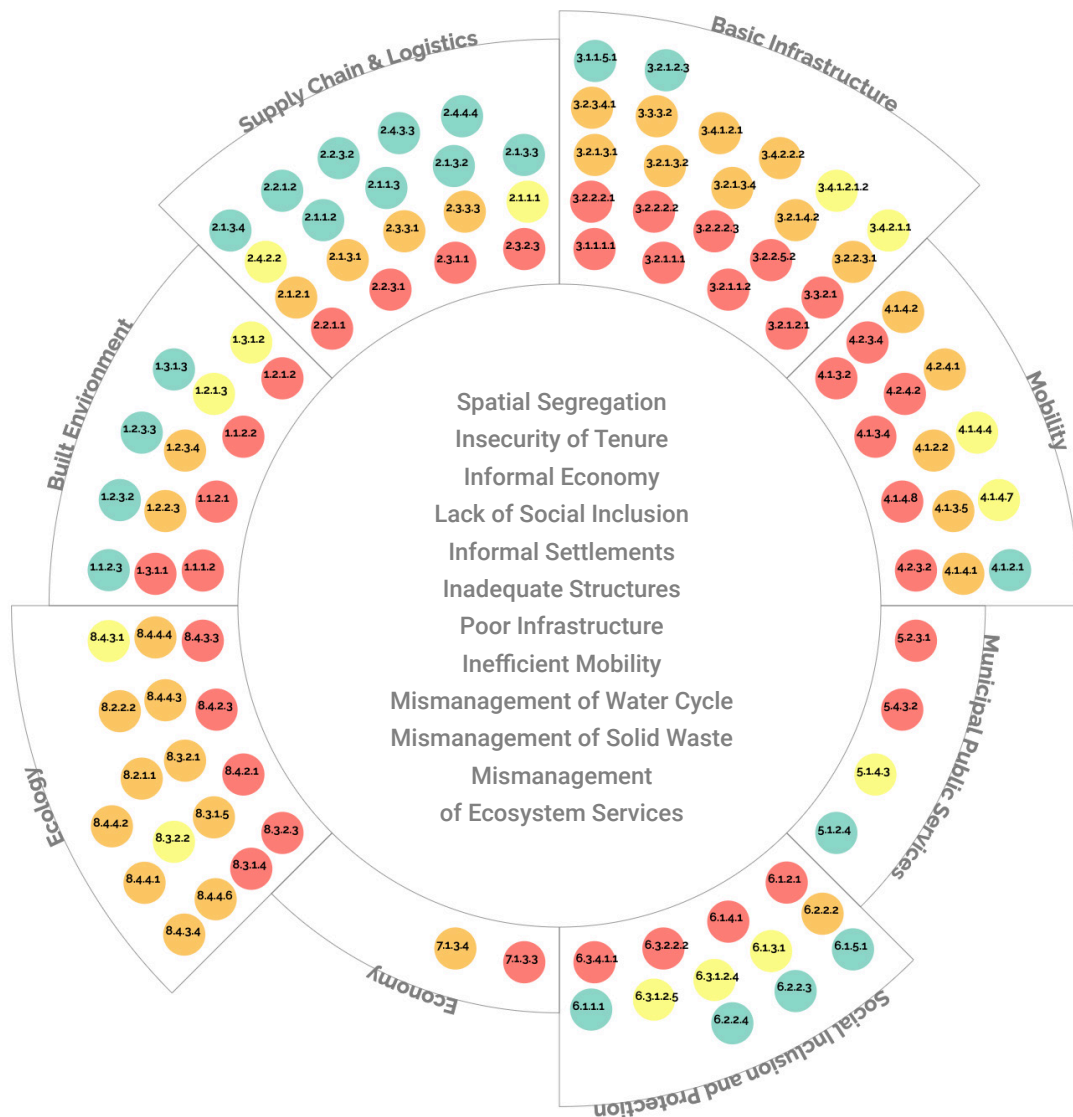
### **Economy**

- High level of informal employment (52%).
- High unemployment (28.9%), especially among young people (39.7%).
- Inequality (at both municipal and national level).
- Low revenue from land use and real estate.

### **Ecology**

- High levels of pollution
- New initiatives that encourage the maintenance of ecosystems have started to emerge, which should be monitored and enforced by the Municipality.

The methodology undertaken as a part of this analysis presents the results visually, using colours to reflect the measurable performance for a particular supporting indicator: 'red' represents the most critical indicators, 'orange' and 'yellow' reflect intermediate situations and 'green' suggests a satisfactory situation.



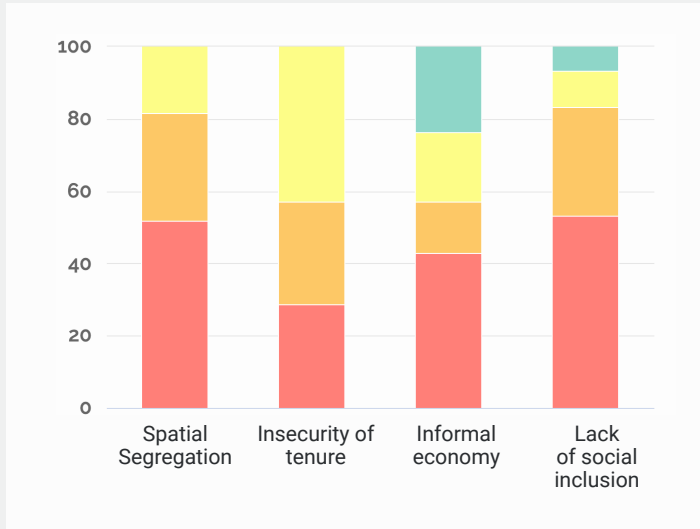
**Figure 3:** Maputo's Current Scenario. Stress identification from the study of Urban Elements. Source: CRPT (2019).

As a result of this statistical analysis, and following the CRPP methodology, the city's stresses were identified. These are defined as chronic and continuous dynamic pressures originating within an urban system with potential for cumulative impacts on the system's ability to achieve its objectives. Identified stresses were grouped into three 'major' stresses or endogenous issues that condition the city in terms of resilience, namely:

1. Rapid and unregulated urbanisation
2. Socioeconomic inequity
3. Inefficient management of urban metabolism

Within each of these areas ('major stresses') there are defined stressors (stress factors). Stresses and stressors have been confirmed by the Municipality in a series of workshops and conversations involving senior officials carried out throughout the implementation process.

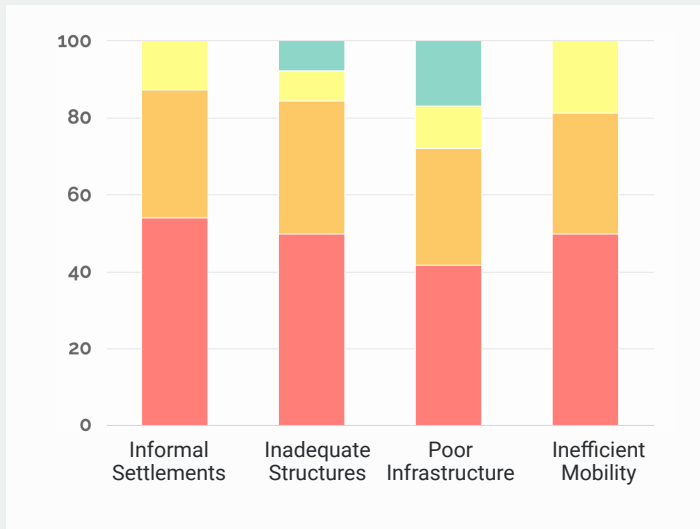
Socio-economic inequity



Socio-economic inequity

- Spatial Segregation - zonification
- Insecurity of tenure
- Informal economy
- Lack of social inclusion

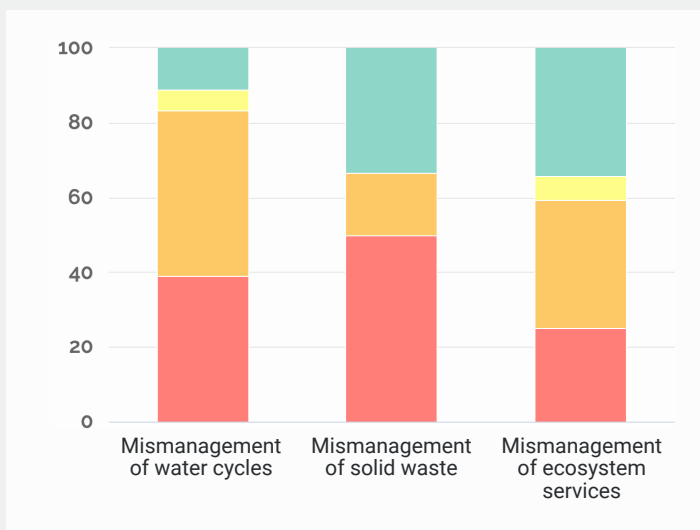
Rapid and Unregulated urbanization



Rapid and Unregulated urbanization

- Informal Settlements
- Inadequate Structures
- Poor Infrastructure
- Inefficient Mobility

Miss-management of urban metabolism



Miss-management of urban metabolism

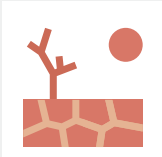
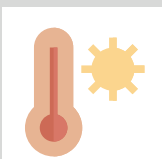


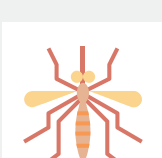
- Mismanagement of water cycles
- Mismanagement of solid waste
- Mismanagement of ecosystem services

Figure 4: Relationship of negative performance of CRPT indicators and the generation of stressors by each respective stress. Source: Prepared by CRPP with information from the CRPT data collection process (2019).

There also exist exogenous or external causes that clearly affect the city. They are called shocks , defined as uncertain, abrupt or long-onset events that have the potential to impact the purpose or objectives of an urban system). Five shocks were identified as priorities in Maputo:

**Natural:** Drought, Heatwave, Flood and Cyclone.

**Biological:** Malaria

	<b>Drought</b>
	<b>Heatwave</b>
	<b>Flood</b>
	<b>Cyclone</b>
	<b>Malaria</b>

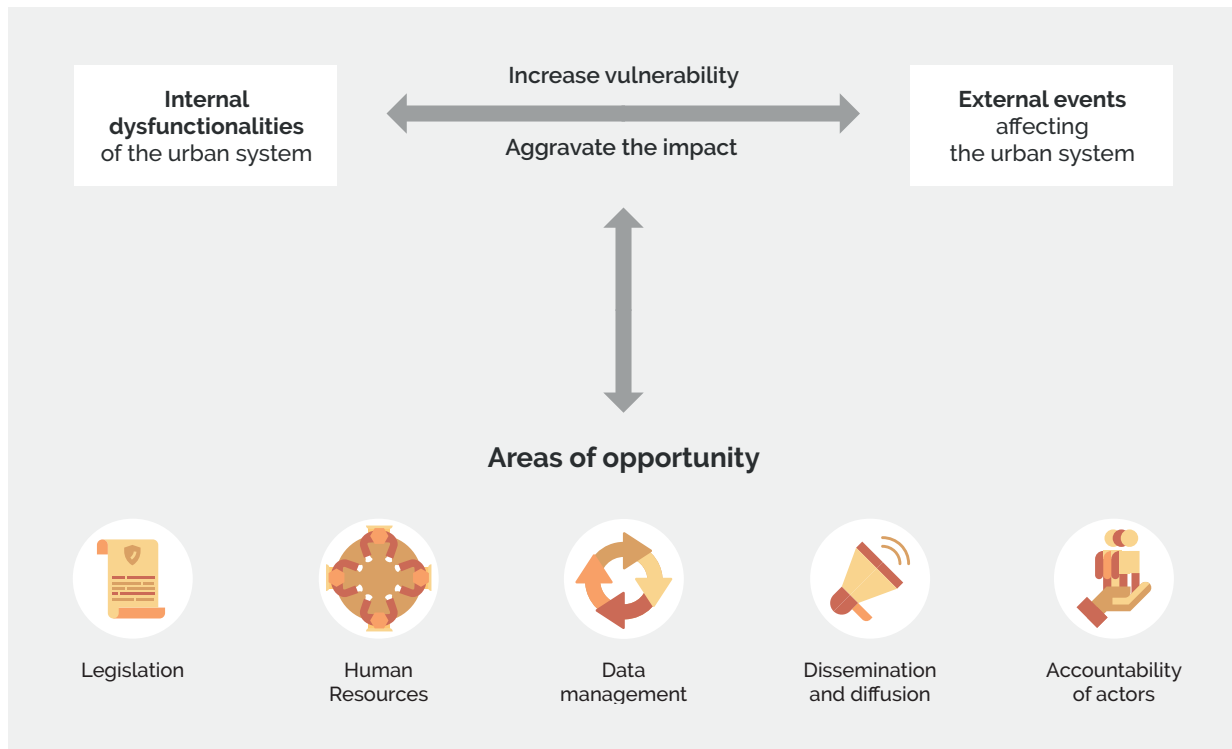
**Figure 5:** Priority Shocks in Maputo. Source: CRPT (2019).

In order to prioritise shocks in Maputo, the following criteria were considered:

- a. The evaluation of the impact each shock generates on the population, resources and processes
- b. Frequency of events and their impacts on different areas of the city and its population.
- c. Analysis of how the different Shocks act on the different elements and components of the urban system, considering the interdependencies between these constituent parts of the urban system.
- d. Projections of climate change trends in Maputo and how these trends may aggravate the impacts of identified shocks.

It should be noted that Maputo City and the development of its Resilience Profile with UN-Habitat served as a case study for the Global Users Copernicus Change Service (Glorious) Project, developed by Lobelia for Isardsat. Thanks to data provided by European satellites and based on defined and calibrated models, it was possible to obtain key information on climate change trends in the city. These trends indicate rising temperatures and the likelihood of storms and floods that may affect the incidence of malaria.

Identified stresses, stressors and shocks must to be placed in the general context of Maputo Municipality governance structure and processes in order to take into account contextual constraints, which are crucial to structuring action-oriented strategies. Contextual constraints are in fact conditions that, when properly directed or oriented, can be harnessed to reinforce the resilience of the city.



**Figure 6:** Linking Shocks and Stresses with other constraints or conditions. Source: CRPT (2019).

From the analysis of governance and of relevant actors involved in the implementation of initiatives, key information was obtained including, but not limited to:

- Local Government and National Government remain highly connected despite the existence of decentralisation policies, which consider Local Government (municipalities) as autonomous bodies.
- There exists significant influence and levels of participation of relevant institutions in development efforts in the city, including partners in development and cooperation, such as the World Bank, AfDB, foreign governments, and the United Nations.
- The lack of effective coordination between actors operating at the local level is a constraint to the sustainable management of funds allocated to the implementation of various initiatives, increases the redundancy of interventions and functions.
- There is a significant need to strengthen coordinated action as well as communication processes between actors.
- General data on the role of actors in risk reduction and their relationships is limited. Available data, however, indicate relatively dominant roles of national agencies and bodies in the development and implementation of risk reduction measures and strategies.
- There seems to be a good level of coordination between national and local actors in terms of emergency response and humanitarian disaster relief. However, little data is available on how these actors are interconnected and cooperate on long-term risk mitigation measures.

## The Logic of the Trend Scenario: Legal and Regulatory Framework

Building off of the Current Scenario, the Trend Scenario can be developed, through assessing how the application of existing policies, programs, initiatives and projects would affect the resilience of the city – simply put: if it would improve, worsen or remain the same.

Therefore, the Trend Scenario emerges when applying the policies, plans and strategies prepared and / or approved to the Current Scenario, as these documents "direct" the path by which the city will be headed.

As figure 7 shows, application of existing plans, policies and projects to the Current Scenario would change the situation of the city completely: it would considerably increase the number of 'green' indicators, or areas within which the city is operating in a satisfactory situation.

However, it is not the lack of plans, policies and strategies that holds Maputo in its present state. Mozambique is a country with very advanced legislation and Maputo is a city where numerous studies, research, plans and strategies have been carried out. To this point, as a part of this analysis, 79 existing documents from all administrative levels and states of approval of were compiled and evaluated, including documentation related to sector planning, development, and territorial planning.

After a first review of the documentation, it is clear that:

- 12 of the documents are local.
- Only 7 of the local documents have been officially approved.
- The stresses analysed appear in several of the documents.
- Some existing policies, strategies and legislation are not implemented and in some cases are not well known, even by those working in relevant sectors.

Therefore, we can say that the purpose of this analysis and proposed Actions for Resilience:

- This is not about creating new laws; it is a question of effectively applying those that already exist.
- It is not a matter of preparing another study or analysis; it is about seeing the applicability of those that have already been conducted considering aspects that, perhaps, were left aside: for instance, the sustainability and real capacity of the Municipality.

Based on this perspective of analysing the existing strengths that the Municipality possesses, efforts that are successfully performed in the priority areas (identified stresses), and an understanding of the importance of the sustainability of any intervention, Actions for Resilience (A4R) are proposed. These are grounded actions that envision the shared responsibility of various key actors and aim not to improve the resilience of the city overnight, but from the inside out.

Figure 7: Process of building a Resilient and Sustainable Scenario. Source: CRPP (2019).





### Trend Scenario

Policies, plans and initiatives



### LINES OF ACTION

Recommendations for policies



Pilot projects



Recommendations for projects



Recommendations for programmes



Recommendations for plans



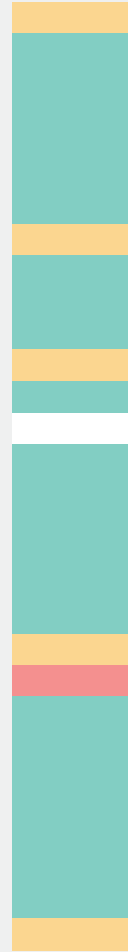
Recommendations for regulations



### A4R



### Resilient and Sustainable Scenario



# Logic of the Resilient and Sustainable Scenario: Actions for Resilience

The proposed Actions for Resilience are organised into three distinct types of action, taking into account the realities of Maputo's Municipality, according to the feasibility and immediacy with respect to their possible implementation.

Proposals are therefore organised taking into account the intersection of various perspectives or approaches.

**Considering the degree of participation / responsibility that the Municipality has or may have in implementing actions. The three types of action are defined as follows:**

### 1. Direct Implementation:

The Municipality can implement these actions directly, as they depend on its own decision and / or competence. This group constitutes all the measures proposed by the administration, already approved at local level.

Example: Placement of elements that prevent parking on sidewalks to promote their recovery for pedestrians, especially pedestrians belonging to the most vulnerable groups (people with reduced mobility, children, elderly, etc.).

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### 2. Agreement:

The Municipality can induce actions through consultation with other relevant actors or agents, maintaining leadership capacity and / or lobbying proactively to ensure that this measure is implemented. For these actions, the capacity, power, and interest of other actors, such as those from the private sector or civil society organisations, is relevant.

Example: In introducing segregated collection of waste, it is necessary to identify the possible actors interested in the collection of various waste types.

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### 3. Advocacy:

Actions requiring and advocacy approach are those that are not already legally approved or those made at a different level than the local level. These include issues that directly affect the Municipality, but for which the local government has no legal mechanism to perform the action. The local government can only exert pressure or advocate for implementation, as these actions depend on higher level institutions and require legal or competence changes.

Example: Definition of the metropolitan region at the administrative level, which would require/enable the identification of services and shared competences (e.g. transportation, waste, water, etc.), an effort which sits outside of the purview of the local government and requires high level institutional cooperation.

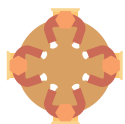
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Considering some existing conditions as areas of opportunity to be leveraged, taking advantage of the past experiences, learning from them and looking to the future with a new perspective. These areas of opportunity are:



#### 1. Legislation:

At the present moment, in relation to existing legislation, existing and / or planned and / or approved plans and policies.



#### 2. Human Resources:

The existing Municipality staff, its structure and organisation (looking at the need for coordination between some departments / directions as well as to avoid overlap or duplication of efforts).



#### 3. Information Management / Institutional Memory

The “memory” or information management capacity that the Municipality has (linking the two previous conditions), as people may be transient but institutions remain.



#### 4. Replication of Best Practices:

Successful experiences or actions that are in progress or have already taken place, with the aim of continuing or replicating them.



#### 5. Accountability of the actors:

The role of the Municipality as “city manager”, sharing duties and responsibilities with residents and the private sector.

Based on the identification of stresses and shocks made in the Current Scenario, four critical lines of action were defined to frame the proposed Actions for Resilience. The four lines of action are: Urban Informality, Urban Transport and Mobility, Urban Metabolism Management, and Management and Recovery of Critical Ecosystems.

The criterion for defining these critical lines of action includes the possibility to generate action to address complex, interconnected issues that are difficult to differentiate. For instance, Urban Informality may emerge from a lack of infrastructure or the informal economy of spatial segregation and land tenure challenges.

Along with the critical areas three integrating actions are identified: the Revitalization of the Municipal Archive, the Revision Urban Structure Plan (PEUMM) and the Establishment of a Resilience Unit (UR). These actions come from an analysis of opportunities in areas such as legislation, human resources, information institutional memory, the replication of excellent initiatives and the involvement of actors.

## Integrating Resilience Actions

In addition to the proposals presented by the critical area of activity, three actions considered of great importance were proposed impact on the different areas covered and, in some way integrating all of the above. These actions can be implementation and direct responsibility of the Municipal Council and represent a mechanism for support for the implementation of the other proposed actions:



### Revitalization of the Municipal Archive

There is little awareness of people's transience within institutions compared to the impact of that transience on an institution's operations. Hence the importance and necessity of leaving a record of the conducted activities, consistently updating records, and ensuring knowledge of the existence of recorded information (in order to be able to provide data when necessary) is maintained.

In recent years, the structure and organisation of the Municipal Archive has improved considerably. Improvement of facilities and training of technicians was recognised by CEDIMO (National Center for Documentation and Mozambique Information). The Municipal Archive is now able to support the rest of the municipal departments in some key areas, for example:

- Legislation management, dissemination of legislative updates and interdepartmental training. Provide support to the Municipality's Legal Office.
- Documentation of best practices; providing reliable information to prepare proposals and request for support from other actors.
- Create the Municipality's institutional memory and disseminate it in such a way that the feeling of belonging to Maputo City makes the residents more committed to their city and ensures the sustainability of the actions implemented.



### Review of the Urban Structure Plan (PEUMM)

The Urban Structure Plan (PEUMM) is a tool that guides the spatial and territorial organisation of the Municipality. According to the Spatial Planning Law spatial and territorial plans have a ten-year term. Maputo City is now in an excellent position to address the PEUMM review and update as there is a greater awareness of the risks to which the city is exposed, and the problems posed by climate change. The shocks and stresses presented in this report as a result of the collection and analysis of indicators and the reading of documents and miscellaneous legislation should guide the review of the PEUMM.

- The PEUMM was approved in 2008. Revision and update of the PEUMM, in accordance with the deadlines established by law, should incorporate the major trends observed and new challenges facing Maputo. This action is a great opportunity to establish the direction towards which the city should move in the future.
- Opportunities for collaboration with national and international organisations should enable Municipality to successfully address the challenges the city faces.



### Creation of a Resilience Unit (UR)

Resilience is an approach, a “way of looking” that the City Council and municipal departments must share, although it takes time to adjust to this new vision. The City of Maputo faces a complex situation with regard to exposure to shocks and stresses. Having a Resilience Unit that helps incorporate resilience criteria and an awareness of working in a coordinated manner would improve problem solving and reduce the negative impacts of shocks and stresses to which the city is exposed.

- The creation of a Resilience Unit (UR) has been proposed within the Maputo City Council structure, which would provide a forum for the vision of Urban Resilience and support its dissemination to the rest of the Municipality. Terms of Reference (ToR) for the UR were produced and should be discussed and analysed by the Municipal Council to determine the appropriate fit for a potential UR.

# Critical Lines of Action



## Urban Informality

This critical line of action is closely linked to rapid urbanisation combined with little to no regulation, a dynamic detected as a stress in the diagnostic phase. Taking holistic actions addressing urban informality can improve the situation of informal settlements while simultaneously improving the status and coverage of basic infrastructure.

It should also be noted that intervention in urban Informality will reduce socioeconomic inequalities. To this end, inclusive policies must be successfully developed that contribute to the economic development of the inhabitants of informal areas, thereby improving their ability to access basic services.

### Linked to Municipal Archive

#### Example action 1:

Continuity of the working methodology implemented in the Architects Without Borders project with the Municipal Council in Chamanculo C neighbourhood<sup>1</sup>- the work of this organisation is best practice that must be replicated. It primarily involves the Municipality and residents living in the areas under intervention. A future phase, wherein the private sector, that must provide services and basic infrastructure once the urban layout has been regularised, will allow for better access to this type of services. This proposed action is also one of direct implementation, as it assumes the continuity or replication of a working methodology that has already been (and is being) successfully implemented, efforts that should also be recorded in the archive (if it is to be replicated in the future). It is also an action that involves the commitment of the three city actors, (City Council, private sector and citizens) which helps to ensure the sustainability of the intervention.

### Linked to the Urban Structure Plan Review (PEUMM)

#### Example action 2:

Review and update of the Municipal DUAT / identification of inconsistencies and legal voids – this action was identified within the framework of the NGO Architects without Borders project; when the Municipality's own technicians (who are familiar with the problems and consequences these inconsistencies and legal voids) conveyed that this action should be seen as a priority as it would have a major impact on this issue. This is a direct implementation action, which should take advantage of existing legislation to update it as well as the knowledge and experience of the Municipality's staff in this area.

### Linked to the creation of a Resilience Unit (UR)

#### Example action 3:

Involvement of new actors – the UR as a coordinating element to support involvement of other institutions in this working methodology (NGOs, academia and others). Considering the currently available GIS database being developed under the SEC-GD<sup>2</sup> Project - Urban Action Plan George Dimitrov's Strategic Improvement Plan – UR could promote updating the database and making it available to other Municipal departments. It is a direct implementation action that would require the coordination of human resources from different Municipal departments and other independent institutions.

<sup>1</sup> Architecture without Borders (AWB). (2018-2019). HABITAT PROJECT - "Defending the right to access to the city through participatory urban reorganization and access to the DUAT title in the informal neighborhoods of Maputo". Partners: Maputo City Council and the Mozambican Bar Association (Institute for Access to Justice). Funders: Council of Barcelona, Fundación SELAVIP, Council of Pamplona, Generalitat Valenciana and Italian Cooperation.

<sup>2</sup> SEC-GD Project: Department of Urban and Territorial Planning of the Universitat Politècnica de Catalunya • BarcelonaTech. Local partners: Maputo Municipal Council and the Faculty of Architecture and Physical Planning of the EMU. Contact: Maputo. etsab@upc.edu. arwen.p.gumbao@upc.edu/Financed by Ajuntament de Barcelona and the Cooperation Center of the Polytechnic University of Catalonia • BarcelonaTech.



## Transport and Urban mobility

The state of urban mobility in Maputo is a problem and consequence of the characteristics of the city (e.g. the existence of informal settlements with inadequate streets, the scope and scale of the informal economy, etc.). To get a full picture of the problem, one has to look beyond the municipal territory and recognise the interdependence / relationship that Maputo has with Matola City and Marracuene District. The Municipality of Maputo has undertaken various initiatives, such as the definition of Gran Maputo, which includes the municipalities of Maputo, Matola and Boane and a part of Marracuene District and the establishment of the Metropolitan Transport Agency, which operates under the responsibility of Ministry of Transport and Communications.

All actions undertaken so far to improve mobility within Greater Maputo (from city centre to small neighbourhoods and vice-versa) have emerged from the Municipality's coordinated work with other actors (cooperation partners, NGOs, ministries and other administrations). Despite the path taken, it is necessary to continue working in this area to reduce mobility challenges, while at the same time promoting the environment and generating better possibilities for the socio-economic development of the region's inhabitants.

### Linked to Municipal Archive

#### Example action 1:

Support in consolidating the legal identity of METROPOLITAN AREA / REGION (as a supra-municipal entity) and for the sharing of other areas of responsibility (garbage collection, provision of drinking water, etc.). This action will bear fruit in the medium to long term. This is an action of agreement involving the collaboration and coordination of various partners of the Municipality (who have already received initial support from the Barcelona Metropolitan Agency and UN-Habitat); but it is also an advocacy action. The Municipality of Maputo, together with the other administrations that make up Greater Maputo should advocate for an "official" definition of this administrative step, which is included in the legal framework, as it will pave the way for other cities in the country facing similar situations in service sharing (Beira-Dondo, for example).

### Linked to the Urban Structure Plan Review (PEUMM)

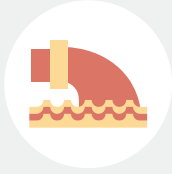
#### Example action 2:

Legislating the parking situation on city sidewalks - this aspect of mobility is often forgotten, but every citizen should be protected. The proposed action aims, under the leadership of the Municipal Council, to ensure the safety and traffic of pedestrians on the sidewalks, especially considering the problems currently facing the most vulnerable people (people with reduced mobility, children and the elderly). Legislation addressing parking on the sidewalks already exists but is not enforced. This is a direct implementation action that involves the three city actors (City Council, private sector and citizens), wherein each actor has their share of responsibility. However, there also exists an opportunity to work with other partners (NGOs, Ministry of Education and Human Development, etc.) to educate and raise awareness of new generations and thus ensure the action's sustainability (by changing attitudes).

### Linked to the creation of a Resilience Unit (UR)

#### Example action 3:

The Resilience Unit shall be a coordinating entity that shall ensure that mobility issues are addressed from a people-centre approach. These themes should be focused on and worked on collaboratively with other matters, as the urban fabric (e.g. how best the urban fabric can be modified to minimise mobility problems); gender (do safe transport systems exist for women and girls?); effects on CO<sub>2</sub> and other gas emissions and consequently the public health impacts on Maputo residents as a result of mobility.



## Management of Urban metabolism

This critical line of action aims primarily to improve water cycle management, including the treatment of solid waste. Although the competencies of the provision and management of water and solid waste management belong to different scales (national and local), action design can be approached from a joint perspective to harness synergies, try to generate opportunities, and at the same time to foster socioeconomic development.

### Linked to Municipal Archive

#### Example action 1:

Support in consolidating the legal identity of METROPOLITAN AREA / REGION (supra-municipal entity) and for the sharing of other areas of responsibility (garbage collection, provision of drinking water, etc.). This action will bear fruit in the medium to long term. The current Metropolitan Transportation Agency focuses only on mobility issues and needs expand its scope to include other services essential to the urban metabolism such as water cycle management.

### Linked to the Urban Structure Plan Review (PEUMM)

#### Example action 2:

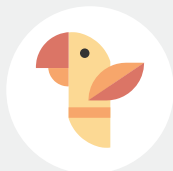
Require the placement of elements to ensure rainwater collection and use in new buildings to be approved by the Municipality - This proposed action is for the Municipality to ensure effective compliance with the Ministerial Order of 7 October 2005 for the Minister of Public Works and Housing: obligation to provide rainwater catchment systems in public buildings of new construction. This requirement can be extended to new private buildings to minimise the use of drinking water for irrigation and other similar uses as well as the consequences of large amounts of water running down the streets (gutter clogging, etc.). This is a direct implementation action that involves the establishment of specific legislation (of municipal competence) as well as its compliance (HR of the Municipality).

### Linked to the creation of a Resilience Unit (UR)

#### Example action 3:

Begin separate collection of organic / non-organic waste for composting (mainly in markets) - The Municipality has already established a Strategic Plan for this sector, which presents a comprehensive overview waste collection challenges. The proposed action falls under the purview of this guiding document, being clearly of direct implementation, while greatly benefiting from the involvement of citizens and the private sector. Organic waste collected in the markets may be turned into revenue to the Municipality (by selling the product as processed manure) as well as a reinforcement for "machambas" activities (which serves as the economic livelihood for many families). UR could act as the responsible party within the Municipality and oversee coordination and planning between departments.





## Management and Recovery of Critical Ecosystems

This line of action stands out for its transversality. All existing legislation and documentation related to the previously discussed lines of action also address environmental issues and the need to maintain ecosystem balance.

In Mozambique, there are various national strategies, policies and laws, such as the Climate Change Mitigation and Adaptation Strategy and its successive, derivative initiatives.

In addition, Maputo's Municipality has already spent time working with various partners in different fields related to the care and maintenance of the various ecosystems existing in its territory. Further work in this area is needed to improve the state and management of ecosystems through the coordination of initiatives and political and citizen awareness.

### Linked to Municipal Archive

#### Example action 1:

Working with the Ministry of Education and Human Development (MINEDH) to include ecosystem care issues in the school curriculum. The history of ecosystem degradation in the city cannot be changed. However, there is still in time to slow down the environmental deterioration and to recover some of the destroyed ecosystems. The proposed action envisions the institution responsible for education (MINEDH) to include key environmental issues in the school curriculum including activities outside the classroom. These key issues could include, but not be limited to, the explanation of existing fauna and flora and the consequences of their disappearance. The Municipal Archive could make existing environmental information available from the past decades up until the current situation. The creation of public exhibitions and the involvement of academia can help raise and reinforce awareness.

### Linked to the Urban Structure Plan Review (PEUMM)

#### Example action 2:

Ensure the protection of environmentally sensitive areas (Katembe and Ka-Inhaka) through their identification in the revision of the PEUMM and establishing specific legislation to protect targeted areas. This direct implementation action assumes the legislation (LOT - review of the PEUMM after 10 years) and aims to learn from what has occurred and, where possible, seek to mitigate ecosystem deterioration.

### Linked to the creation of a Resilience Unit (UR)

#### Example action 3:

Support the initiatives of civil society organisations to clean up beaches and other sensitive areas through the allocation of staff and equipment. It is an agreement action, in which the Municipality must leverage the capacities of CSOs using the supportive resources available to the Municipality. These types of action may complement the action linked to the Municipal Archive by joining education-oriented efforts with a more global and sustainable approach. The UR would have a role coordination between the institutions involved (the departments of the Municipality, CSOs and others).

A municipal agenda should be elaborated and prioritised related to the design and implementation of the Actions for Resilience (A4R), based on the previously defined areas of opportunity. The agenda should be shared and establish the need for comprehensive, sustained interventions over time beyond the political cycles of the Municipality. It is necessary to emphasize that, along with the process of implementing Actions for Resilience, Maputo has, as its biggest challenge, the alteration of its urban model, a process which is imperative to formalise the Resilient and Sustainable Scenario to which it aspires.

Finally, it should be pointed out that the proposed Actions for Resilience are a first exercise from the Maputo City Council. The Municipality has a very experienced and knowledgeable technical team and is best suited to promote these Actions for Resilience.

Maputo City is invited to modify its urban model from a resilient lens, and in collaboration with other key stakeholders in the city, ensure this urban model is sustainable.







## Glossary

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<b>Access</b>	<p>Ability of the rights-holders to use or benefit of a certain service or product.</p> <p>NOTE: Restrictions can be caused by distance to the source (e.g., water supply network does not reach a certain neighbourhood) and unaffordability (e.g., service is too costly for a certain household or group of people), amongst others.</p>
<b>Alternative sources</b>	<p>Sources that differ from the main city source(s).</p> <p>NOTE: Particularly applicable for electricity (e.g. generators) and water (e.g. bottled water) supply.</p>
<b>Basic social services</b>	<p>Set of services delivered in education, health, and social areas, as a means to fulfil basic needs.</p>
<b>Biodiversity</b>	<p>Variability among living organisms from all sources including, land, marine and other aquatic ecosystems, and the ecological complexes of which the organisms are part.</p> <p>NOTE 1: This includes diversity within species, between species, and of ecosystems. Biodiversity is thus not only the sum of all ecosystems, species, and genetic material, but rather represents the variability within and among them.</p> <p>NOTE 2: Biodiversity can also be referred to as biological diversity.</p> <p>[SOURCE: Chan, L., et al. User Manual on the Singapore Index on Cities' Biodiversity (also the City Biodiversity Index), 2014]</p>
<b>Built-up areas</b>	<p>Developed area based on built-up pixels.</p> <p>NOTE 1: Can be urban, suburban or rural.</p> <p>NOTE 2: Built-up area is considered urban if the built-up pixels have urban values greater than 50%, suburban if between 10-50%, and rural if less than 10%.</p> <p>[SOURCE: Atlas of Urban Expansion. The City as a Unit of Analysis and the Universe of Cities. 2016].</p>
<b>Challenges</b>	<p>Long-term contextual changes and pressures originated outside the urban system that also undermine the city's capacity for sustainability and resilience.</p>
<b>Captured open land</b>	<p>All open space clusters of less than 200 hectares that are fully surrounded by urban and suburban built-up land pixels and the fringe open space around them.</p>
<b>Civil society</b>	<p>Wide range of individuals, groups of people, networks, movements, associations, and organisations that manifest and advocate for the interests of their members and others.</p> <p>NOTE 1: They can be based on philanthropic, cultural, religious, environmental, or political values and convictions.</p> <p>NOTE 2: This definition excludes for-profit companies and businesses, academia, and all government-dependent entities.</p>
<b>Civil Society Organisations (CSOs)</b>	<p>Formal associations in which society voluntarily organises around shared interests.</p> <p>NOTE 1: They include political, cultural, environmental, and faith-based organisations, as well as non-profit and non-governmental organisations.</p> <p>NOTE 2: CSOs are institutionalised organisations, bearing some form of legal status, that represent particular groups of society and are involved in service delivery.</p>

<b>Climate change adaptation</b>	<p>Increased ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production.</p> <p>[SOURCE: UNEP]</p>
<b>Climate change mitigation</b>	<p>Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognising that this would significantly reduce the risks and impact of climate change.</p> <p>[SOURCE: UNFCCC]</p>
<b>Connectivity</b>	<p>How a landscape is configured and how it allows species to move through its different elements.</p> <p>NOTE: A high degree of <i>connectivity</i> is generally linked to low fragmentation.</p>
<b>Contingency planning</b>	<p>Management process that analyses disaster risk and establishes arrangements in advance to enable timely, effective, and appropriate responses.</p> <p>[SOURCE: UNISDR, 2017]</p>
<b>Coverage</b>	<p>Capacity of the duty-bearer to provide a service or product.</p> <p>NOTE It may be influenced by its financial capacity, by geospatial setting and the normative and institutional frameworks.</p>
<b>Critical facilities</b>	<p>Physical structures, networks, and other assets which provide services that are essential to the social and economic functioning of a community or society.</p> <p>[SOURCE: UNISDR, 2017]</p>
<b>Decentralised authority</b>	<p>Local authorities, distinct from the state's administrative authorities, who have a degree of self-government, elaborated in the framework of the law, with their own powers, resources, and capacities to meet responsibilities and with legitimacy underpinned by representative, elected local democratic structures that determine how power is exercised and that make local authorities accountable to citizens in their jurisdiction.</p> <p>[SOURCE: UCLG, GOLD I, 2008]</p>
<b>Disaster</b>	<p>Serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic, or environmental losses and impacts having occurred which exceed the ability of the affected organisation, community, or society to respond and recover using its own resources.</p> <p>[SOURCE: UNISDR, 2017 with modifications from ISO 22300:2018]</p>

<b>Disaster risk</b>	Possibility of loss and injury.
	NOTE: Disaster risk includes potential loss of life, disruption to lives and livelihoods (including injury, illness, danger, loss of sense of security or displacement), damage to or loss of property, and disruption of community activities which could occur to a system, a society, or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability, and/or capacity.
	[SOURCE: ISO/DIS 22327:2017 and UNISDR, 2017]
<b>Disaster risk assessment</b>	Qualitative or quantitative approach to determine the nature and extent of disaster risk by identifying and analysing potential hazards, and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods, and the environment on which they depend.
	[SOURCE: UNISDR, 2017 with modification]
<b>Disaster risk management</b>	Coordinated activities to direct and control an organisation with regard to disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk, and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.
	NOTE: Activities should encompass: Mitigation - the lessening or minimising of the adverse impacts of a hazardous event; and, Preparedness - the knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent, or current disasters.
	[SOURCE: UNISDR, 2017 with modification]
<b>Disaster risk reduction</b>	Aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and, therefore, to the achievement of sustainable development.
	[SOURCE: UNISDR, 2017]
<b>Drinking water</b>	All water either in its original state or after treatment, intended for drinking, cooking, food preparation, or other domestic purposes, regardless of its origin.
	NOTE 1: Safe drinking water is water with microbial, chemical and physical characteristics that meet WHO guidelines or national standards on drinking water quality.
	NOTE 2: Sources of drinking water include household connections, public standpipes, boreholes, protected and unprotected dug wells, protected and unprotected springs, rainwater collection and surface sources, such as river, dam, lake, pond, stream, canal, and irrigation channels.
	NOTE 3: Access to drinking water means that the drinking water source is less than one kilometre away from its place of use and that it is possible to reliably obtain at least twenty litres per member of a household per day.
	[SOURCE: ISO 5667-5:2006 (en), 2.2 with added notes to entry]



<b>Duty-bearers</b>	<p>Individuals who have a particular obligation or responsibility to respect, promote, and realise human rights and to abstain from human rights violations.</p> <p>NOTE 1: The term is most commonly used to refer to State actors, but non-State actors can also be considered duty-bearers.</p> <p>NOTE 2: Depending on the context, individuals (e.g. parents), local organisations, private companies, aid donors, and international institutions can also be duty-bearers.</p> <p>[SOURCE: UNICEF - Gender Equality, UN Coherence &amp; You]</p>
<b>Early warning system (EWS)</b>	<p>Integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems, and processes that enable individuals, communities, governments, businesses, and others to take timely action to reduce disaster risks in advance of hazardous events.</p> <p>[SOURCE: UNISDR, 2017]</p>
<b>Ecological footprint</b>	<p>A quantitative measure looking at how much of the available biologically productive land and water an individual, a population, or an activity requires to produce the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices. It is measured in standard units called global hectares.</p>
<b>Economic diversity</b>	<p>Extent to which economic activity of a given defined geography is distributed among a number of categories such as industries, sectors, skill levels, and employment levels.</p>
<b>Ecosystem</b>	<p>Dynamic complex of plant, animal, and microorganism communities and the non-living environment (e.g. soil, air, sunlight) interacting as a functioning unit of nature.</p> <p>NOTE: Everything that lives in an <b>ecosystem</b> is dependent on the other species and elements that are also part of that ecological community.</p> <p>[SOURCE: ISO 14055-1:2017(en), 3.1.1 with addition of Note]</p>
<b>Ecosystem services</b>	<p>Benefit people obtain from ecosystems.</p> <p>NOTE: These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, waste generation, and water quality and cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling.</p> <p>[SOURCE: ISO 14055-1:2017(en), 3.1.2 with addition of Note]</p>
<b>Governance</b>	<p>The enabling environment that requires adequate legal frameworks and efficient political, managerial, and administrative processes to enable the local government's response to the needs of citizens.</p> <p>[SOURCE: UN-Habitat]</p>

<b>Green infrastructure</b>	Strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services (3.28).
	NOTE 1: It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas.
	NOTE 2: Green Infrastructure is a tool for providing ecological, economic, and social benefits through natural solutions. It helps avoid relying on 'grey infrastructure' that is expensive to build when nature can provide cheaper, more durable alternatives.
	[SOURCE: 2016 European Commission. Environment]
<b>Greenhouse gas emission(s) (GHG)</b>	Total mass of a GHG released to the atmosphere over a specified period of time.
	NOTE 1: Greenhouse gases (GHGs) are long-lived gases in the atmosphere that absorb infra-red radiation which would otherwise escape to space absorbing the radiation contributes to rising surface temperatures.
	NOTE 2: There are six major GHGs: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs), and sulphur hexafluoride (SF <sub>6</sub> ).
	NOTE 3: GHGs remain in the atmosphere for long periods of time, ranging from months to millennia.
<b>Grievance redress mechanisms</b>	System by which queries or clarifications about the project are responded to, problems that arise out of implementation are resolved, and complaints and grievances are addressed.
<b>Gross Domestic Product (GDP)</b>	Measure of all final goods and services produced in the city within a certain period of time.
<b>Human rights</b>	Rights inherent to all human beings, whatever our nationality, place of residence, sex, national or ethnic origin, colour, religion, language, or any other status.
	NOTE 1: People are all equally entitled to human rights without discrimination.
	NOTE 2: Human rights are: interrelated, universal, and inalienable, interdependent and indivisible, equal and non-discriminatory, and both rights and obligations.
<b>Improved drinking water sources</b>	Sources that, by the nature of their design and construction, have the potential to deliver safe water.
	NOTE 1: It includes piped water, boreholes or tube-wells, protected dug wells, protected springs, rainwater, and packaged or delivered water.
	NOTE 2: In order to meet the criteria for a safely managed drinking water service, people must use an improved source meeting three criteria: it should be accessible on premises, water should be available when needed, and the water supplied should be free from contamination.
	[SOURCE: WHO-JMP-UNICEF, 2017]
<b>Inadequate structure</b>	Walls, ceilings, and floors built with materials, such as asbestos or zinc, or using techniques linked to the absence of appropriate know-how and maintenance, or loss of traditional knowledge based on experience.

<b>Inequality</b>	<p>State of not being equal, especially in status, rights, and opportunities.</p> <p>NOTE: Inequality can be measured economically (or monetarily), regarding living conditions, or based on rights and associated obligations (e.g. when people are not equal before the law, or when people have unequal political power).</p> <p>[SOURCE: UNDP, 2015]</p>
<b>Indicator</b>	<p>An indicator refers to a unit of measurement of the urban system and consists of a collection of Supporting Indicators and Related Questions. Each Component is composed of a small number of Indicators.</p>
<b>Inflation</b>	<p>Sustained increase in general price levels for all goods and services in an economy over time.</p> <p>NOTE: Inflation describes an erosion of the purchasing power of a unit of currency. It is usually expressed as an annual percentage rate of change on an index number.</p>
<b>Informal business</b>	<p>Unincorporated small or unregistered enterprises or productive units.</p> <p>NOTE 1: A productive unit is a formal or informal organisation that provides goods and/or services to the market.</p> <p>NOTE 2: An informal business is neither taxed nor formally monitored by any form of government.</p>
<b>Informal sector</b>	<p>Private unincorporated enterprises that are unregistered or small in terms of the number of employed persons (e.g. less than five employees).</p> <p>NOTE 1: An enterprise is unincorporated if it is not constituted as a separate legal entity, independently of its owner(s), and does not maintain a complete set of accounts.</p> <p>NOTE 2: Units engaged in the production of goods or services exclusively for own final use by the household are excluded from the informal sector, as are enterprises engaged in agriculture, hunting, forestry, and fishing.</p>
<b>Investment</b>	<p>Allocation of resources to achieve defined objectives and other benefits.</p> <p>NOTE: Investment takes two main forms: direct spending on buildings, machinery and similar assets, and indirect spending on financial securities, such as bonds and shares.</p> <p>[SOURCE: The Economist, 2017; ISO/IEC 38500:2015(en), 2.13]</p>
<b>Land consumption</b>	<p>Expansion of built-up area which can be directly measured; absolute extent of land that is subject to exploitation by agriculture, forestry, or other economic activities; and over-intensive exploitation of land that is used for agriculture and forestry.</p> <p>[SOURCE: EEA. 1997]</p>
<b>Land tenure</b>	<p>Relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land, determining how land is used, possessed, sold, or in other ways disposed.</p>
<b>Local public debt</b>	<p>Gross debt of the local public organisation under the following liabilities: 1) currency and deposits; 2) debt securities (bonds); 3) loans; 4) insurance pensions and standardised guarantees; and 5) other accounts payable (commercial debt, arrears).</p>

<b>Municipal solid waste (MSW)</b>	<p>Waste stream consisting of end-of-life-materials consisting mainly of waste generated by households but may also include similar wastes generated by commerce and trade, small businesses, office buildings, and institutions (schools, hospitals, government buildings), and collected by or on behalf of municipal authorities.</p> <p>NOTE: The term 'municipal' is used in different ways from municipality to municipality and from country to country, reflecting different waste management practices.</p> <p>[SOURCE: Eurostat, 2017 as modified by ISO 16559:2014(en), 4.134]</p>
<b>Natural protected area (NPA)</b>	<p>Clearly defined geographical space, recognised, dedicated, and managed through legal means or other types of efficient means to achieve the long-term conservation of nature with associated <i>ecosystem services</i> (3.28) and cultural values.</p> <p>[SOURCE: ISO 18065:2015(en), 3.6]</p>
<b>Open access</b>	<p>Specific rights are not assigned to anyone and no one can be excluded.</p>
<b>Open area</b>	<p>All the vacant areas - public or private - within the urban footprint.</p> <p>NOTE: Urbanised open areas are all fringe open space and captured open space pixels associated with the urban extent.</p>
<b>Open data</b>	<p>Publicly available data (preferably online) disseminated in a user-friendly way (metadata and machine-readable format) which is reusable and license free for distribution and publication.</p> <p>NOTE: It must also be universally accessible.</p>
<b>Own-source revenue</b>	<p>All governmental revenues that are raised directly by the municipality</p> <p>NOTE: Common <i>own-source revenues</i> include property/land taxes, fees, and charges for services and permits, locally imposed sales, use or income taxes, <i>investment</i> (3.45) or rental income generated from city assets, among others.</p>
<b>Para-transit</b>	<p>Transport services that are available to be shared, without prior arrangement, by the general public.</p> <p>NOTE 1: Para-transit, however, is not considered as a part of the traditional public transport regulatory system.</p> <p>NOTE 2: Para-transit, in general, has the following characteristics: Services are usually unscheduled and often, though not always, are on demand-responsive routes; and, The vehicles operated are typically small, including motorcycles and mini-buses.</p> <p>NOTE 3: Para-transit services are usually provided by informal operators with the following characteristics: They are "non-corporate," usually operating as single-person enterprises; and, They are often outside the tax system or benefit from favourable treatment of the non-corporate sector.</p> <p>[SOURCE: Roy, E. L., Rosemary, G. M, Transportation Engineering and Planning, Paratransit Systems, 2009]</p>

<b>Participation</b>	<p>Informed process of engagement with stakeholders, where key groups actively participate in defining the process and content of policy making.</p> <p>[SOURCE: UNISDR, 2017 and ISO 22300:2018 (en), 3.187]</p>
<b>Poverty</b>	<p>State or condition of having little or no money/goods/means of support.</p>
<b>Preparedness</b>	<p>Activities, programmes, and systems developed and implemented prior to an incident that can be used to support and enhance prevention, protection from, mitigation of, response to, and recovery from disruptions, emergencies, or disasters.</p> <p>[SOURCE: ISO 22300:2018 (en), 3.172]</p>
<b>Private modes of transport</b>	<p>Transportation means that are not available for the general public, as they are not shared by strangers without prior arrangement.</p>
<b>Private sector</b>	<p>For-profit enterprises, companies or businesses, regardless of size, ownership, and structure.</p> <p>NOTE: It covers all economic sectors and economic activities, ranging from local farmer organisations, cooperatives and small and medium enterprises to large international corporations. It includes private financial institutions, industry and trade associations, and consortia and coalitions that represent private sector interests (e.g., cross-industry multi-issue groups, cross industry issue-specific initiatives, industry-focused initiatives).</p>
<b>Pro-poor land administration</b>	<p>Inclusive system that extends land rights to all and recognizes all rights existing in a continuum.</p> <p>NOTE: It implies that a new, streamlined, affordable form of land recordings must be developed to record these different types of rights and link them to existing deeds and title systems.</p>
<b>Product share</b>	<p>Proportion of the overall market (defined in terms of either units or revenue) accounted for by a specific product.</p>
<b>Public open space</b>	<p>Areas within the urban footprint that are accessible for public use.</p> <p>NOTE 1: These are delimited by local planning.</p> <p>NOTE 2: Public open spaces encompass open air, outdoor areas in the city that are accessible by the public for recreational use, e.g. public parks, squares, recreational green areas, public playgrounds and widened pedestrian areas. It does not include streets, unless the city specifically indicates them as recreational space, nor areas devoted to public facilities that are not open to the general public.</p>
<b>Public modes of transport</b>	<p>Shared passenger transport services that are available to the general public and are shared by strangers without prior arrangement.</p> <p>NOTE: It ideally has well designed 'stops' and demarcated 'routes' that are both officially and/or formally recognised.</p> <p>[SOURCE: UN-HABITAT, Unpublished manuscript, 2016]</p>

<b>Recovery</b>	<p>Restoration and improvement, where appropriate, of livelihoods and health, as well as economic, physical, social, cultural, and environmental assets, systems, and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.</p> <p>[UNISDR, 2017 and ISO 22300:2018 (en), 3.187]</p>
<b>Related Question</b>	<p>Related Questions are structured similarly to Supporting Indicators, but the data collected are of secondary importance and generally not subject to a benchmarking process.</p>
<b>Resilience</b>	<p>Ability to absorb and adapt in a changing environment.</p> <p>NOTE: In the context of urban resilience the ability to absorb and adapt to a changing environment is determined by the collective capacity to anticipate, prepare, and respond to threats and opportunities by each individual component of an urban system.</p> <p>[SOURCE: ISO 22300:2018 (en)]</p>
<b>Rights-holders</b>	<p>Individuals or social groups that have particular entitlements in relation to specific duty-bearers.</p> <p>NOTE: All human beings are rights-holders under the Universal Declaration of Human Rights. A human rights-based approach does not only recognize that the entitlements of rights-holders need to be respected, protected, and fulfilled, but it also considers rights-holders as active agents in the realisation of human rights and development, both directly and through organisations representing their interests.</p> <p>[SOURCE: UNICEF, Gender Equality, UN Coherence &amp; You]</p>
<b>Risk mitigation</b>	<p>Lessening or minimizing of the adverse impacts of a hazardous event.</p> <p>[SOURCE: UNISDR, 2017]</p>
<b>Shocks</b>	<p>Uncertain, abrupt, or long-onset events that have potential to impact upon the purpose or objective of an urban system.</p>
<b>Social accountability</b>	<p>Approach to governance that involves citizens and civil society organisations in public decision making.</p>
<b>Social protection</b>	<p>Preventing, managing, and overcoming situations that adversely affect people’s well-being.</p> <p>NOTE: It consists of policies and programmes designed to reduce poverty and vulnerability by promoting efficient labour markets, diminishing people’s exposure to risks, and enhancing their capacity to manage economic and social risks, such as unemployment, exclusion, sickness, disability, and old age.</p> <p>[SOURCE: UNISDR]</p>
<b>Social protection floor (SPF)</b>	<p>Nationally defined sets of basic social security guarantees that should ensure, as a minimum that, over a life cycle, all in need have access to essential health care and to basic income security which together secure effective access to goods and services defined as necessary at the national level.</p>

<b>Stakeholder</b>	<p>Person or organisation that can affect, be affected by, or perceive itself to be affected by a decision or activity.</p> <p>NOTE: Stakeholders may include government entities, private sector, civil society, academia, and other major institutions from the local to the international level operating in the city.</p> <p>[SOURCE: ISO 9000:2015, 3.2.3 and ISO 22300:2018 (en), 3.124]</p>
<b>Stresses</b>	<p>Chronic and ongoing dynamic pressures originated within an urban system with potential for cumulative impacts on the ability and capacity of the system to achieve its objectives.</p>
<b>Stressor</b>	<p>Factors, processes, activities or interactions that individually or conjointly lead to the generation of a stress in the urban system.</p>
<b>Supply chains</b>	<p>Two-way relationships of organisations and/or people with processes, logistics, information, technology, and resources engaging in activities and creating value from the sourcing of materials through the delivery of products or services.</p> <p>NOTE 1: The supply chain may include vendors, subcontractors, manufacturing facilities, logistics providers, internal distribution centres, distributors, wholesalers, and other entities that lead to the end user.</p> <p>[SOURCE: ISO 22300:2018 (en) 3.251]</p>
<b>Supporting Indicator</b>	<p>A Supporting Indicator is the principal data collection unit for the City Resilience Profiling Tool (CRPT), consisting of a question or group of questions requiring a quantitative and/or qualitative response. The majority of data generated by Supporting Indicators are benchmarkable or quantitatively measurable.</p>
<b>Sustainable modes of transport</b>	<p>Transport that has zero or minimum effect on the environment due to the use of sustainable or regenerated energy.</p>
<b>Trade balance</b>	<p>Measure of how a given entity's (city, region, country, etc.) total imports by value compare to its total exports by value.</p> <p>NOTE 1: An excess of imports over exports is referred to as a trade deficit while an excess of exports over imports is described as a trade surplus.</p>
<b>Urban</b>	<p>Any town, city, or other human settlement.</p>
<b>Urban agglomeration</b>	<p>The physical structure and composition of an urban area or continuity of large urban clusters where the built-up zone or population density of an extended city or town area or central place and any suburbs are linked by continuous, connected urban development.</p>
<b>Urban footprint</b>	<p>Built-up area, the fringe open land, and the captured open land.</p>

**Urban green space**

Urban space covered by vegetation of any kind.

NOTE 1: This includes:

1. smaller green space features (such as street trees and roadside vegetation);
2. green spaces not available for public access or recreational use (such as green roofs and facades, or green space on private grounds); and
3. larger green spaces that provide various social and recreational functions (such as parks, playgrounds, or greenways).

[SOURCE: 2017. Urban Green Space interventions and health. World Health Organisation. Regional Office for Europe]

**Urban open area**

All the vacant areas – public or private – within the urban boundaries.

NOTE 1: Urban open areas are all fringe open space and captured open space associated within the scope and parameters of the urban system.

NOTE 2: State, national parks, or open areas in the countryside outside the parameters of the urban area are not considered, here, as urban open areas.

**Urban resilience**

Ability of any urban system, with its inhabitants, in a changing environment, to anticipate, prepare, respond to, and absorb shocks, positively adapt and transform in the face of stresses and challenges, while facilitating inclusive and sustainable development.

NOTE 1: A more resilient urban system is characterised by its ability to continue through disruption in the short-to-medium term, combined with a capacity to reduce pressures and adapt to changes, risks and opportunities. Urban resilience therefore is dependent upon not just the ability of an urban system to deal with shocks, but also with chronic stresses and challenges.

NOTE 2: Urban resilience is dependent upon the individual and collective resilience of the separate components of a complex urban system. Although a city, town, or community within an urban area may individually demonstrate enhanced resilience within their respective boundaries, urban resilience encompasses the broader geographic scope of urban agglomeration. Resilience of an urban system is measured by the capacity of resilience for each individual system component and dependent upon the resilience of the weakest performer among the urban agglomeration within the system scope.

NOTE 3: In order to assess, plan and act accordingly in the face of shocks, stresses, and challenges, an urban system's capability for resilience should be measured and analysed through qualitative and quantitative data.

**Waste picker**

Persons who collect household, commercial, and industrial waste.

NOTE 1: They may collect from private waste bins on the curb or from dumpsters, along the streets and waterways or on municipal dumps and landfills.

NOTE 2: They salvage reusable or recyclable materials thrown away by others to sell or for personal consumptions.

NOTE 3: Waste pickers include those formally contracted by municipalities and private entities, but also all of those working informally.





**Executive Summary**

**Glossary**

**Introduction**

**Appendices**

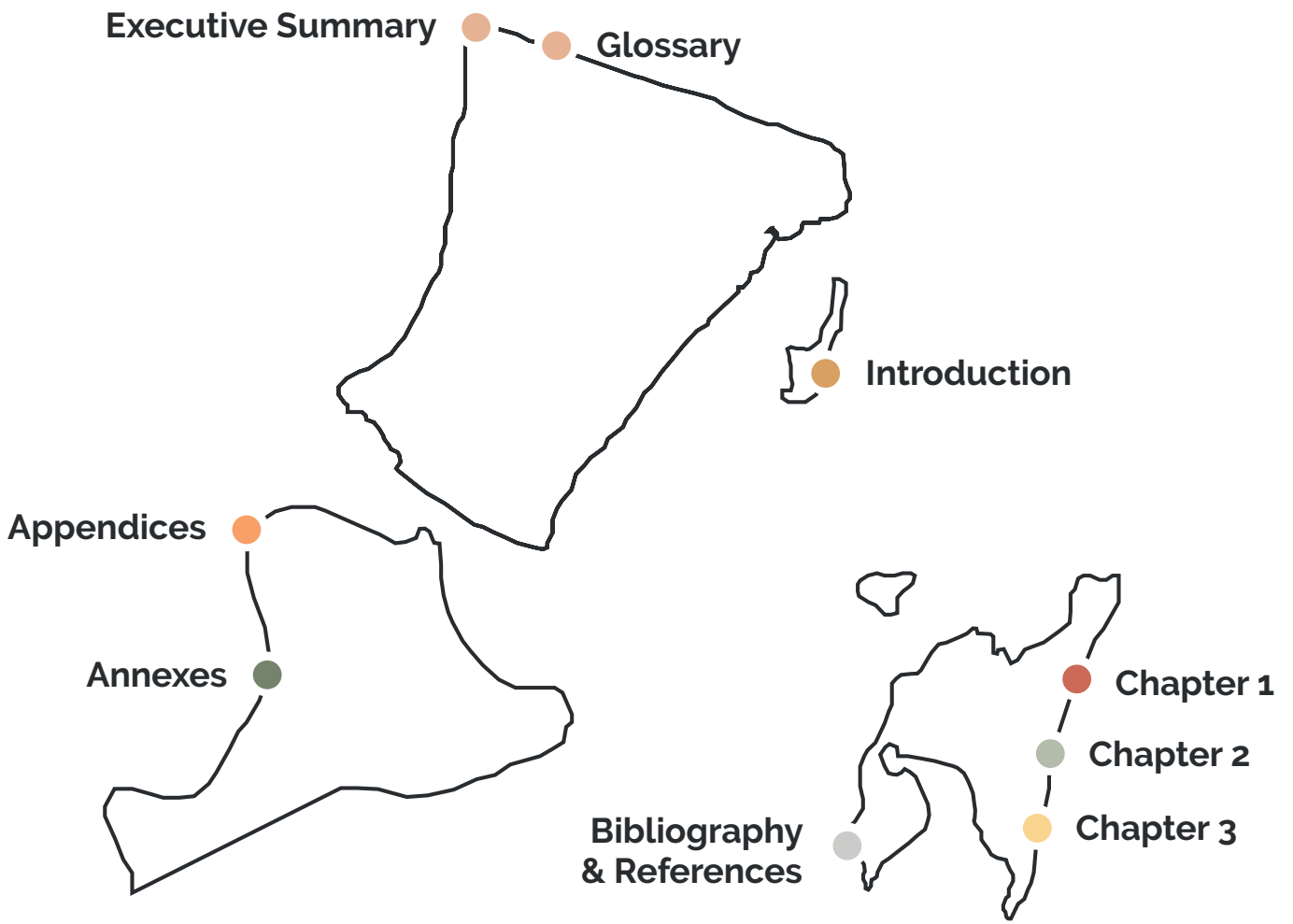
**Annexes**

**Bibliography  
& References**

**Chapter 1**

**Chapter 2**

**Chapter 3**





# Contents

---

- **58 Introduction**
  - 61** CRPP: Main concepts
  - 63** CRPP: Methodology and alignment with the international Agenda 2030
  - 66** CRPP: Actions for Building Resilience
  - 68** CRPP: Implementation Process in Maputo
  
- **70 Chapter 1: Current Scenario**
  - 73** 1.1. Context of the city of Maputo
  - 76** 1.2. Construction of the Current Scenario
  - 80** 1.3. Identification, prioritisation and description of Stressors in Maputo
  - 101** 1.4. The Current Scenario in context
  
- **106 Chapter 2: Trend Scenario**
  - 108** 2.1. Construction of the Trend Scenario
  - 111** 2.2. Relationship of Stresses (and Stressors) to installed capacities and the existing legal framework
  - 120** 2.3. Transversal lines of action in the Actions for Resilience
  
- **122 Chapter 3: Resilient and Sustainable Scenario: Actions For Resilience**
  - 124** 3.1. Definition of Actions for Resilience conditions
  - 128** 3.2. Actions for Resilience: definition and structure of actions: types of implementation
  - 129** 3.3. Prioritisation Actions for Resilience: lines of actions and conditions
  - 142** 3.4. Actions for Resilience: integrative actions: comprehensive, integral, and direct
  - 146** 3.5. Conclusions
  
- **148 Bibliography and References**

●	<b>152</b>	<b>Annexes</b>
	<b>154</b>	<b>Annex I:</b> CRPP Implementation Process in Maputo
	<b>170</b>	<b>Annex II:</b> City Characterisation
	<b>182</b>	<b>Annex III:</b> Urban Elements Performance Overview
	<b>224</b>	<b>Annex IV:</b> Shocks Analysis
	<b>250</b>	<b>Annex V:</b> Key Messages: Climate Change
	<b>274</b>	<b>Annex VI:</b> Local Government and Stakeholders Analysis
	<b>300</b>	<b>Annex VII:</b> Urban Resilience Unit Terms of Reference Maputo City Council
●	<b>306</b>	<b>Appendices</b>
	<b>308</b>	<b>Appendix 1:</b> Current Scenario: identification of stresses and stressors in Maputo
	<b>326</b>	<b>Appendix 2:</b> Current Scenario: selection of indicators and their relation to shocks and stresses in Maputo
	<b>344</b>	<b>Appendix 3:</b> List of Shocks, Stresses and Stressors
	<b>366</b>	<b>Appendix 4:</b> List of Stakeholders
	<b>386</b>	<b>Appendix 5:</b> List of Policies, Plans and Initiatives

## List of figures

---

- Figure 1** CRPP Implementation Process Diagram. Source: CRPP (2018).
- Figure 2** Timeline of CRPP Implementation in Maputo. Source: CRPP (2019).
- Figure 3** Location of Maputo. Source: CRPP based on Google Maps information (2019).
- Figure 4** Territorial map showing administrative boundaries of Maputo. Source: CRPP (2019) with information from the CRPT data collection process.
- Figure 5** Visualisation of results after data collection and resilience assessment. Source: CRPT (2019).
- Figure 6** Priority Shocks in Maputo. Source: CRPT (2019).
- Figure 7** Current Scenario of Maputo. Resilience assessment using certain indicators, by color. Stress identification from the study of Urban Elements. Source: CRPP (2019).
- Figure 8** Relationship of negative performance of CRPT indicators and the generation of stressors by each respective stress. Source: Prepared by CRPP (2019) with information from the CRPT data collection process.
- Figure 9** Rapid urbanisation without regulation. Source: CRPT (2019).
- Figure 10** Urban footprint growth in Maputo. Source: *Evolução e tendências regidas pelas mudanças históricas, contextos e actores implicados nos bairros suburbanos e periurbanos: o caso de Maputo.* Arwen Prendergast (2011).
- Figure 11** Socioeconomic inequality. Source: CRPT (2019).
- Figure 12** Inefficient management of urban metabolism. Source: CRPT (2019).
- Figure 13** Water cycle. Source: CRPP (2019).
- Figure 14** Location of WWTP in the city. In relation to the Infulene River Valley (garden area) Detail of the infrastructure. Source: CRPP based on information provided by google maps (2019).
- Figure 15** Sanitation map of Maputo. Source: CRPP based on information provided by PEUMM 2008 (2019).
- Figure 16** Solid waste cycle. Source: CRPP (2019).
- Figure 17** Location of the Hulene Dumpster in Maputo. To the right, a close-up of the Dumpster surrounded by residences at an unsafe distance). Source: CRPP based on information provided by google maps (2019).
- Figure 18** Evolution of land use in Maputo from 1964 to 2008. Source: CRPP based on information provided by "Maputo, cinco décadas de mudança territorial. Cristina Delgado Henriques. Editora: IPAD (Instituto Português de Apoio ao Desenvolvimento).
- Figure 19** Evolution of land use in Maputo from 1964 to 2008. Source: CRPP based on information provided by "Maputo, cinco décadas de mudança territorial. Cristina Delgado Henriques. Editora: IPAD (Instituto Português de Apoio ao Desenvolvimento).
- Figure 20** Conclusions of the Current Scenario (stresses and shocks). Source: CRPP (2019).

## List of figures

---

- Figure 21** Mobility as an Urban Element and its relationship to identified stressors as well as to prioritised shocks. Relating Mobility to the stresses/stressors and shocks that directly affect it, which in turn influence others. Source: CRPT (2019).
- Figure 22** Mobility as an Urban Element and its relationship to identified stressors as well as to prioritised shocks. Relating Mobility to the stresses/stressors and shocks that directly affect it, which in turn influence others. Source: CRPT (2019).
- Figure 23** Areas prone to flooding (blue) overlapping the main critical rainwater drainage areas (dashed in red). Source: CRPP based on information provided by PEUMM 2008 (2019).
- Figure 24** Linking shocks and stresses with other constraints or areas of opportunity. Source: CRPT (2019).
- Figure 25** Process of building a Resilient and Sustainable Scenario. Source: CRPP (2019).
- Figure 26** Resilience and emergency. Source: CRPP (2019).
- Figure 27** Summary of the three flows. Source: Collected in the Urban Solid Waste Master Plan (2018).
- Figure 28** Lines of Action. Source: CRPP (2019).
- Figure 29** Participation and accountability of all actors. Source: Presentation by CRPP in Maputo City (2019).
- Figure 30** Figure Example of an action addressing Urban Informality. Source: Projecto HABITAT, ASF-CMM (2018-2019).
- Figure 31** Process promoted under the ASF-CMM initiative. Source: Projecto HABITAT, ASF-CMM (2018-2019).
- Figure 32** Process promoted under the ASF-CMM initiative. Source: Projecto HABITAT, ASF-CMM (2018-2019).
- Figure 33** Example of an action addressing Urban Transport and Mobility. Source: CRPT (2019).
- Figure 34** Example of an action addressing Urban Metabolism Management. Source: CRPT (2019).
- Figure 35** Example of an action addressing the Management and Recovery of Major Ecosystems. Source: CRPT (2019).
- Figure 36** A4R. Revitalisation of the Municipal Archive. Source: CRPP (2019).
- Figure 37** A4R. Revision of the Urban Structure Plan (PEUMM). Source: CRPP (2019).
- Figure 38** A4R. Creation of a Resilience Unit (UR). Source: CRPP (2019).

## List of tables

---

<b>Table 1</b>	Key information about Maputo. Source: Prepared by CRPP (2019) with information from the CRPT data collection process.
----------------	---

## Lista de imagens

---

<b>Image 1</b>	Aerial view of Munhuana's neighbourhood. Source: Roteiro Histórico de Maputo, Sopa and Rungo (2005).
<b>Image 2</b>	Brick houses T-1, T-2 e T-3. Source: Roteiro Histórico de Maputo, Sopa and Rungo (2005).
<b>Image 3</b>	Moments of community building of the communal villages (end 70-80) Source: Arquivo fotográfico do Conselho Municipal de Maputo.
<b>Image 4</b>	Moments of community building of the communal villages (end 70-80) Source: Arquivo fotográfico do Conselho Municipal de Maputo.
<b>Image 5</b>	Tchapa in Maputo. Source: Google images (2019).
<b>Image 6</b>	Mylove in Maputo. Source: Google images (2019).
<b>Image 7</b>	Example of flooded streets in peripheral neighbourhoods. Source: CRPP (2019)
<b>Image 8</b>	Example of cars parked on sidewalks, preventing pedestrian traffic and endangering their safety. Source: CRPP (2019).
<b>Image 9</b>	Plan of the City of Lourenço Marques in 1940. From the dashed area downwards, the cement city. Source: Maputo, patrimonio da estrutura e forma urbana., de João Sousa Morais (2001).
<b>Image 10</b>	Building in "cement city." Source: CRPP (2019).
<b>Image 11</b>	Wood and zinc house from the urban periphery. Source: CRPP (2019).
<b>Image 12</b>	Example of integrated water tanks in buildings (in the "cement city" and periphery). Source: CRPP (2019).
<b>Image 13</b>	Contaminated garbage (car oil) in a peripheral neighbourhood, without proper treatment or storage system - ground filtration and contamination. Source: CRPP (2019).
<b>Image 14</b>	Earthworks for the construction of the descent road to Baix. Source: Maputo Municipal Council Photographic Archive.
<b>Image 15</b>	Photograph showing natural vegetation as a grounding element. Source: <a href="http://www.delagoabayworld.wordpress.com">www.delagoabayworld.wordpress.com</a>
<b>Image 16</b>	Urban gardens in the Infulene Valley. Source: google images.
<b>Image 17</b>	Example of CMM's support for a CSOs' beach clean-up initiative. Source: google images.
<b>Image 18</b>	Av. Marginal before (left) and after (right) CMM intervention. Source: google images.
<b>Image 19</b>	Av. Marginal before (left) and after (right) CMM intervention. Source: google images.



## List of images

---

- Image 20** Vegetation elements that not only prevent car parking, but also improve aesthetics and atmosphere. Source: CRPP (2019).
- Image 21** Vegetal elements built out of recycled material, initiative of the neighbors. Source: CRPP (2019).
- Image 22** Physical elements, allowing the coexistence between pedestrians and cars. Source: CRPP (2019).
- Image 23** CMM facilities in Jardim Tunduru: the compost depot and attached nurseries. Source: CRPP (2019).
- Image 24** CMM facilities in Jardim Tunduru: the compost depot and attached nurseries. Source: CRPP (2019).
- Image 25** CMM facilities in Jardim Tunduru: the compost depot and attached nurseries. Source: CRPP (2019).
- Image 26** CMM facilities in Jardim Tunduru: the compost depot and attached nurseries. Source: CRPP (2019).

## List of acronyms and abbreviations

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<b>A4R</b>	Actions for Resilience
<b>AdeM</b>	Water for the Region of Maputo
<b>AECID</b>	Spanish Agency for International Cooperation for Development
<b>AfDB</b>	African Development Bank
<b>AMB</b>	Barcelona Metropolitan Agency
<b>AMT</b>	Metropolitan Transportation Agency
<b>AP</b>	Associations of Producers
<b>ARA-Sul</b>	Mozambique Regional Administration of Waters in the South
<b>BEN</b>	Built Environment
<b>BIN</b>	Basic Infrastructure
<b>CENOE</b>	National Emergency Operations Center
<b>CERUM</b>	Multiple Uses and Resources Centers
<b>CMM</b>	Maputo Municipality
<b>CRPP</b>	City Resilience Profiling Programme
<b>CRPT</b>	City Resilience Profiling Tool
<b>CSO</b>	Civil Society Organisations
<b>DFID</b>	United Kingdom Department for International Development
<b>DRR</b>	Disaster Risk Reduction
<b>DUAT</b>	Right of Use and Land Use
<b>EC</b>	European Commission
<b>ECL</b>	Ecology
<b>ECN</b>	Economy
<b>EDM</b>	Electricity of Mozambique
<b>ESKOM</b>	Electricity Supply Commission
<b>EU</b>	European Union
<b>EWS</b>	Early Warning System
<b>FAO</b>	Food and Agriculture Organisation
<b>FFH</b>	Fund for Housing Development
<b>FIPAG</b>	Investment Fund and Heritage of Water Supply

## List of acronyms and abbreviations

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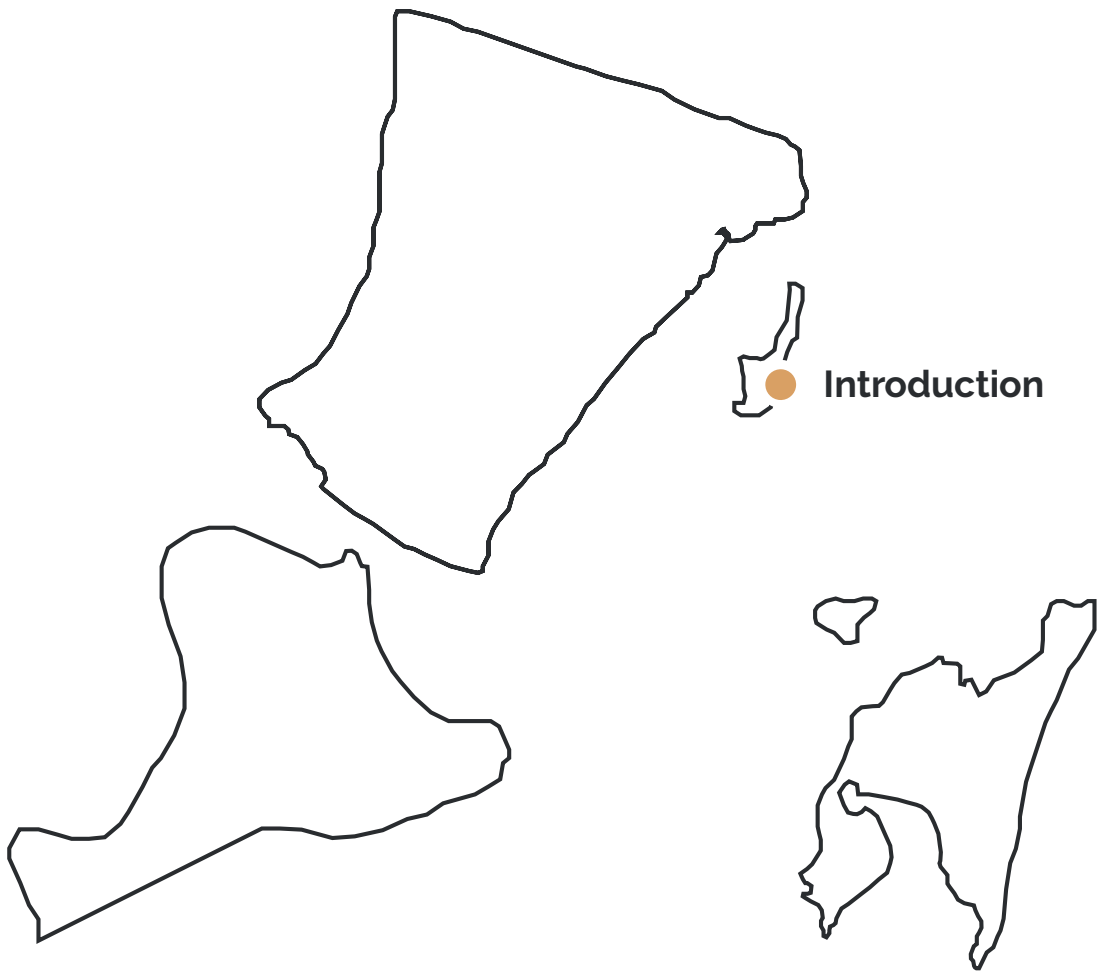
<b>GDP</b>	Gross Domestic Product
<b>GIS</b>	Geographic Information System
<b>GIZ</b>	Gesellschaft für Internationale Zusammenarbeit
<b>HCB</b>	Hydroelectric of Cahora Bassa
<b>HIV</b>	Human Immunodeficiency Viruses
<b>IACM</b>	Mozambican Civil Aviation Institute
<b>ICLEI</b>	Local Governments for Sustainability
<b>IGRAC</b>	International Groundwater Resource Assessment Centre
<b>INAE</b>	National Inspection of Economic Activities
<b>INAM</b>	National Institute of Meteorology
<b>INAM</b>	National Institute of Meteorology
<b>INGC</b>	National Institute of Disaster Management
<b>JICA</b>	Japan International Cooperation Agency
<b>MAEFP</b>	Ministry of State Administration and Public Functions
<b>MEF</b>	Ministry of Economy and Finance
<b>MINEDH</b>	Ministry of Education and Human Development
<b>MISAU</b>	Ministry of Health
<b>MITADER</b>	Ministry of Land, Environment and Rural Development
<b>MOB</b>	Mobility
<b>MOPHRH</b>	Ministry of Public Works, Housing and Water Resources
<b>MOU</b>	Memorandum of Understanding
<b>MTA</b>	Maputo Metropolitan Transport Agency
<b>MZN</b>	Mozambican metical
<b>NGO</b>	Non-governmental Organization
<b>PARPA</b>	Action Plan for Extreme Poverty Reduction
<b>PDRP</b>	Pre-Disaster Recovery Planning
<b>PDRRD</b>	Master Plan for Disaster Risk Reduction
<b>PEUMM</b>	Urban Master Plan of Maputo Municipality
<b>PM10</b>	Particulate Matter 10
<b>PNCM</b>	Ministry of Health through the National Malaria Control Program.

## List of acronyms and abbreviations

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<b>RAR -S</b>	Recommendations of Actions for Resilience and Sustainability
<b>RR</b>	Risk Reduction
<b>SADC</b>	South African Development Community
<b>SCL</b>	Supply Chain and Logistics
<b>SENSAP</b>	National Service of Public Safety
<b>SI</b>	Supporting Indicators
<b>SIDA</b>	Swedish International Development Cooperation Agency
<b>SIP</b>	Social Inclusion and Protection element
<b>SOP</b>	Standard Operation Procedures
<b>TDM</b>	Telecommunications of Mozambique
<b>TPM</b>	Public Transportation of Maputo
<b>UN-Habitat</b>	United Nations Human Settlements Programme
<b>UN / ONU</b>	United Nations
<b>UNAPROC</b>	National Civil Protection Units
<b>UNDP</b>	United Nations Development Programme
<b>UNDRR</b>	United Nations Office for Disaster Risk Reduction
<b>WHO</b>	World Health Organization
<b>WB</b>	World Bank / Banco Mundial
<b>WFP</b>	World Food Programme





# Introduction





# Introduction

As a pilot city of the “Making Cities Sustainable and Resilient” (MCRS) project, UN-Habitat has been working closely with the Municipality of Maputo over the past two years to create a comprehensive profile of the city and recommend actions to improve its resilience through the City Resilience Profiling Programme (CRPP) and its associated City Resilience Profiling Tool (CRPT). CRPP is grateful to the Maputo Local Government for its commitment to work as a pilot city of the MCRS project. While various initiatives focusing on different aspects of risk reduction and resilience have been previously conducted in Maputo, the municipality has openly accepted the implementation of the CRPT for its transversal approach that can lead to innovations in integrated resilience building among different sectors at the city level.

The CRPP provides a universal framework that utilises verifiable and contextualized city data to establish its resilience profile and form an analysis and diagnosis of its most pressing challenges. This profile and diagnosis provide a base for the creation of evidence-based and implementable Recommended Actions for Resilience (A4R) that are then incorporated into urban development strategies and existing management processes. This process is designed to support the local government to take an informed decision-making approach and in turn support long-term, resilient and sustainable urban development, in the Municipality of Maputo.

The Recommendations of Actions for Resilience and Sustainability Report (RAR-S) presents a culmination of the work conducted as part of implementing the CRPP in each pilot city. To both orient the reader and provide a truncated overview of the analytical process by which Actions for Resilience are developed, this chapter briefly presents the CRPP methodology. Description of the methodology is by no means exhaustive, but rather serves as a primer for the analytical findings presented in subsequent chapters. In other words, while the RAR-S report seeks to summarise the multifaceted implementation process, analytical and diagnostic efforts, and development of concrete recommendations for actions for building resilience in the pilot cities, it does not seek to provide detail for neither the methodological basis from which the CRPP was developed, nor the analytical process in its entirety given its extensiveness.

Building upon this brief methodological overview, this chapter provides an explanation of the scope and depth of analysis that is explored herein.

## CRPP: Main Concepts

UN-Habitat’s flagship tool for urban resilience, the City Resilience Profiling Tool (CRPT), provides a cross-cutting diagnostic and action-oriented approach for resilience-based sustainable urban development. Its methodology is based on UN-Habitat’s definition of urban resilience, shown below, which encompasses a theoretical approach followed by a more practical description on what resilience-building efforts entail and target.

These definitions and understandings are important for cities implementing the CRPT and their collaborative partners as they outline the overall objective for the city. Without a shared understanding, catalyzing engagement of stakeholders and garnering buy-in from partners is challenging.

In addition to these definitions, the following Urban Resilience Principles were developed to guide the process of achieving urban resilience in cities. Note that these principles are embedded within the structure, design, and implementation approach of the CRPP.

**Urban resilience is the measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability.**

**A resilient city assesses, plans and acts to prepare for and respond to hazards – natural and human-made, sudden and slow-onset, expected and unexpected – in order to protect and enhance people’s lives, secure development gains, foster an investable environment, and drive positive change.**



### **Principle 1** Dynamic nature of urban resilience

Resilience is not a condition but a state that cannot be sustained unless the system evolves, transforms and adapts to current and future circumstances and changes. Therefore, building resilience requires the implementation of context-specific and flexible plans and actions that can be adjusted to the dynamic nature of risk and resilience.



### **Principle 2** Systemic approach to cities

Recognising that cities are comprised of systems interconnected through complex networks and that changes in one part have the potential to propagate through the whole network, building resilience requires a broad and holistic approach that takes into account these interdependencies when the urban system is exposed to disturbances.



### **Principle 3** Promote participation in planning and governance

A resilient system ensures the preservation of life, limitation of injury, and enhancement of the 'prosperity' of its inhabitants by promoting inclusiveness and fostering comprehensive and meaningful participation of all, particularly those in vulnerable situations, in planning and various governance processes. Such an approach can ensure sense of ownership, thus achieving successful implementation of plans and actions.



### **Principle 4** Multi-stakeholder engagement

A resilient system should ensure the continuity of governance, economy, commerce and other functions and flows upon which its inhabitants rely. This necessitates promoting open communication and facilitating integrative collaborations between a broad array of stakeholders ranging from public entities, private sector, civil society, and academia to all city's inhabitants.



### **Principle 5** Strive towards development goals

Resilience building should drive towards, safeguard and sustain development goals. Approaches to resilience should ensure that efforts to reduce risk and alleviate certain vulnerabilities does not generate or increase others. It must guarantee that human rights are fulfilled, respected and protected of under any circumstances.

# CRPP: Methodology and Alignment with International Agenda 2030

The implementation of the CRPP is characterized by four overlapping steps: 1) data collection, 2) analysis, 3) diagnosis, and 4) recommendations for actions for resilience.

In order to better understand how the data collected leads to derived actions, clarity regarding how these key implementation processes are pursued and relate to one another is required. The implementation process is discussed briefly in the section below.

To facilitate the data collection and analysis steps, the CRPT is structured in four SETs. Each SET serves a specific focus, through which information covering the entire urban system are mapped, analysed and inter-related. Data analysed throughout these SETs, and subsequently presented in this report, are derived from existing databases, official documents, research and publications, among other verifiable sources. While much of these data provide quantitative information to conduct evidence-based analysis of the city, findings are complemented by a qualitative sources gathered through workshops, expert readings, etc., in an attempt to capture the city's nuances and contextual realities. Together, quantitative and qualitative data collection and analysis lead to an in-depth diagnosis of the city, thereby providing a base for the development of Actions for Resilience.

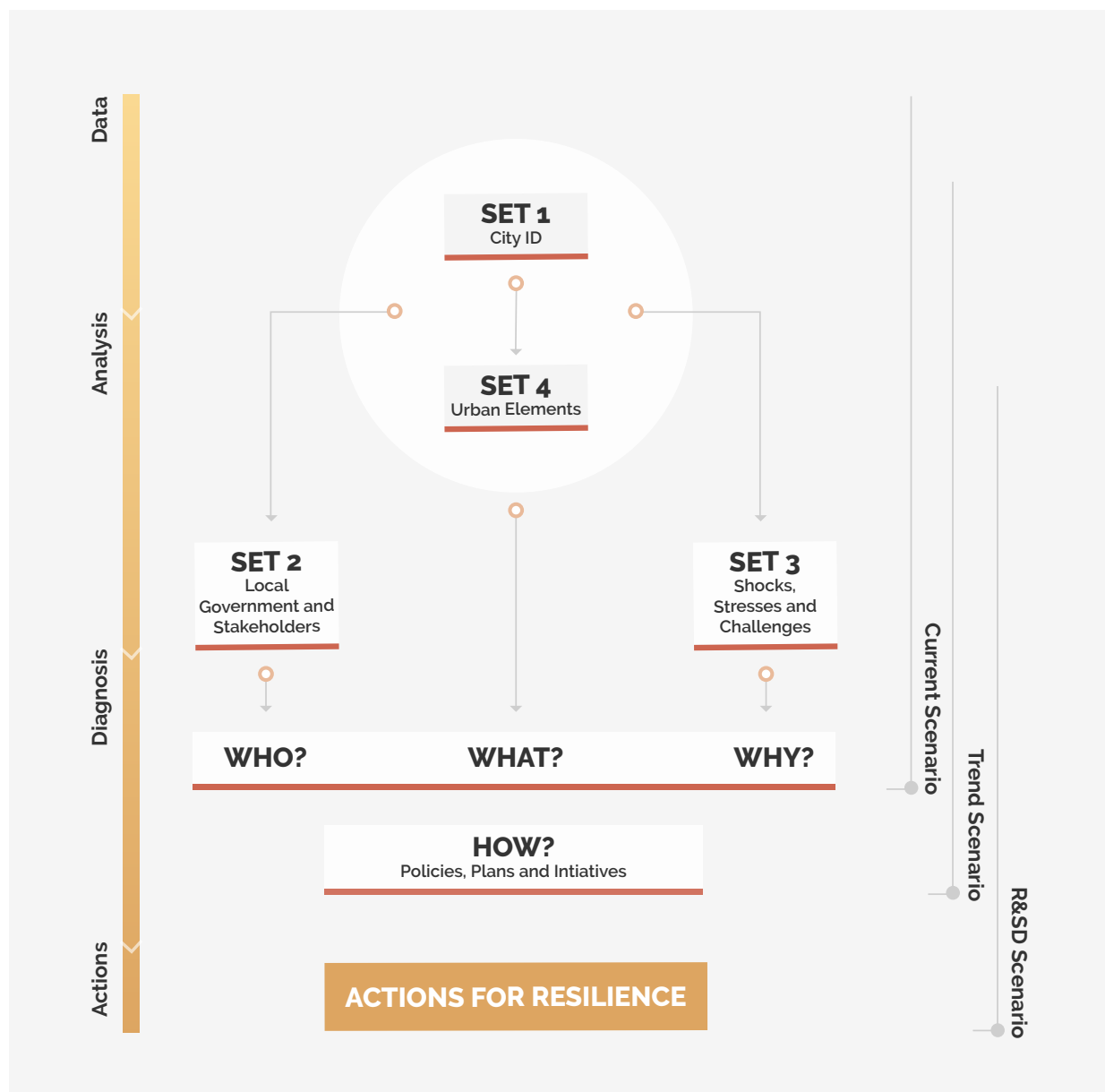


Figure 1: CRPP Implementation Process Diagram. Source: CRPP (2018).

As is illustrated in the diagram above, data is primarily collected in SET 1 – City ID, for context-related information, and in SET 4 – Urban Elements, for performance-related information. These data provide a basis to analyse the current strengths and weakness of the Urban System and its performance – the WHAT.

Following this synthesis of data comprising the WHAT, information gathered regarding key stakeholders (including the local government) and shocks, stresses and challenges (to which the city is found to be more or less vulnerable) are incorporated into the analysis.

In SET 2, stakeholder-related information is used to analyse the role and relationships of the different institutions and organisations acting in the city and determine the most influential actors – the WHO. This WHO is captured in Local Government and Stakeholder Analysis, which provides a brief mapping on the local government's structure, roles, and responsibilities. In addition, an overview is provided of key stakeholders from outside the local government (e.g. regional, provincial, national government, private companies, community organisations, NGOs, etc.).

SET 3 provides information regarding the existence, interactions, and prioritisation of the shocks, stresses and challenges in the city – the WHY. It is therefore the Shocks Analysis that examines the WHY by providing an overview of the various hazards faced by the city. This section assesses the various shocks, stresses, and challenges present in the city and summarizes the analytical processes conducted through which an identification and prioritization of shocks was determined, which includes whether or not, and to what degree, risk reduction measures have been established and the severity of impact or risk each shock category potentially poses.

Information on the existing development efforts, based on established policy and/or legal frameworks, which guides the future development of the city (i.e. existing policies, plans and initiatives), provides a lens through which to apply findings derived from data collected in the aforementioned four SETs. This information is organised in an inventory that coherently maps these in relation to WHAT the issues are, WHO are able to act, and WHY action should be done, to determine current areas of focus, gaps and overlaps – to formulate HOW to act.

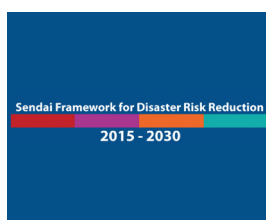
The result of these analyses is prioritised and implementable Lines of Actions or thematic areas of prioritisation, which are identified and agreed upon with the local government. Following a consolidation of CRPT analytical and diagnostic findings and integration of input from the local government and other key stakeholders, a focused, consensus-derived path towards resilience is formed. The Lines of Actions explore these resulting themes, presenting a culmination of collected data findings and preliminary analytical efforts, in combination with key stakeholder input derived from the several workshops conducted in conjunction with the local government. These Lines of Action can vary in scope but relate directly to both quantitative and qualitative information, representing a synthesis of each methodological step in the CRPT implementation.

From these Lines of Action, Recommendations for Actions for Resilience are developed and proposed in order to co-create a resilient and sustainable roadmap for the city. These Actions are intended to be both implementable and feasible, yet precise in targeting and ambitious in their expected impact.

This methodology was developed in alignment with globally agreed inter-governmental frameworks, namely: Sustainable Development Goals, Sendai Framework for Disaster Risk Reduction, Paris Agreement on Climate Change, World Humanitarian Summit - Agenda for Humanity, and the New Urban Agenda. Aligning CRPP with these frameworks enables the local governments who have implemented CRPT to better understand, report, and deliver on targets.

## Sendai Framework for Disaster Risk Reduction

The Sendai Framework calls for resilience on all levels, from local to regional and national. CRPP contributes to the Framework's overall objective to reduce vulnerability to disasters and increase preparedness for response and recovery, including contributions to the Four Priorities for Action:



- Priority 1. Contribution: Building evidence-based knowledge on disaster risk reduction;
- Priority 2. Contribution: Strengthening disaster risk governance through the adoption of plans;
- Priority 3. Contribution: Investment in risk reduction for resilience;
- Priority 4. Contribution: Scaling-up of preparedness and a 'build-back better' approach in recovery.

## Sustainable Development Goals



Urban resilience relates to key elements of sustainable urban development and the goals of the post-2015 Sustainable Development Agenda, notably in Goals 1, 2, 3, 9, 11, 13 and 14 where resilience is referenced but also in other goals where it is implied. Resilience is also a strong component of many of the stated aims throughout the preamble and paragraphs 7, 9, 14, 23, 29 and 33 of the Declaration to the SDGs.

## Paris Agreement on Climate Change



Article 7 calls for strengthening of resilience to climate change in the pursuit of sustainable development. By engaging Local Governments in these efforts, resilience in cities contributes to the following principles of the Paris Agreement:

- Adaptation (dealing with impacts of climate change);
- Loss and Damage (minimizing loss and damage linked to climate change);
- Role of cities (building resilience).



## World Humanitarian Summit – Agenda for Humanity

The core responsibilities defined at the World Humanitarian Summit have strong foundations in resilience thinking and building. The approach adopted by UN-Habitat to build resilience contributes to Core Priority 1D, 4A, 4B, 4C, and 5A.

## New Urban Agenda



Advancing the urban resilience agenda and working globally delivers on a number of key goals of the New Urban Agenda agreed by Member States during Habitat III, most prominently:

- New resilient planning paradigms in urban systems
- Legal and regulatory frameworks to enable and govern urban development
- Analysing risks inherent in urban areas
- Promoting good practice in local economic, development strategies through marketing safer, resilient cities.

# CRPP: Actions for Building Resilience

Actions for Resilience (A4R) constitutes the final product of UN-Habitat – CRPP’s urban resilience implementation process. The aim of this report is to better inform local governments, in this case the Municipality of Maputo, of the state of the city with regards to resilience, based on conclusions derived from of the CRPT implementation process previously described in this document. This document urges local government stakeholders to prepare, correct or apply initiatives (programmes, projects and plans) in a governance context that should be efficient, organized and transparent (with the local government leading the process) and within a safe and effective legal framework.

Actions for Resilience (A4R) aren’t necessarily built from scratch. Existing initiatives, policies and plans are taken into consideration, whether or not they are in progress/ adopted or not. Actions for Resilience are not only focused specifically on the field of urban planning, but rather value sectoral initiatives related to each identified stress, in addition to those related to territorial development or planning.

**The methodology for developing A4R is robust, but flexible and versatile enough to allow its adaptation and replication in different contexts. It constitutes a guide for designing new initiatives or modifying those already being implemented to promote resilience and sustainable development of local governments, focusing on the particularities of specific contexts.**

In short, A4R builds evidence to modify and improve existing initiatives, as well as proposes new initiatives from a resilient and sustainable approach.

The added value of A4R includes the development of a shared vision among actors, through a participation and consensus building process, and alignment with international agenda frameworks.

This document is divided into three chapters that describe the stages of developing A4R:

- Current Scenario: Identification and elaboration of the profile of the city.
- Trend Scenario: Potential impact of current plans, policies and initiatives.
- Resilient and Sustainable Scenario: Recommendations of Actions for Resilience and Sustainability.

## Building the Current Scenario: Identification and elaboration of the profile of the city

The Current Scenario is characterised through data derived from quantitative and qualitative multidisciplinary indicators (SMART<sup>3</sup>: specific, measurable, achievable, relevant and timely), field visits, and local knowledge. In parallel, an analysis should be conducted regarding how the current governance system functions in the city.

The indicators that reveal shortcomings in the urban system are grouped by themes, which, combined in a multidisciplinary way, form a composition of stresses and specific to the context. In this scenario, the impacts of the most recurrent shocks and affected behavior of the city are analysed: prevention and response measures are taken into consideration.

The compilation of these data serves as a snapshot of the characterisation of the city.

The urban system’s vulnerability to shocks prevents the achievement of the resilient scenario. The internal weaknesses of the urban system prevent the achievement of the sustainable scenario.

<sup>3</sup> United Nations Development Programme (UNDP). (2009).

Handbook on planning, monitoring and evaluating for development results. Pg – 63

## Building the Trend Scenario: Potential impact of current plans, policies and initiatives

The Trend Scenario is built upon the Current Scenario, analysing the expected effects on the urban system of current initiatives (policies, projects, programs and plans), whether they have been approved or not. The value of this analysis lies in its ability to propose potential corrections to certain negative trends or to include previously ignored issues into forecasting efforts. The Trend Scenario is the trigger for the formulation of Recommendations for Actions for Resilience. Likewise, the Resilient and Sustainable Scenario is derived from applying the Actions for Resilience to the Trend Scenario and therefore presents a realistic transformation process of the urban system.

## Building the Resilient and Sustainable Scenario: Formulation of actions for resilience (A4R)

The Actions for Resilience and Sustainability are organised according to the stress(es) they seek to address, their ability to be implemented, and the territorial scope they apply to which they apply. Although the first two categorisations offer a multitude of realistic actions to achieve a resilient urban system, through identifying the territorial scope, actions can provide changes to the urban system that support the incorporation of long-term sustainability in the city.

### Conceptual framework

The concept of urban resilience and sustainability is complex and multidimensional. The approach to evaluating the resilience of an urban area is informed by the systemic relationships between different urban sectors and stakeholders and the different lenses through which urban issues can be understood.

The main concepts related to the achievement of resilient and sustainable cities are: the underlying economic system, poverty, social segregation, social inequality, environmental degradation, lack of coverage and access to basic services, and urban metabolism management. At the same time, from these concepts, related stresses are derived; for example, social segregation occurs due to: the lack of social networks at both the neighbourhood and urban scale, the lack of inter-institutional cooperation and between citizens and administrations, an inadequate legal or regulatory framework justice, real or perceived insecurity, the proliferation of precarious settlements, territorial imbalances, and degraded peripheries.

Stresses are also characterised through the combination of different themes, a combination that defines the particularities of a specific city. The uniqueness of each city is established through a composition of transversal or cross-sectional elements and interconnected stresses, a dynamic that should be taken into consideration when implementing different initiatives.

## CRPP: Implementation Process in Maputo

Engagement in Maputo to implement CRPP and its resilience-building methodology as a pilot city began in the last quarter of 2016 and was solidified in mid-2017 through a Memorandum of Understanding (MoU) prepared in joint collaboration by UN-Habitat and the Municipality of Maputo. During this period, UN-Habitat selected a City Focal Point who, after undergoing training on urban resilience and CRPT, particularly in data collection and analysis, would directly implement CRPT in coordination with the Municipality. The municipality assigned two (2) Municipal Focal Points to directly support the efforts of CRPT. UN-Habitat performed 4 field visits to further engagement and training with key city partners.

CRPT was implemented in Maputo following the overlapping process of data collection, stakeholders' engagement, analysis, diagnosis and recommendations for action. The Focal Points led data collection efforts through data mining, technical meetings and multi-sector workshops. The workshops in particular aimed not only to populate necessary data, but also to engage and train municipal technicians and councillors, as well as other relevant stakeholders, on urban resilience and its transversal nature.

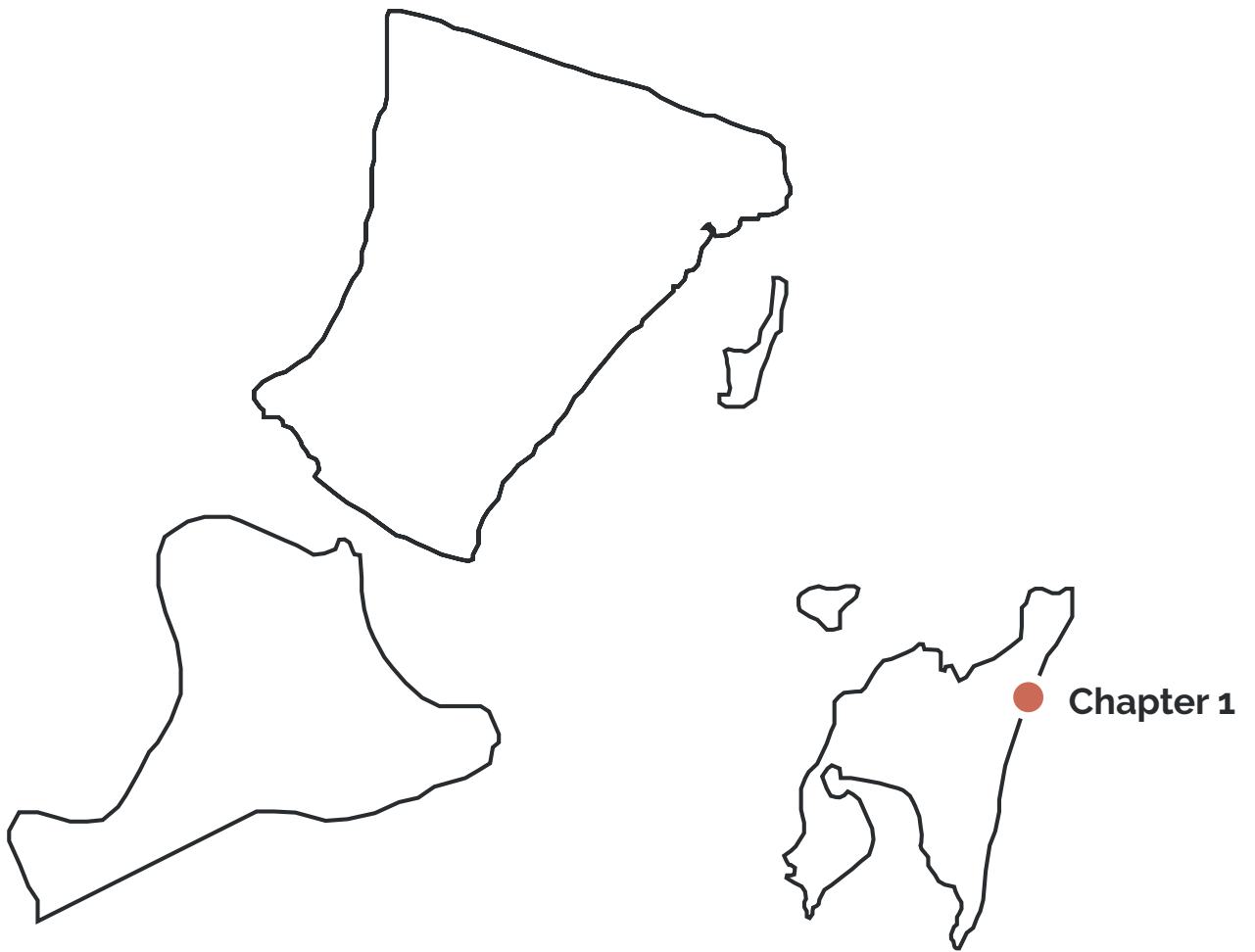
From the progressive stages of data collection stems the City Snapshot, which provides a general contextual overview, as well as the Resilience Profile, which includes performance and stakeholder analysis. These were brought together in a diagnosis, which was presented and verified during the Diagnosis Workshop held in November 2018. The main outcomes of this workshop are the Lines of Action, on which the Actions for Resilience and Sustainability recommendations are based. In March 2019, the proposed actions were presented to the relevant stakeholders through the Actions for Resilience Workshop to reach a consensus on a roadmap towards Maputo's resilient and sustainable urban development. These efforts culminated in an official launch of the City Profile and Actions for Resilience at the end of March 2019.



Figure 2: Timeline of CRPP Implementation in Maputo. Source: CRPP (2019).



- Milestone events
- Major stages in implementation
- Other workshops / training missions
- Maputo participation in events



# **Chapter 1**

## Current Scenario

Figure 3: Location of Maputo city. Source: CRPP based on Google Maps information (2019).



# Chapter 1

## Current Scenario

### 1.1 Context of the City of Maputo

Maputo is the capital city of the Republic of Mozambique and is located in south-eastern Africa. It is also the largest city and main financial, business and commercial centre of the country. As illustrated in **figure 3**, Maputo is located in the extreme south of Mozambique, situated on the triple border between both South Africa and Eswatini (former Swaziland). The city is on the western coast of Maputo Bay, bounded by the Indian Ocean.

Maputo comprises an area of 347 km<sup>2</sup> and is located 47 meters above sea level. It has a tropical savannah climate, according to the Koeppen-Geiger classification, and has a varied, two season climate (summer and winter), as well as annual precipitation variability: warm and rainy climate in summer (from October to April) and slightly colder and drier in winter (from May to September). The average annual rainfall is about 781 mm, with the monthly maximum average in January (125.8 mm) and the minimum in August (13.1 mm). During the summer, the average temperature is around 30°C to 31°C and precipitation during the months of November to March represents 73% of the average rainfall. In winter, the average temperature is 25°C to 26°C during July and August, and rainfall is scarce (average values do not exceed 20 mm between May and September). Southwest winds prevail in summer, while northwest winds prevail during winter. These climatic characteristics, in combination with the geographical position of Maputo - exposed to the Indian Ocean - as well as other biophysical characteristics (e.g. steep slopes and landslides, wetlands and mangroves, and environmental degradation), intensify the occurrence and effect of extreme events such as floods, cyclones, heat waves, droughts, and erosion processes (**See Annex V. Future climate change, expected impacts and vulnerability in Maputo city by the end of the 21st century**).

Key data	
<b>Area:</b>	347 km <sup>2</sup>
<b>Altitude:</b>	47 meters above sea level
<b>Köppen-Geiger Climate Classification System:</b>	Humid Subtropical
<b>Average monthly temperature:</b>	23°C
<b>Average annual rainfall:</b>	781 mm
<b>Annual average relative humidity:</b>	66,6%
<b>Demography:</b>	1 273 076 inhabitants
<b>Population density:</b>	3.648 inhabitants/km <sup>2</sup>
<b>Life expectancy:</b>	59,4 years
<b>Literacy rate:</b>	9.5 %
<b>Main sectors of the economy:</b>	Agriculture, Industry, Tourism and Services

**Table 1:** Key information about Maputo city.

Source: Prepared by CRPP (2019) with information from the CRPT data collection process.

Regarding the demographic and socioeconomic characteristics, it is important to note the City of Maputo has high birth and immigration rates. Such a scenario leads to major socioeconomic challenges for Local Government, including service delivery, infrastructure, and food supply. **Table 1** summarizes some key information on the biophysical, demographic, and socioeconomic characteristics of Maputo.

Indicative	District
1	KaMpfumo Urban District
2	NIhamankulu Urban District
3	KaMaxaquene Urban District
4	KaMavota Urban District
5	KaMubukwana Urban District
6	KaTembe Urban District
7	KaNyaka Urban District



**Figure 4:** Territorial map showing administrative units of the city of Maputo. Source: CRPP (2019) with information from the CRPT data collection process.

## 1.2 Construction of the Current Scenario

The endogenous (stress) and exogenous (shock) factors that influence the functioning and organization of the city were identified through an exhaustive collection of indicators and analysis of the performance of urban elements. This information was provided by Municipality technicians, and gathered and evaluated from a sectoral point of view as well as from various cross-cutting thematic perspectives. The information from the survey of stakeholders currently working with the Municipality provides a snapshot of the Current Scenario (described in the explanation of the CRPP methodology in the introduction).

Municipality technicians gathered an exhaustive collection of almost 500 indicators. For statistical analysis, the indicators were grouped into eight thematic elements or groups that provide sectoral information, namely: Built Environment, Supply Chain and Logistics, Basic Infrastructure, Mobility, Municipal Public Services, Social Inclusion and Protection, Economy, and Ecology.

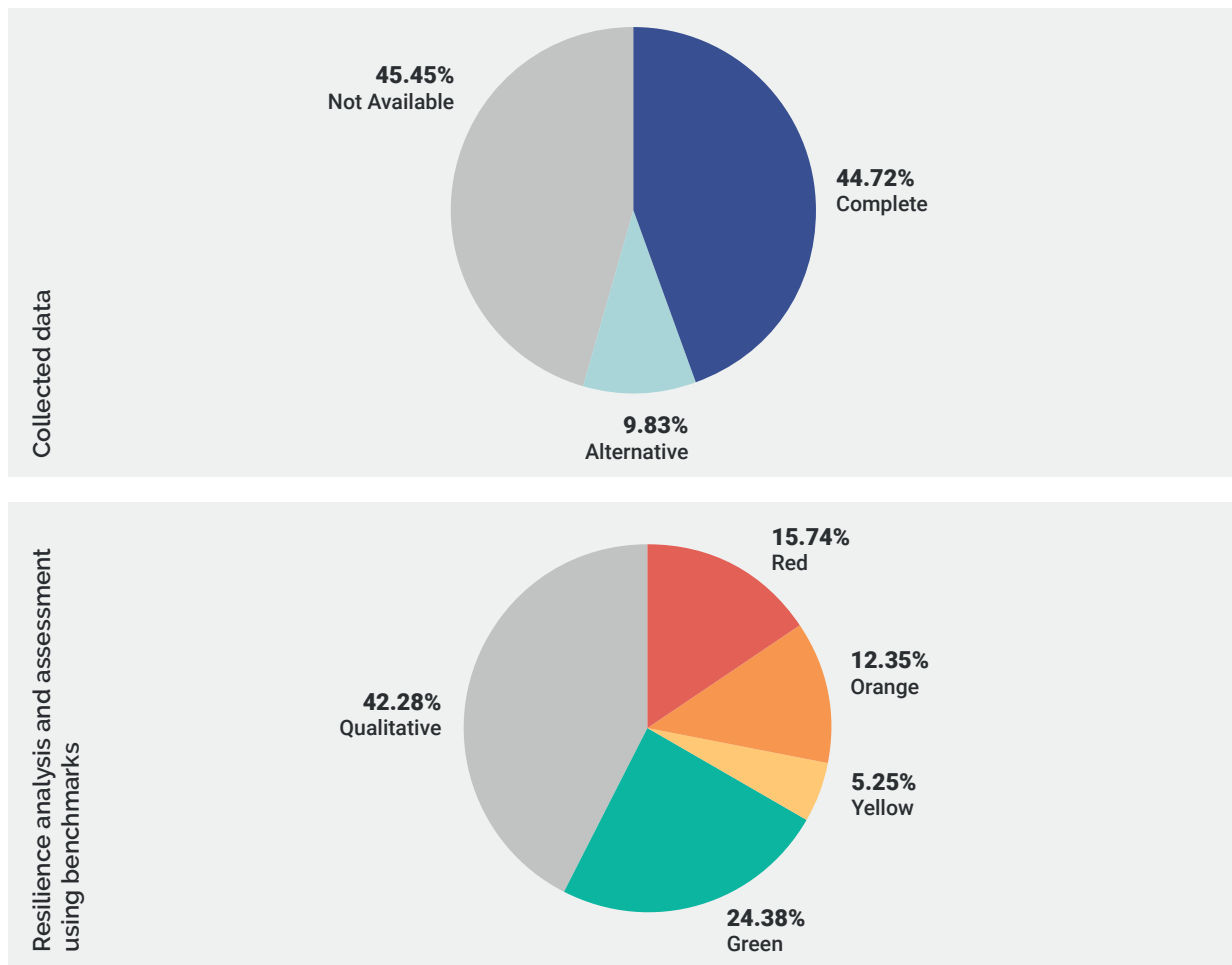


Figure 5: Visualization of results after data collection and Resilience assessment. Source: CRPT (2019).

After the initial analysis, 55% of the indicators were collected. This percentage is reasonable considering that this is the first time such a survey has been carried out and on many occasions it has not been possible to answer the exact question. However, this also reinforces the need for the City Council to systematically carry out data collection from the various sectors and their corresponding updating; available and up-to-date information helps in decision making and prioritization of actions.

Regarding resilience, Maputo still has a lot of work to do. Only approximately 25% of the results indicate that the City is performing well or reasonably well in terms of resilience. In addition, more than 40% information was unavailable at the time of this analysis, indicating the true performance is potentially worse than available evidence suggests. Once all the results have been analysed, there are some conclusions that are shared by all Urban Elements:



- There is a general lack of reliable data and information to help evaluate the performance of each sector. There is a need to improve the system for collecting, analysing and updating existing information in the City Council so that the institution can make use of it to improve revenue, identify new interventions, prioritise actions and negotiate with other stakeholders.
- Although there is very up-to-date legislation (both at the National and Municipal levels), it is necessary to disseminate legislation updates among the Municipality's technicians and to work more on their effective compliance.
- It is still common today to confuse the concepts of resilience and emergency. There is a misconception that a resilient city is one that responds to emergencies promptly, regardless of its ability to recover after a disaster, or that a resilient city "is lucky because emergencies hardly ever happen".

The main conclusions of each of the urban elements are outlined below and more detailed information can be found in **Annex III. Urban Elements Performance Overview:**

#### **Built Environment**

- Rapid growth of Maputo, which makes territorial planning difficult
- Proliferation of informal settlements, where 70% of the city's population lives
- 35% of housing is located in hazardous and environmentally sensitive areas (with the consequent degradation of ecosystems)

#### **Supply Chain & Logistics**

- Heavy reliance on higher-priced commodities (mainly food) from neighbouring South Africa.
- Inadequate domestic road network

#### **Basic Infrastructure**

- Inefficient or unreliable water and electricity networks. High levels of drinking water waste and insufficient use of rainwater
- Poor wastewater treatment (health and environmental problems), with 50% of the population without access to safe treatment services
- Coal (63.5%) and firewood (14.9%) remain main domestic fuels (perpetuates environmental deterioration)
- Environmental problems derived from the insufficient application of "3R" (reduce, reuse, recycle).

#### **Mobility**

- High level of congestion due to various factors (informal economy, etc.)
- Need of improving the urban environment and enhancing walking (e.g. sidewalks)
- Unclear regulatory and institutional frameworks, insufficient to meet demand

#### **Municipal Public Services**

- There are heritage and cultural activities, but access to such activities is uneven across the city (instance of social inequity)
- High level of insecurity in the city (mainly in the outskirts); it is necessary to increase coverage of public lighting
- Malaria and HIV are key public health issues

### Social Inclusion and Protection

- Limited involvement of Civil Society Organizations (CSOs)
- Overburdened schools (high demand, overcrowded facilities)
- Sanitary facilities of the city under great pressure (exacerbated by the proliferation of malaria cases at certain times of the year).
- Little attention provided to people with special needs (accessibility problems, etc.)

### Economy

- High level of informal employment (52%)
- High unemployment (28.9%), especially among young people (39.7%)
- Inequality (at both municipal and national level)
- Low revenue from land use and real estate

### Ecology

- High levels of pollution
- New initiatives that encourage the maintenance of ecosystems have started to emerge, which should be monitored and enforced by the Municipality.

As a result of this statistical analysis three major stresses were identified. These stresses<sup>4</sup>, or endogenous issues that condition the city in relation to resilience, were also confirmed by the Municipality. Namely:

1. Rapid and unregulated urbanisation
2. Socioeconomic inequity
3. Inefficient management of urban metabolism

There also exist exogenous or external causes that clearly affect the city. They are called shocks<sup>5</sup>, defined as uncertain, abrupt or long-onset events that have the potential to impact the purpose or objectives of an urban system). Five shocks were identified as priorities in Maputo: (**see Annex IV. Shock analysis**):

**Natural:** Drought, Heatwave, Flood, and Cyclone.

**Biological:** Malaria.

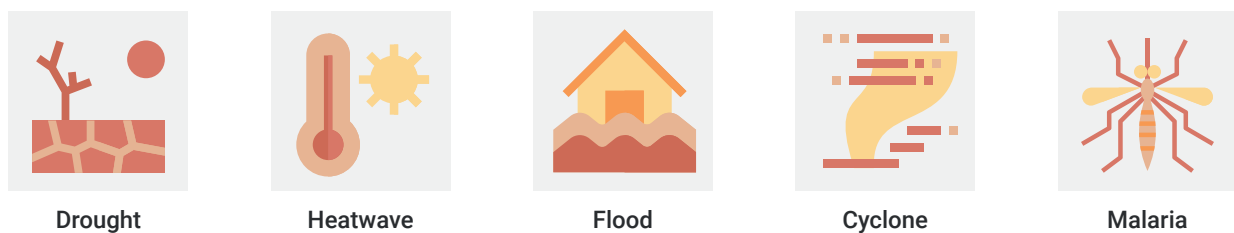


Figure 6: Priority Shocks in Maputo. Source: CRPT (2019).

<sup>4</sup> These are defined as chronic and continuous dynamic pressures originating within an urban system with potential for cumulative impacts on the system's ability and ability to achieve its objectives.

<sup>5</sup> These are defined as uncertain, abrupt or long-onset events that have the potential to impact the purpose or objectives of an urban system.

In order to prioritise shocks in Maputo, the following criteria were considered:

- The evaluation of the impact each shock generates on the population, resources and processes
- Frequency of events and their impacts on different areas of the city and its population.
- Analysis of how the different shocks act on the different elements and components of the urban system, considering the interdependencies between these constituent parts of the urban system.
- Projections of climate change trends in Maputo and how these trends may aggravate the impacts of identified shocks.

It should be noted that Maputo City and the development of its Resilience Profile with UN-Habitat served as a case study for the Global Users Copernicus Change Service (Glorious) Project, developed by Lobelia for Isardsat. Thanks to data provided by European satellites and based on defined and calibrated models, it was possible to obtain key information on climate change trends in the city. These trends indicate rising temperatures and the likelihood of storms and floods that may affect the incidence of malaria. (**See Annex V. Future climate change, expected impacts and vulnerability in Maputo city by the end of the 21st century**).

From the analysis of governance and of relevant actors involved in the implementation of initiatives, key information was obtained including, but not limited to (**see Annex VI. Local Government and stakeholder analysis**):

- Local Government and National Government remain highly connected despite the existence of decentralisation policies, which consider Local Government (municipalities) as autonomous bodies.
- There exists significant influence and levels of participation of relevant institutions in development efforts in the city, including partners in development and cooperation, such as the World Bank, AfDB, foreign governments, and the United Nations.
- The lack of effective coordination between actors operating at the local level is a constraint to the sustainable management of funds allocated to the implementation of various initiatives, increases the redundancy of interventions and functions.
- There is a significant need to strengthen coordinated action as well as communication processes between actors.
- General data on the role of actors in risk reduction and their relationships is limited. Available data, however, indicate relatively dominant roles of national agencies and bodies in the development and implementation of risk reduction measures and strategies.
- There seems to be a good level of coordination between national and local actors in terms of emergency response and humanitarian disaster relief. However, little data is available on how these actors are interconnected and cooperate on long-term risk mitigation measures.

## 1.3 Identification, prioritisation and description of Stressors in Maputo

The City Resilience Profile Tool (CRPT) supports the New Urban Agenda (NUA) and the Sustainable Development Goals (SDGs), and recognises the importance of localising them at the urban scale. In addition, the CRPP methodology recognises that inconsistencies with these objectives have the potential to diminish sustainability, which is a major contributor to resilience building.

Therefore, stress identification was based on a predefined initial table, linking stresses with a specific SDG (**See Appendix 1. Current Scenario: stresses and stressors identification in Maputo**). Using the New Urban Agenda as the urban lens to look at the SDGs, this diagnosis links stresses with City Resilience Profile Tool indicators through a number of stressors highlighted throughout NUA commitments.

For a comprehensive understanding of the stresses in the urban system and their underlying stressors, a qualitative reading of the available data is also performed as another layer of analysis in order to identify more stressors that have not been detected through the indicators comprising the Urban Elements. For the purpose of this qualitative analysis, experts have made an extensive review of existing documentation, including theoretical and empirical research by academics and practitioners.

### Identification and prioritisation of stresses

In order to select the main stresses that press the urban system, an analysis was conducted on how stressors affect CRPT indicators (**See Appendix 2. Current Scenario: selection of indicators and their relation to shocks and stresses in Maputo**). This analysis has identified the main stresses that are pressing the urban system and diminishing Maputo's capacity for sustainability and resilience, leading to increased vulnerability.

In addition, priority stresses in Maputo were confirmed through quantitative and qualitative analysis based on data provided by the local government. Data collection occurred through a combination of expert interviews, research, and consultations. As already stated in the explanation of the CRPT methodology, a common baseline has been established, which identifies desirable standards for any municipality (as set out in the New Urban Agenda and the SDGs), regardless of location, population, etc.

The methodology undertaken as a part of this analysis presents the results visually, using colours to reflect the measurable performance for a particular supporting indicator. This assessment allows each city to better understand at what level it meets these internationally established criteria (**See Annex III. Urban elements performance overview**). A first glimpse of the city can be obtained by taking into consideration the composition of indicator colours for a specific Urban Element, component, specific sub-topic, or for the city as a whole:

- Green: indicator is within desirable standards
- Yellow: indicator is close to desirable
- Orange: indicator is far from desirable
- Red: indicator suggests an unsatisfactory situation

Thus, the information gathered in Maputo gave a colour gradation that shows the situation of the city in relation to the established standards. 'The analytical process focused mainly on the 'reds' and 'oranges', in order to identify the most deficient areas.

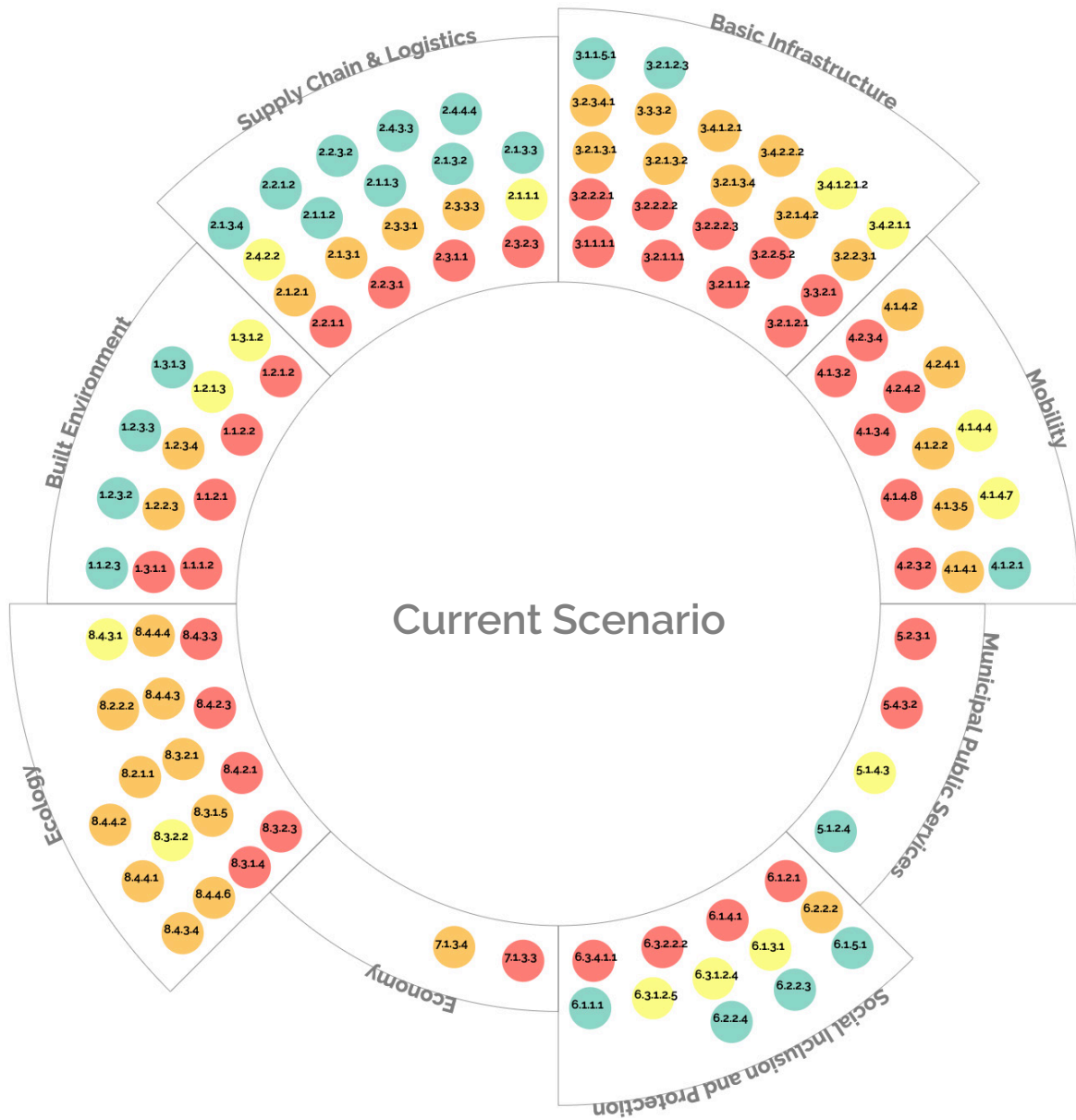


Figure 7: Current Scenario of Maputo City. Assessment of the Resilience of some of the Indicators in Maputo by colour. Stress identification from the study of Urban elements. Source: CRPP (2019).

Through this analysis, 3 stresses and 11 stressors were identified as priorities in Maputo City (See Appendix 1. Current Scenario: identification of stresses and stressors in Maputo).




**Figure 8:** Relationship of negative performance of CRPT Indicators and the generation of stressors by each respective stress.  
 Source: Prepared by CRPP (2019) with information from the CRPT data collection process.

It is important to note from the outset that a lack of contextual and historical knowledge of a city limits the degree to which efficient, detailed and customised solutions can be developed to address the complexity of challenges present in the urban system. Generally, contextual information gathered about cities is studied in a decontextualised manner and without understanding why certain dynamics exist while others do not. In developing strategies, it is important to both understand and address the processes from which the identified negative measurements of system performance stem. Thus, this methodology seeks to incorporate information gathered as part of the City Snapshot into the analysis of urban performance data so that developed actions are more directly grounded in a city's historical and contextual realities.

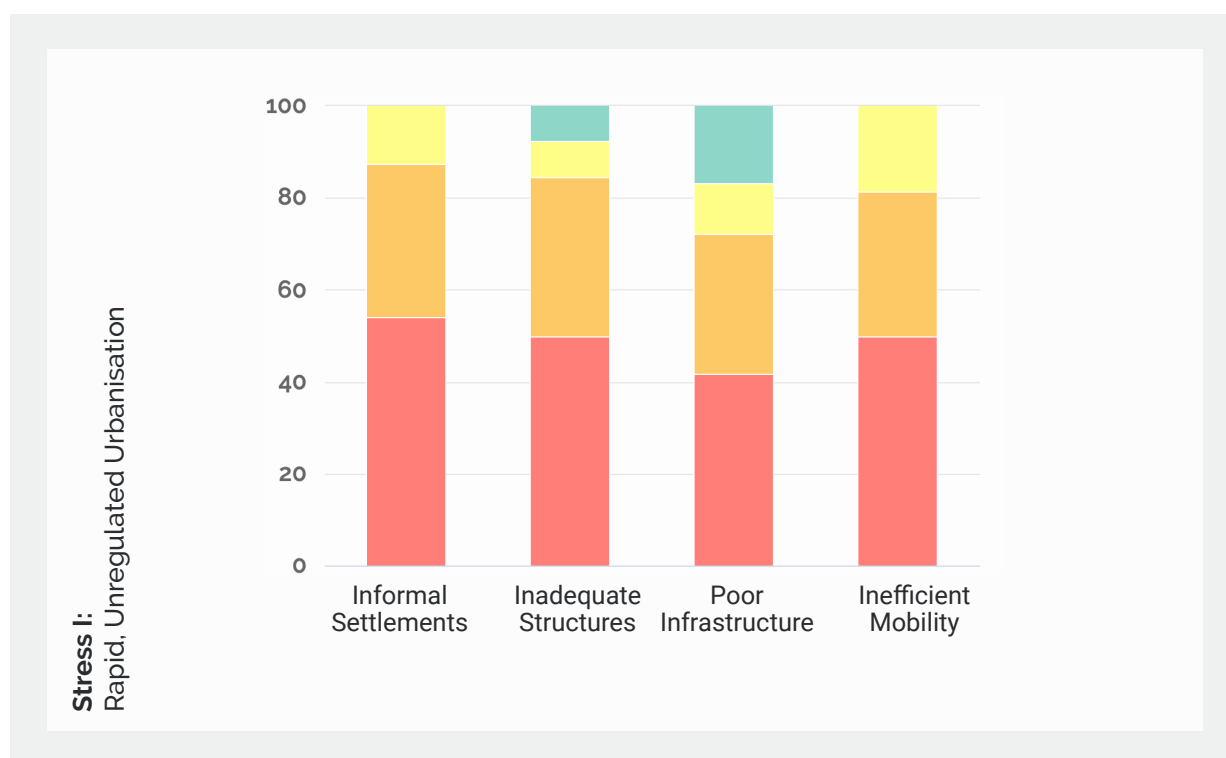
## Description of prioritised stresses and associated stressors

**Stress I: Rapid, Unregulated Urbanisation**



**Associated stressors:**

- Informal settlements
- Inadequate (insufficient) coverage of basic infrastructure - poor/deficient infrastructure
- Inadequate structures caused by improper compliance with laws and regulations.
- Inefficient mobility



**Figure 9:** Rapid urbanisation without regulation. Source: CRPT (2019).

It is almost impossible to separate one stressor from another because they are closely related and are a consequence, and cause, of each other. Considering the widespread challenge that mobility poses for most inhabitants in Maputo, this stressor is given a more detailed explanation.

**Process of generating this set of combined stressors (informal settlements, inadequate/insufficient coverage of basic infrastructure and inadequate structures caused by non-compliance with laws and regulations)**

In 2017 the Municipality of Maputo celebrated its 130th anniversary. The current situation of Maputo is undoubtedly a result of its lengthy history and development. Its founding, Maputo (formerly Lourenço Marques) has always been segregated based on race. Segregation in turn caused greater prejudice as the city's population grew, especially in



the poorer areas. For instance, in the late nineteenth/early twentieth century, unequal access and segregated city life was established at all levels, such as in education, where the native population was not entitled to attend schools. Over time, school attendance was permitted up to grade 4.

The so-called “cement city” was the historical, colonial part of the city (institutional buildings and settler residences). The periphery was progressively occupied by the indigenous population, where, because building with durable materials was prohibited, became known as the “reed city” or areas where wooden and zinc houses were common (see Annex II). Characterization of the city).

Some of the neighbourhoods located on the outskirts of Maputo are an exception to this dynamic, such as Munhuana. Known as an indigenous neighbourhood, Munhuana was conceived in the 1940s by the City Council and was funded by the South African Government as compensation for the collapse of a mine in which many Mozambicans died. The neighbourhood has a centralised layout with long streets and all the necessary public services (medical dispensary, school, police station, etc.). Masonry houses were built to house City Hall officials. However, the choice to locate officials in this area was perhaps ill-advised as the neighbourhood has been flooded several times since its creation.



**Image 1:** Aerial view of Munhuana's neighbourhood.

Source: Roteiro Histórico de Maputo, Sopa and Rungo (2005).



**Image 2:** Brick houses T-1, T-2 e T-3. Source: Roteiro Histórico de Maputo, Sopa and Rungo (2005).



The current Maputo is a reflection/consequence of what happened during the period of, and especially the years following, independence (1975). With the departure of the colonists, there was a major sociological change that affected the city, as the nationalisation of existing lands and buildings took place (which meant access to a decent home for many families for the first time). However, this change also brought consequences in the structure and investment in the city; investments in the improvement and maintenance of most of the buildings and municipal infrastructure were practically non-existent due to the lack of financial resources available to both the State and inhabitants at the time.



**Image 3:** Moments of community building of the communal villages (end 70-80) Source: Arquivo fotográfico do Conselho Municipal de Maputo.

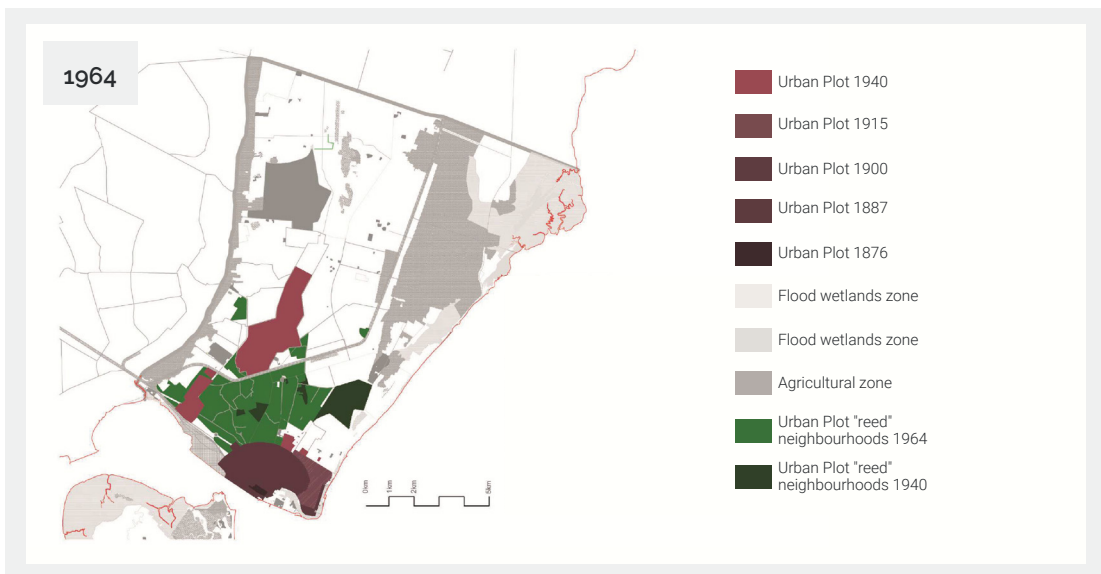
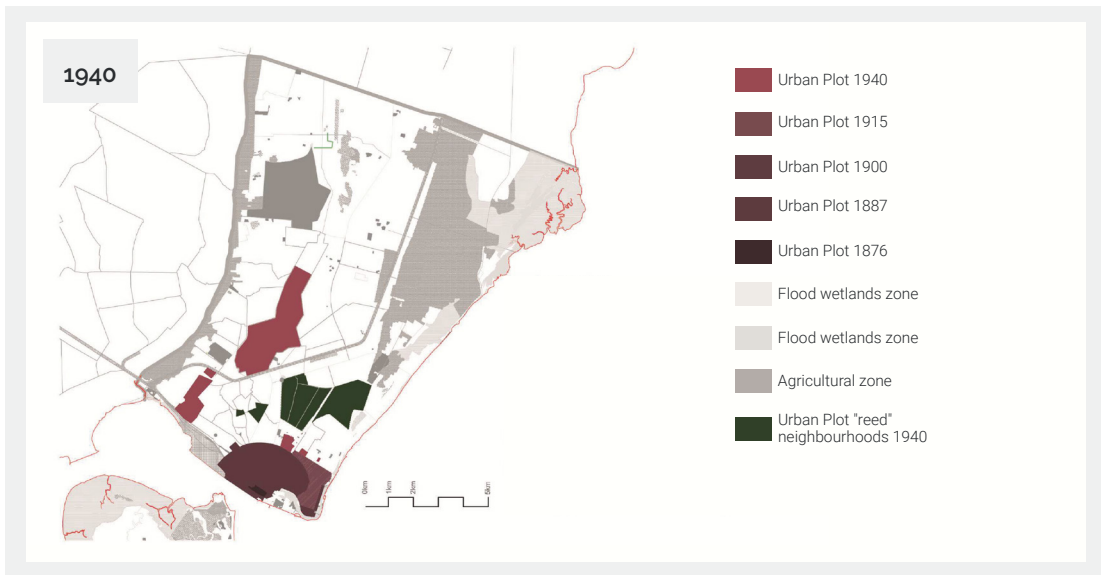
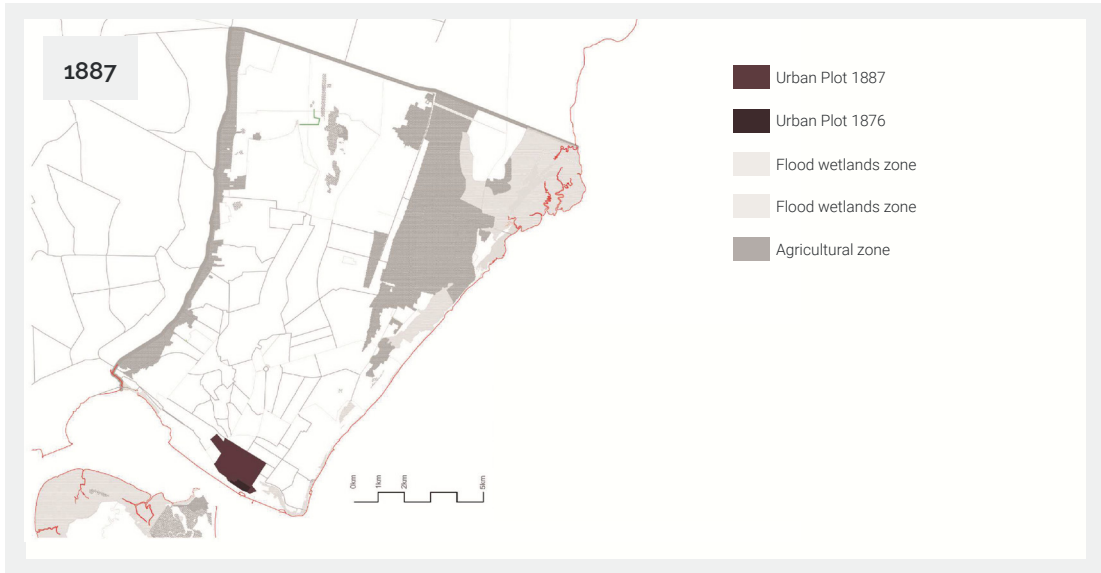
During the years of civil war (1976-1992), Maputo experienced a considerable population increase, aggravating the problems already emerging at that time such as excessive densification, lack of urban organisation, lack of basic infrastructure, etc. Emblematic of this period were the development of communal villages, where many families were displaced because they built in improper (flooded) areas; it was then the responsibility of the entire community to build in new places. (See **Annex III. Urban elements performance overview**) for more specific data on access to basic services.

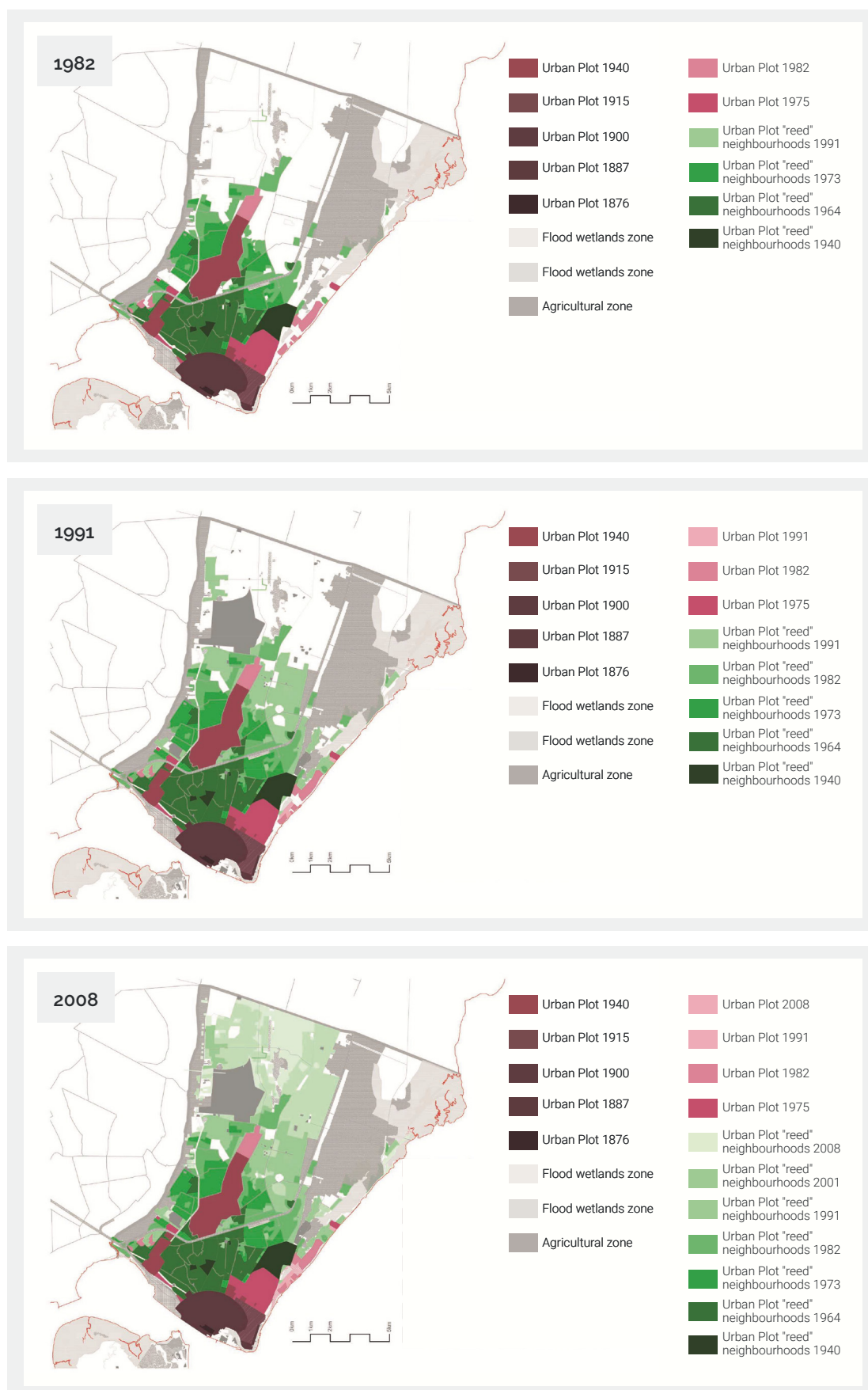


**Image 4:** Moments of community building of the communal villages (end 70-80) Source: Arquivo fotográfico do Conselho Municipal de Maputo.

This rapid and uncontrolled growth of the city in the years after independence was not accompanied by the development of necessary urban infrastructure and municipal services, as despite the creation of planning resources at that time, the existence of plans and guidelines does not guarantee their application (especially in situations of poverty and absolute despair).

Currently, while the municipal government (CMM) has a large technical staff, all departments have a shortage of staff which presents a major operational challenge regarding compliance with legislation (at both the national and municipal levels). Much of CMM's effort in recent years has been to improve staffing levels, which can in turn help to improve the conditions for the city's inhabitants. However, enforcement of existing legislation (some of which is already outdated and in need of updating) remains one of the main challenges facing Maputo today.





**Figure 10:** Urban footprint growth in Maputo. Source: Evolução e tendências regidas pelas mudanças históricas, contextos e actores implicados nos bairros suburbanos e periurbanos: o caso de Maputo. Arwen Prendergast (2011).<sup>6</sup>

<sup>6</sup> This Master thesis is part of a set of empirical, quantitative (GIS) and qualitative works and researches, culminating in a doctoral thesis (publication pending). Prendergast, Arwen.



## Associated stressor generation process (inefficient internal mobility)

Inefficient internal mobility is a further consequence of rapid urbanisation and the categorisation (or segregation) of the city since its inception. Currently, this stressor has a huge impact on the daily lives of residents (closely related to the stress below, socio-economic inequality) and therefore deserves further analysis.

Over the past 10-15 years, as the population has grown in the city (especially in the outlying neighbourhoods during the 1980s and 1990s), so has the number of private vehicles, although vehicle ownership rates remain low at 44 out of 1,000 people relative to higher income contexts (See Annex III. Urban elements performance overview - Mobility).

Due to the centralised spatial composition of Maputo, the “cement city” has attracted a large number of people for years, both because of the existence of administrative and institutional buildings (schools, hospitals, ministries, banks, etc.), as well as the fact that many of the job opportunities are concentrated in this area. The corresponding increase in the number of private vehicles coupled with the scarcity of public transportation alternatives has made transportation one of the main concerns for all actors living in the city (residents, the private sector, and the Municipality). It should also be considered that travel distances have lengthened as the cost of renting or acquiring residence in many areas of the city has increased and many people are forced to live farther away. Thus, the transport problem is not limited to the administrative territory of Maputo City, but also affects the Municipalities of Matola and Boane and part of the surrounding Marracuene District. This whole area has been named Greater Maputo and the involvement of multiple administrations and territories creates greater complexity surrounding transportation challenges.



Image 5: Tchapa in Maputo. Source: Google images (2019).



Image 6: Mylove in Maputo. Source: Google images (2019).

Transport is a necessary service for almost all population groups but in Maputo comprises a significant proportion of monthly household expenses. Due to the inadequate bus network, it is often necessary for a person to take two Tchapas (semi-collective transport) and also walk to their destination from home. Citizens adapt to the lack of transportation by adopting alternative systems that are both dangerous and detrimental to the flow of traffic: the so-called Mylove (pick-up trucks with no intended capacity to transport people). Although this type of transport was initially only utilised on the outskirts of the city, increasing demand has made it a very attractive alternative for a greater number of city residents. It is important to remember that tackling mobility challenges requires a macro perspective (i.e. an understanding of the mobility dynamics of Greater Maputo area as a whole), but the pedestrian level should not be overlooked.

Considering that most of Maputo's population resides in informal areas, many pedestrians walk from their homes to bus stops and other parts of the city. The route of people in these peripheral neighbourhoods is complicated, especially

in rainy weather; due to the lack of a proper drainage system, there are numerous flooded and almost impassable streets until the water disappears.

In the “city of cement” pedestrian circulation problems are also present, although they manifest themselves differently. There is no proper maintenance of the sidewalks by the CMM. Furthermore, there is a lack of responsibility by private sector builders to repair sidewalks damaged during construction projects. And yet, undoubtedly, the main problem regarding the sidewalks in the “city of cement” is car occupancy. The prevalence of private vehicles parking on pedestrian sidewalks (as illustrated in the image 8) affects the movement of people, endangering their safety by forcing them to walk in the road. The endangerment is especially problematic for more vulnerable groups such as the disabled, children, and the elderly. The car has occupied not only its rightful space on the road, but also the space that belongs (or should belong) to the citizen on foot.



**Image 7:** Example of flooded streets in peripheral neighbourhoods.

Source: CRPP (2019).



**Image 8:** Example of cars parked on sidewalks, preventing pedestrian traffic and endangering their safety. Source: CRPP (2019).

## Stress II: Socio-economic Inequity



### Associated Stressors:

- Space segregation - zonification
- Lack of social inclusion
- Informal economy
- Insecurity of land tenure

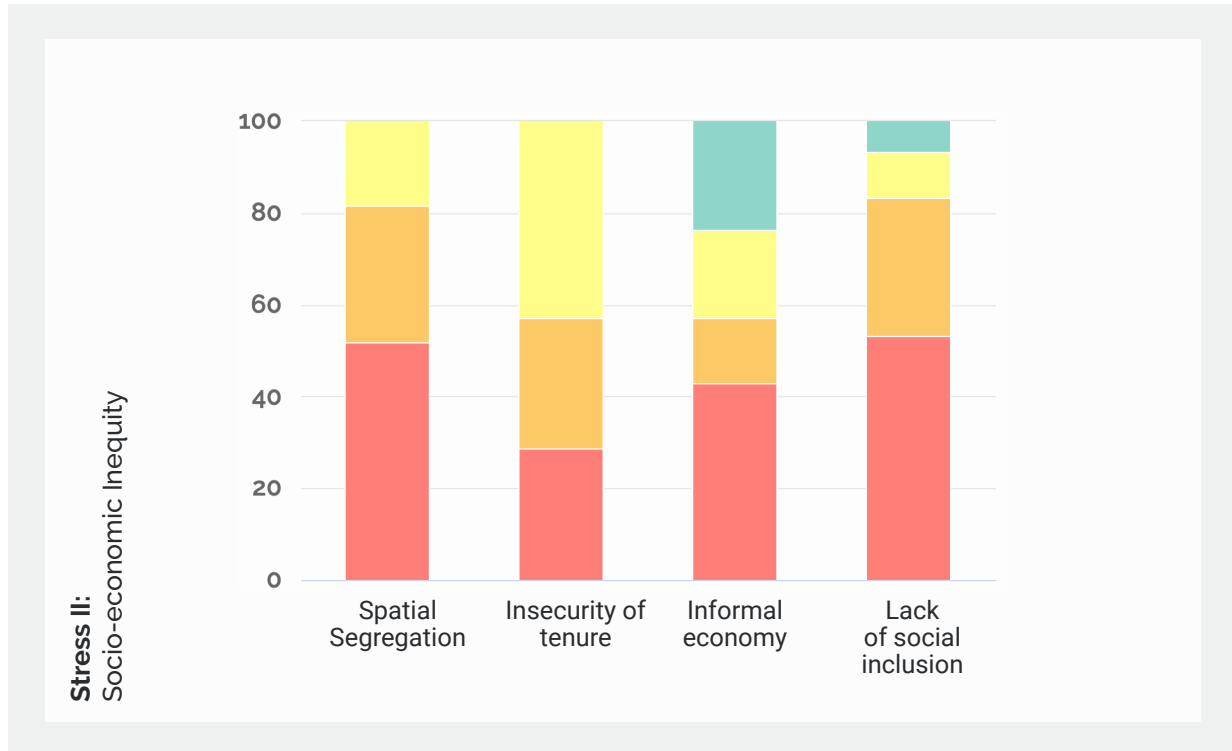


Figure 11: Socioeconomic Inequality. Source: CRPT (2019).

According to the third National Poverty Assessment<sup>7</sup>, conducted in 2010, the poverty rate is 54.7% in Mozambique. The country "is number 197 out of 210 in the 'ranking' of countries of per capita income level", according to the World Bank. Similarly, in a World Bank list of countries that have been ranked in terms of per capita wealth, Mozambique ranks 139 out of 152, while the country ranks 177 out of 195 countries under-5 mortality according to the United Nations<sup>8</sup>. Perhaps most striking, the same National Poverty Assessment<sup>9</sup> finds that "Maputo's position appeared extraordinary in the sense that poverty in Maputo was almost as high as in many other parts of the country."

### Process of generating a set of combined stressors (Spatial Segregation / Zonification, Lack of Social Inclusion, Informal Economy and Land Tenure Insecurity)

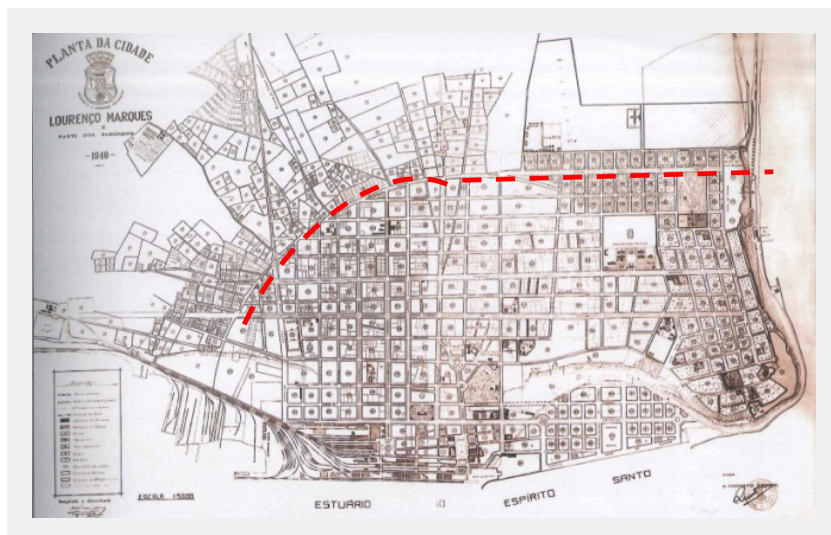
As with the previous stress, it is difficult to deal with stressors independently, as they are closely related to each other. In Maputo, as has been discussed, there are two cities: the "cement city" and the informal city (or "reed city"). The latter accounts for 70% of the built surface of the city and is the area where the majority of the population lives. This belt around the "cement city" is a consequence of the history and evolution of the city; originally it was forbidden for the native population (black) to live inside it and they were forced to live in the peripheral areas.

<sup>8</sup> Boom, B.v.d. (2011). Poverty Assessment in Mozambique.

<sup>9</sup> Ibid. p1

<sup>10</sup> Ibid.





**Image 9:** Plan of the City of Lourenço Marques in 1940. From the dashed area downwards, the cement city. Source: Maputo, património da estrutura e forma urbana., de João Sousa Morais (2001).

As already mentioned, a differentiation in the type of construction also permeated throughout the development of the city: the native population built their houses primarily using wood and zinc, a result of both economic and legal constraints. Above all, this differentiation in construction techniques reinforced inequalities in the city. Even today, houses in the “cement city” are almost all used as institutional and administrative buildings, which enhances their “noble” character compared to the rest of the city.

In 1976, the creation of the State Real Estate Administration (APIE) marked the nationalisation of key services such as health, education, and infrastructure and resulting in many Mozambicans moving into a brick house or building for the first time. However, throughout the years of civil war and the massive arrival of people into the city, social segregation (or lack of inclusion) continued. From the signing of the Peace Agreements in 1992 to the present day, Maputo has continued to have two realities, based mainly on the economic differences that existed (and exist) between the residents of informal areas and those who inhabit the “cement city”. This dichotomy between formal and informal in the present city encompasses many aspects including land tenure and other socio-economic issues. It is the latter that most reflects this segregation. In the informal city, coverage of basic services such as water supply and street lighting is significantly lower and other services such as sewage system, access play areas or green spaces are practically non-existent. The lack of other social services, such as education and health, are also a reflection of this inequality.

In addition to inequalities stemming from access to and coverage of services, the proportion of inhabitants living in hazardous areas is much higher in the “informal city”. Data collected as a part of this analysis indicates that 35% of houses in the city are located in risk zones (See Annex III. Urban elements performance overview - Built Environment). However, a disproportionate number of these houses are located in informal areas (60%) that are inappropriate for construction such as flood-prone areas due often to the natural drainage of rainwater. Heavy rains therefore periodically allows for disaster conditions in these areas, sometimes the severity of which results in loss of human life and, almost always, with negative economic implications (which adds even more to the social imbalance of the city).

Just as one can speak of two cities, the formal and the informal, in a spatial capacity, so too can one speak of these two cities in economic terms. The vast majority of the inhabitants of informal neighbourhoods have a daily economic horizon. That is, they buy what they will consume on the same day. According to the information gathered, 98% of households in informal areas make their living through the informal economy. There are countless informal vendors who do business every day on the streets of the city, whether on sidewalks, walking with their merchandise, or even through selling goods from their own vehicles (e.g. providing hot food for employees and workers).

Due to the low purchasing power of the residents in informal areas, any change in the price of common commodities leads to a social crisis such as that experienced in Maputo in 2008. That year, due to the rising price of Tchapas, the city’s population revolted, resulting in episodes of violence that are still remembered today. The government had to subsidise fuel to calm the situation. In more recent years (2012, 2018) there were also significant increases in fuel costs, but they did not have the same social repercussions.

Informality also occupies the majority of the service sector. Professionals who offer their services in the informal economy abound, where there are no fees or taxes, no invoices or receipts. The unemployment rate in informal areas is very high, especially among young people. Many of them, without high professional expectations and with a basic education, struggle to participate and collaborate in the daily life of the neighbourhood. The problems of alcoholism, drugs, violence, and insecurity are well known in various neighbourhoods of the city (further adding to the segregation of these areas).

In response to these issues, there are many NGOs and CSOs working in various neighbourhoods of the city with programs aimed at empowering and promoting young people, engaging them in sports, supporting the creation of small businesses, etc.



**Image 10:** Building in cement city. Source: CRPP (2019).



**Image 11:** Wood and zinc house from the urban periphery. Source: Google images (2019).



## Stress III: Inefficient Management of Urban Metabolism



### Associated Stressors:

- Inefficient water cycle management (catchment, storage and distribution, consumption - drainage/sanitation and rainwater)
- Inefficient solid waste management
- Inefficient management of ecosystems and related infrastructures



Figure 12: Inefficient management of urban metabolism. Source: CRPT (2019).

In the case of this stress, the three stressors referred to will be detailed separately due to the specific nature of each.

### Inefficient Management of Urban Metabolism

**Associated Stressor:** Inefficient Water Cycle Management. Current Scenario

Since water is a limited and vital resource for human beings, a broad view of the entire water cycle is essential, in which three distinct processes can be identified:

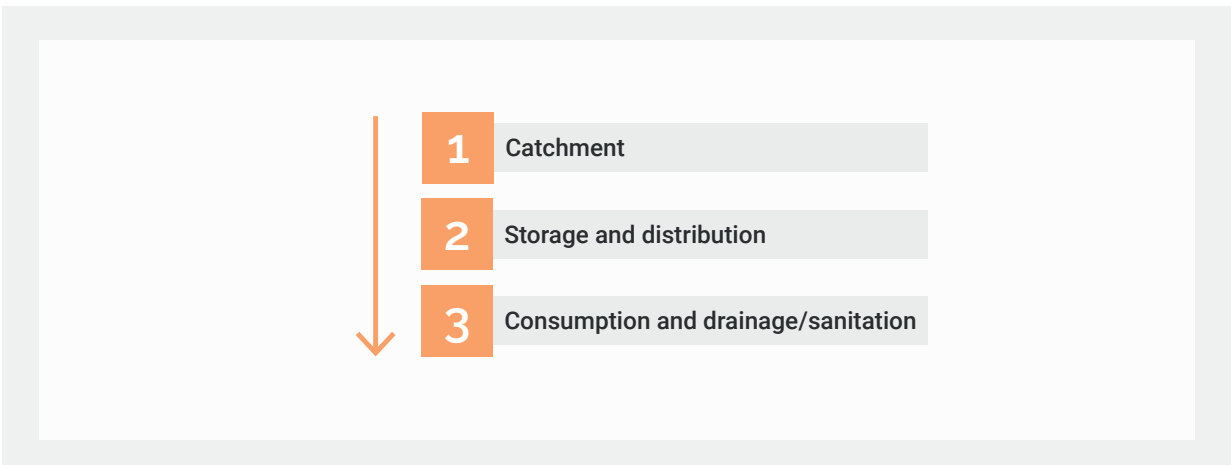


Figure 13: Water cycle. Source: CRPP (2019).

## 1. Catchment

The main source of water supply for Maputo is rainwater, which is stored behind the Libombos Dam, located about 35 km south of the city in the Boane District. This dam collects water from runoff from the mountains bordering the Kingdom of Eswatini and South Africa. It was built between 1983-1987 and has capacity of 350 million m<sup>3</sup>.

This dam serves as a source of supply to the main population centres of the south of the country, including the cities of Maputo, Matola, Boane, and others. Due to population and associated water consumption growth, there is a need to find other sources of supply. Thus, the Corumana dam is being finalised, which will increase the water flow to the cities of Matola and Boane by another 60,000 m<sup>3</sup> per day.

Water supply for Maputo also is derived from extraction through boreholes (groundwater). This system is mostly used in the more rural areas of the city, where population density is lower and there is less risk of groundwater contamination. Drilling is not permitted without permission for public health reasons (cholera outbreaks, etc.). There should be a record of the exact location of each hole, its depth, and an analysis of water quality. This information is especially important to prevent cholera outbreaks and other diarrheal diseases in the city.

## 2. Storage and distribution

Maputo Province, due to its topography and orography, does not have the necessary infrastructure for sufficient water storage. Especially in years of heavy rainfall, millions of litres of rainwater are wasted because they lack sufficient retention and storage capacity.

There are several water storage, treatment, and distribution points in the city, under the responsibility of the Investment and Patrimony Fund for Water Supply (FIPAG). However, the capacity is not sufficient for the existing demand,

so the supply is limited to a number of hours per day, with the formal city being given priority over the informal city. This city dichotomy is once again perceived in the distribution of water.



**Image 12:** Example of integrated water tanks in buildings (in the cement city and urban periphery). Source: CRPP 2019.

In the “formal city”, most buildings have deposit or storage tanks, which guarantee supply when the general network is out of service. This organisational logic is derived from Portuguese times during when storage tanks were integrated into the design of buildings, in certain instances in very interesting ways.

However, due to the increased demand for water due to population growth and increased demand driven by rising livelihoods (e.g. the increased use of washing machines), many buildings have increased their storage capacity by installing plastic tanks. Without going into aesthetic and practical issues, these systems generate a great deal of water loss, as pumps often operate even when tanks are already full. This wasted drinking water is not used for irrigation or cleaning.

The spatial distribution of the “informal city” has led to other water supply systems. Due to the irregular layout of most neighbourhoods, it is not easy to supply individual households (house by house), nor is it easy to read the water meter to collect each customer’s consumption. In these areas of the city, the majority of the population receives water through Small Water Supply Systems (PSAA). PSAA are usually privately managed (although prices are regulated and tariffs are lower) and are registered by the authorities, which ensure that the water quality is appropriate for human consumption.

It is a system that requires more human effort (mostly people have to go buy water and transport it themselves<sup>10</sup>), but on the other hand, considerably minimises the water waste. Individual connections to a PSAA are also common, but only up to a certain distance.

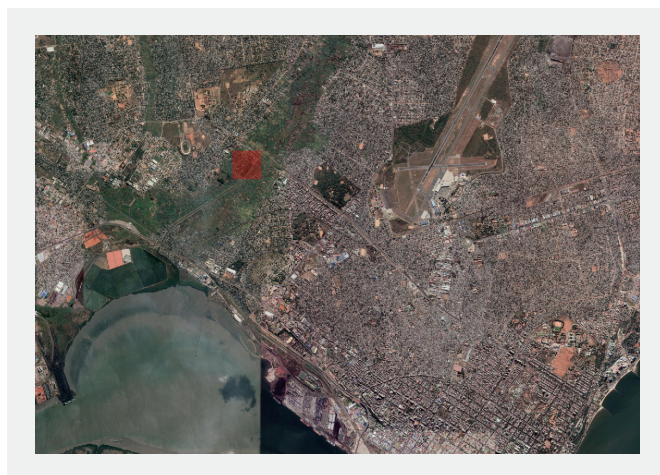
Finally, in the more rural areas (Ka-Tembe to Ka-Inhaka), the manual boreholes coexist with the PSAA, whose characteristics (maximum distance, location of possible polluting sources, etc.) are more oriented to rural sources. Population dispersion in these areas and low population density do not justify a public piped water network (due to high construction and maintenance costs). However, with increasing demand for land and corresponding increasing population density (mainly in Ka-Tembe), the situation may change.

### 3. Consumption and drainage/sanitation

The public water network, with individual water meters, is limited to the “formal city”. PSAA operates in the urban periphery.

While there is a public sewage network in the city, only Urban District 1 benefits from this infrastructure. Most of the existing buildings in the “cement city” were built with separate sewage networks for black water (faecal) and white water (sink, rain, kitchen water, etc.). The former is deposited into septic tanks and the latter in drains. Subsequently, it is necessary to periodically empty the septic tank and transport the faecal sludge to the sewage treatment plant (WWTP). This service is performed by private providers.

A similar system is carried out in the “informal city”, where individual latrines/pits are emptied with more basic methods (drainage pumps brought to homes manually). The final disposal of faecal mud taken from latrines/pits is also at the WWTP.



**Figure 14:** Location of WWTP in the City. In relation to the Infulene River valley (garden area) Detail of the infrastructure.

Source: CRPP based on information provided by google maps (2019).

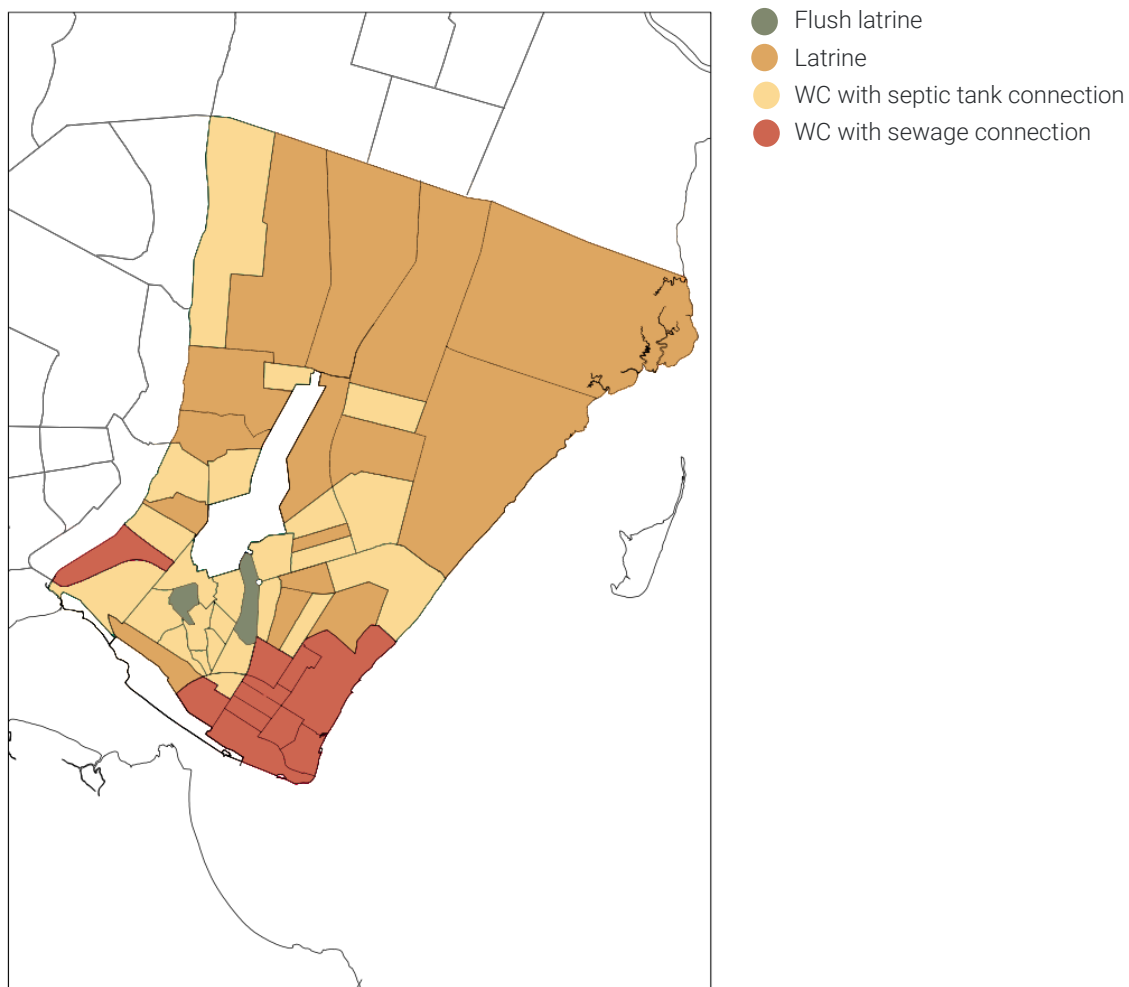
<sup>10</sup> Often 25-30 liter plastic tanks that also serve as home storage.

Finally, in the more rural areas of the city, traditional sanitation systems (conventional or improved latrines) are used and abandoned once flooded. This occurs mainly in schools and other public places.

Regarding rainwater, there is a rainy season in Maputo with slight temporal variations. Most of the precipitation occurs between November and March. In the city, this free supply of the precious liquid is seen more as a problem (from the damage it causes due to its poor drainage) than as an opportunity to collect drinking water and positively impact the city's ecological footprint.

Although there is no specific data on the storage and use of stormwater, it can be considered that there is no collection, storage, or use of this water. Many of the colonial-era buildings in the "formal city" have rainwater collection systems, although most have fallen into a state of disrepair due to lack of maintenance.

There are several open drainage ditches intended to capture and redirect stormwater that cross certain areas of the city. However, they are often clogged by refuse, the accumulation of sand, plants, and other objects, and lack maintenance, hindering their effectiveness.



**Figure 15:** Sanitation map of Maputo. Source: CRPP based on information provided by PEUMM 2008 (2019).



## Inefficient Management of the Urban Metabolism

**Associated Stressor:** Inefficient Solid Waste Management. Current Scenario

Municipal waste collection service is organised differently than water supply as the starting point of the service is the Municipality and the final point, the municipal waste disposal site (dumpster).



**Figure 16:** Solid waste cycle. Source: CRPP (2019).

### 1. Solid waste cycle. Source: CRPP (2019)

This category considers the garbage produced by citizens in their daily life in the city (papers, small bottles, soda cans, etc.). Particularly significant points for this type of garbage are schools and informal and formal retail outlets.

There are no trash bins in the city, although there are groups of CMM waste collectors who usually collect trash in the early hours of the day in the “formal city”. In addition to the negative visual impact, uncollected refuse poses a serious problem due to its propensity to clog gutters and drainage ditches. There is frequent flooding of some streets and squares for this reason.

Placement of buckets in the city (and especially in areas prone to frequent flooding) could minimize this problem, although it would represent an increase in CMM expenses.

Undoubtedly, this problem could be solved almost at no cost if Maputo citizens felt that public space is everyone's space and not any one individual's space. Citizen awareness must be created and intensified, especially with young people, along with the promotion of a shared vision of belonging to the city and seeing it as a point of pride.

### 2. Garbage Collection: Private Ordinary Trash

It is the trash produced by the citizens in their homes, commercial places, etc. There is no separate waste collection in Maputo because the only destination of the collected waste is the municipal waste collection site (along with other unauthorised places).



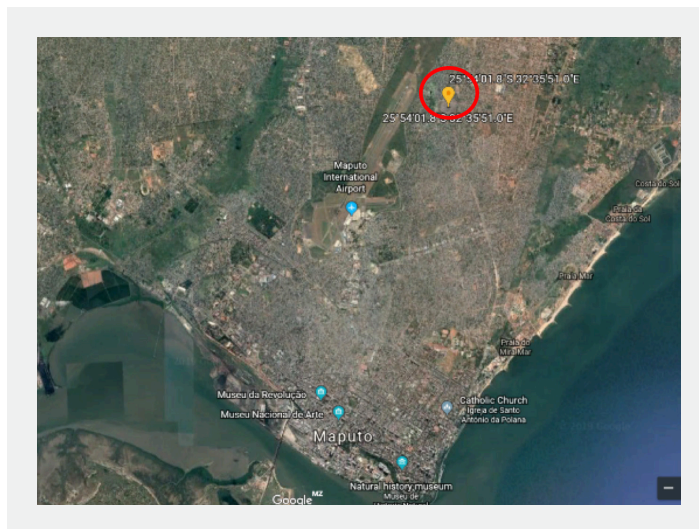
**Image 13:** Contaminated garbage (car oil) in a peripheral neighbourhood, without proper treatment or storage system - ground filtration and contamination. Source: CRPP (2019).

Due to a lack of waste collection facilities, part of the collection service is outsourced, depending on the area of the city. In the "formal city" residents dispose of the garbage in plastic containers installed by the Municipality, although the amount often overflows the capacity of the containers. The garbage is collected by a private company, contracted for emptying the containers, and moved to the disposal sites. In the "informal" city, the majority of collection is carried out by micro-enterprises, contracted by CMM for each neighbourhood. Micro-enterprises usually operate 2-3 times a week, and are responsible for collection in a certain area. Waste is deposited in metal containers that are periodically changed and emptied. In Katembe and Ka-Inhaca Districts, waste is disposed of in informal dumps.

### 3. Waste collection: Hazardous or Contaminating Waste (Hospital, Chemical, Industrial, etc.)

Due to the specificity of the treatment of each type of waste that poses a threat to health and even life, it is mandatory to identify the points that generate this type of waste throughout the city. Cross-checking between various departments and administrations is necessary to correctly identify each of these polluting agents and to periodically update compliance with any special measures they may require.

The start of new activities that may have consequences for the type of waste they produce should consider the incompatibility of the activity with the environment in which it is located.



### 4. Final Deposition

The final arrival point of the waste is the Hulene municipal waste dump, located in the Kamavota Municipal District. There are other garbage disposal points, but they are informal, without CMM's ability to control them.

Hulene's dumpster is completely surrounded by homes, which poses a serious health threat to the surrounding population (smell, contaminating water, smoke from burning of waste, among others). There is no safety buffer zone around the dumpster, which resulted in a tragedy in February 2018 when part of the trash heap collapsed, destroying several houses and killing 17 people.



**Figure 17:** Location of the Hulene Dumpster in the City (left). Dumpster surrounded by residences, without any kind of safety distance (left). Source: CRPP based on information provided by google maps (2019).

This tragedy was the culmination of a longstanding and widespread problem. Following the incident, it was decided to close the Hulene dump, although it was not determined where to locate the new municipal dump. Without considering the Katembe and Ka-Inhaca Districts, the Municipality has a clear space limitation for the location of such large-scale facility due to the environmental consequences that a dump has in the area around it. Authorities have begun to consider that this problem needs to be addressed on a larger scale at a supra-municipal level.

This way well be possible given the interdependence of the Maputo and Matola municipalities. Having created the Metropolitan Transportation Agency, the door is already open to consider other areas of concern (such as waste collection) and to conduct a joint effort to find solutions between the two municipalities.

## Inefficient Management of the Urban Metabolism

**Associated Stressor:** Inefficient Management of Ecosystems and Related Infrastructures. Current Scenario

Rapid population growth in Maputo began in the 1930s and 1940s. Growth occurred primarily along the major axes of the city, and quickly become disorganised the neighbourhood level (as explained in previous section). The increase in population, with the need to build houses (typically made of wood and zinc or reeds), led to intensive use of these resources in the area, exacerbating, and in some cases causing periodic flooding in the city, especially in the outlying neighbourhoods.

From the 1950s onwards, major infrastructure was developed in the city, which considerably changed its topography. As shown in the images below, there was still attention given to coastal protection as infrastructure was built, although at that time there was not the urban pressures on the beach areas (these areas are now Costa del Sol).

However, it was after independence and during the years of the civil war (1976-1992) when there was the greatest pressure on the territory and almost no concern for the medium and long-term consequences. Maputo's growth in recent decades has resulted in a continuous attack on the environment and existing ecosystems. The following images show the land use index from 1964 to 2008, highlighting the disappearance of the entire lagoon/mangrove area near the coast.



**Image 14:** Earthworks for the construction of the descent road to Baix.

Source: Maputo Municipal Council Photographic Archive.



**Image 15:** Photograph showing natural vegetation as a grounding element.

Source: [www.delagoabayworld.wordpress.com](http://www.delagoabayworld.wordpress.com)

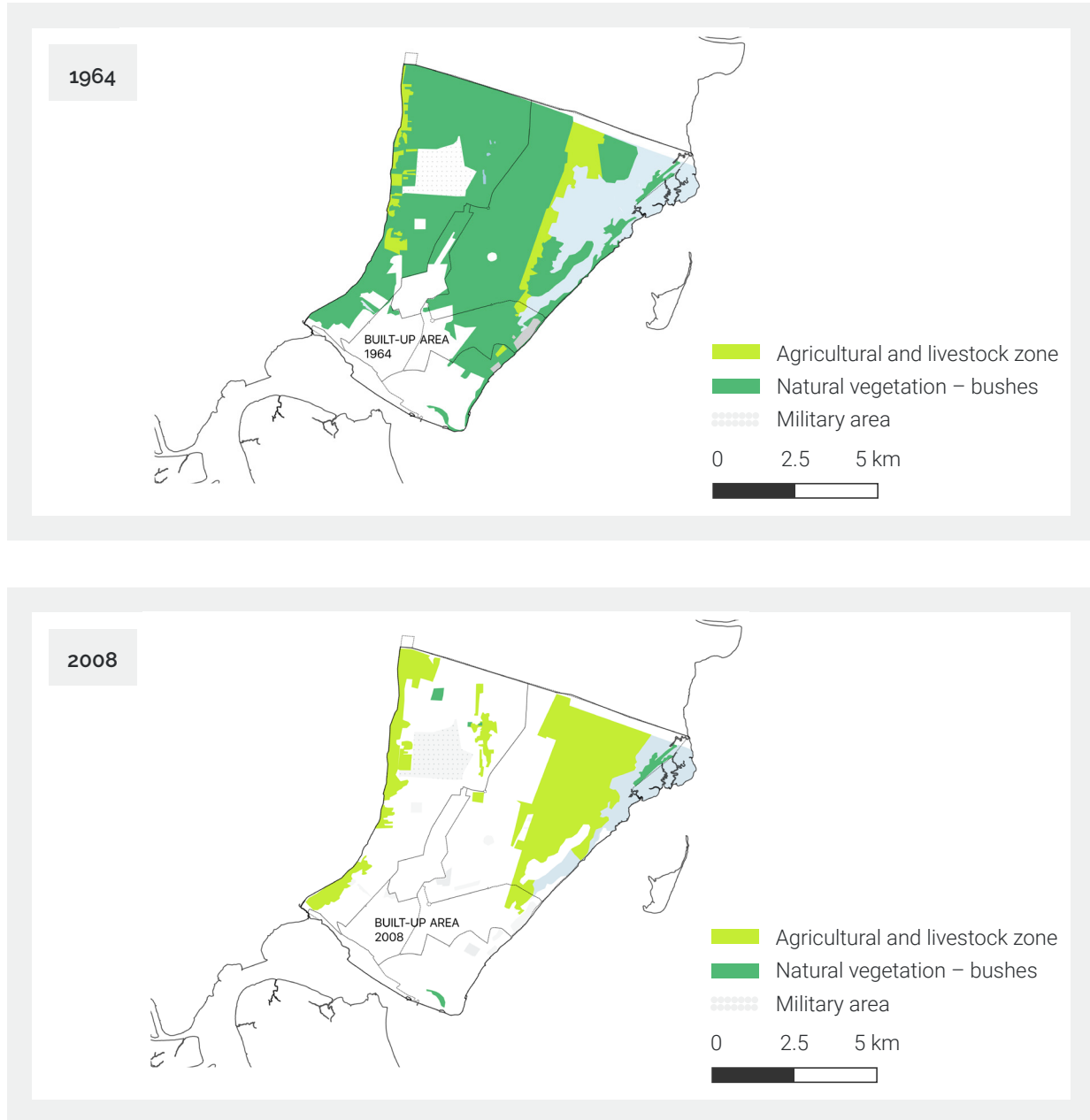
The coastal strip has experienced urbanistic pressures that are unique in the city. The construction of luxury buildings for the upper classes is underway, while much of the population of the underprivileged strata builds on the “second beach line”, on floodplain, and on other land totally unsuitable for housing (e.g. the tidal water discharge channels).

From 2011, when the construction of the Maputo Circular (a ring road linking Av. Marginal with EN-4) began, environmental problems become even more serious. The road was built on top of a landfill, with not enough provision for pipes to allow for needed drainage and runoff. Problems of flooding in neighbourhoods are frequent and periodic pumping is necessary to prevent stagnant water and associated health issues (i.e. malaria).

Other environmental problems affecting the peripheral neighbourhoods of Maputo are a consequence of the low economic status of the residents. For many years now, residents have been digging sand for the construction of their homes, creating huge pits that become garbage dumps and stagnant water accumulators (which also contribute to malaria outbreaks). It is also this population that cuts down the mangroves and the few trees that exist in the area for building and for cooking. Numerous civil society and collective organisations spend time warning of the dire consequences this exploitation will have on the environment and ecosystems but have thus far had little success in changing behaviours.



Environmental issues are of particular importance in those areas in which there is still hope. Katembe and Ka-Inhaka are located in the more rural parts of the city. These areas must be protected, taking into consideration the lessons learnt from the rest of the city. The pressure that Katembe is under is especially severe considering it is a primary area of expansion and growth in Maputo. The CMM should make a special effort to ensure compliance with existing plans and legislation. Ka-Inhaka has a special categorisation due to its characteristics that classify it as a natural reserve. The Municipality, together with local authorities, residents, and entrepreneurs interested in the district, should be concerned with maintaining its existing ecosystems.



**Figure 18 / 19:** Evolution of land use in Maputo from 1964 to 2008. Source: CRPP based on information provided by “Maputo, cinco décadas de mudança territorial. Cristina Delgado Henriques. Editora: IPAD (Instituto Português de Apoio ao Desenvolvimento).



## 1.4 The Current Scenario in context

It should not be forgotten that the purpose of this report is to propose a series of actions to improve the resilience and sustainability of the entire urban system of Maputo. Moreover, for those actions to be correctly oriented they must be contextually designed, not only addressing the weaknesses or deficiencies that Maputo shows in its daily operations, but also with an understanding of the external events to which it is exposed and of the internal constraints of the administration in charge of the city.




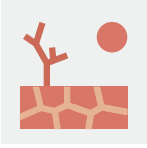



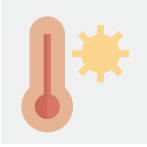

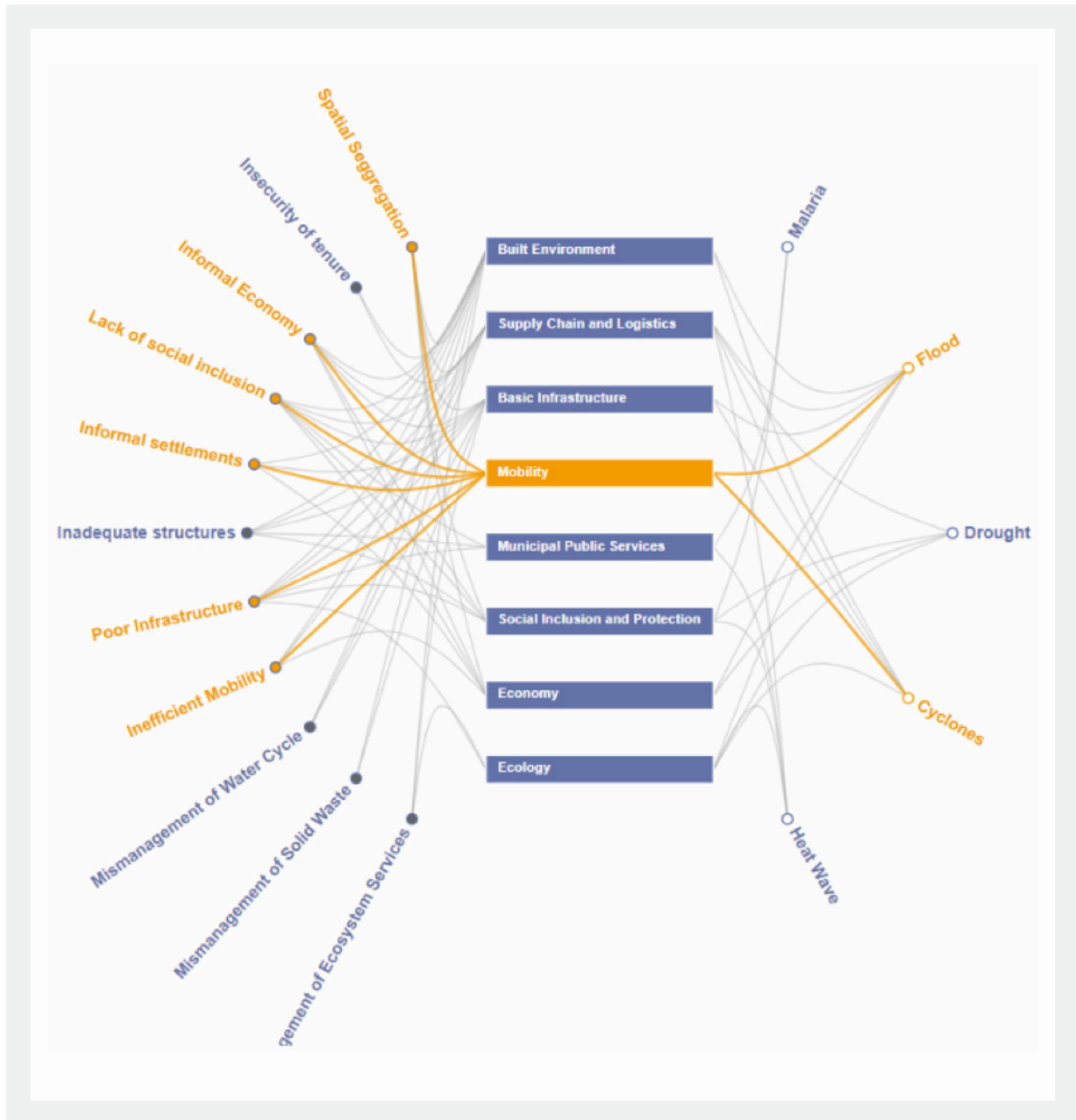
Estresses		Shocks	
	Rapid, Unregulated Urbanisation		Flood
	Socio-economic Inequity		Drought
	Socio-economic Inequity		Cyclone
	Inefficient Management of Urban Metabolism		Heatwave
			Malaria

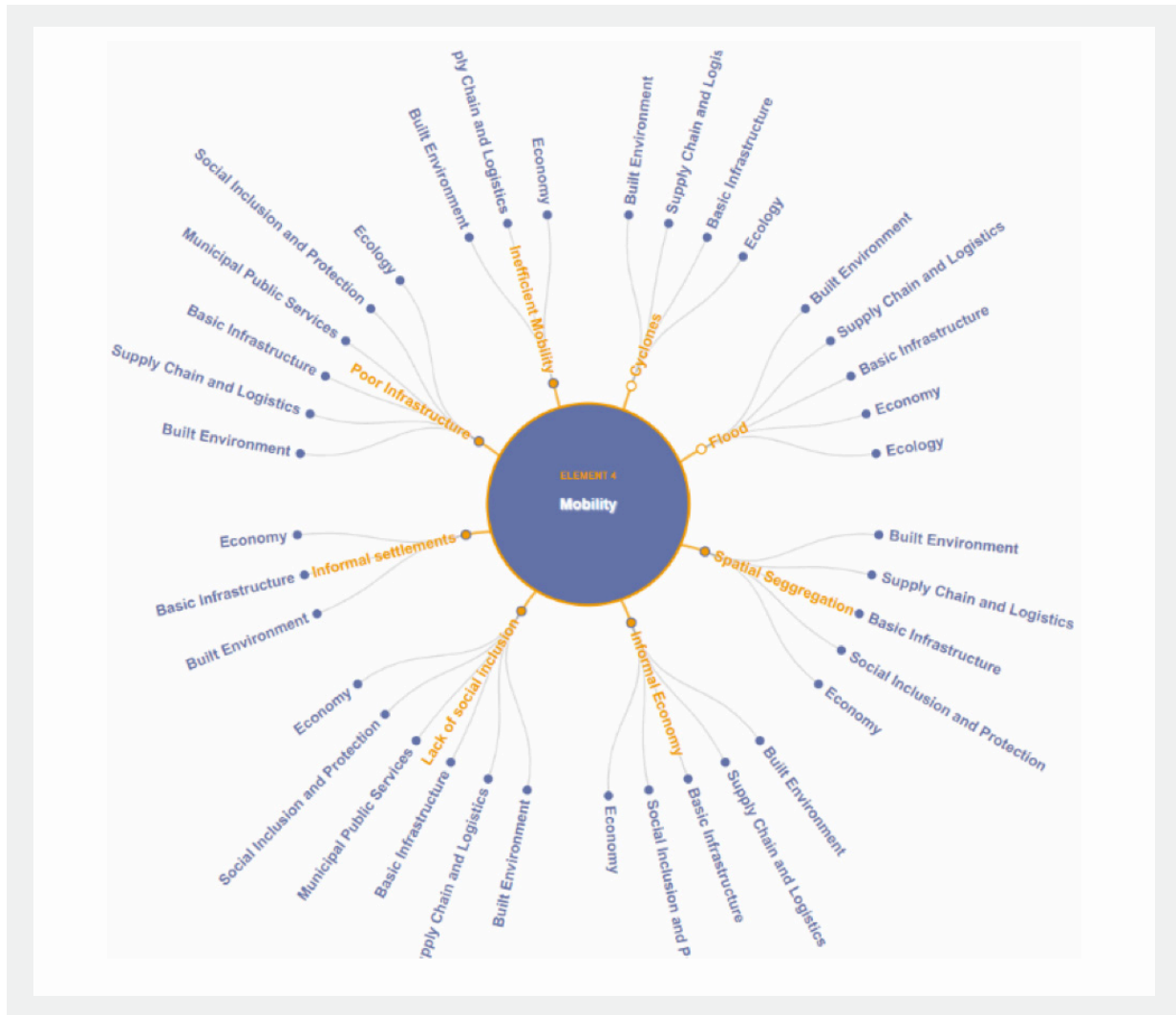
Figure 20: Conclusions of the Current Scenario (Stresses and Shocks). Source: CRPP (2019).

## Contextualisation of stresses in relation to shocks

As a conclusion of the Current Scenario, it can be stated that the identified stresses (together with the combined stressors) affect the daily operability of the city. At the same time, Maputo recurrently suffers a series of external events (shocks), which have also been identified and prioritised throughout the data collection process. The relationship between stress and shock is not simple, and it is almost impossible to isolate one from another (as depicted by figures 21 and 22).



**Figure 21:** Mobility as an Urban Element and its relationship to identified stressors as well as to prioritised shocks. Joint vision of the Urban Element Mobility, relating it to the stresses/stressors and shocks that directly affect it, which in turn influence others. Source: CRPT (2019).

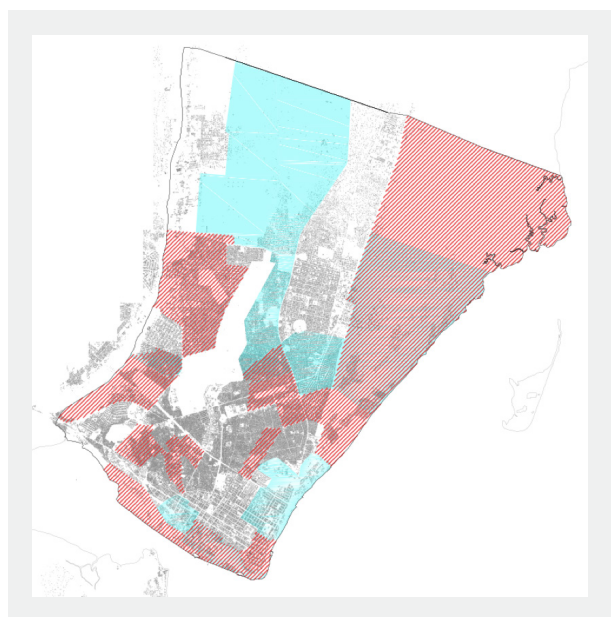


**Figure 22:** Mobility as an Urban Element and its relationship to identified stressors as well as to prioritised shocks. Joint vision of the Urban Element Mobility, relating it to the stresses/stressors and shocks that directly affect it, which in turn influence others. Source: CRPT (2019).

It can be observed that there is a relationship between stresses and shocks, and it can be expressed as follows:

- Stresses increase the vulnerability of the city to potential shocks
- Shocks see their impacts compounded by the stresses that the city suffers.

It is important to recognize this relationship as the proposed Recommendations of Actions for Resilience and Sustainability should reduce vulnerability and help mitigate the impact of an external event. Consequently, the city's ability to regain its pace of performance must be improved.



**Figure 23:** Areas prone to flooding (blue) overlapping the main critical rainwater drainage areas (dashed in red). Source: CRPP based on information provided by PEUMM 2008 (2019).

## Contextualisation of stresses in relation to local conditions

Identified stresses, stressors and shocks must to be placed in the general context of Maputo Municipality governance structure and processes in order to take into account contextual constraints, which are crucial to structuring action-oriented strategies. Contextual constraints are in fact conditions that, when properly directed or oriented, can be harnessed to reinforce the resilience of the city.

These conditions are:

- **Legislation:** Currently in relation to existing legislation, existing and/or planned and/or approved plans and policies.
- **Human resources:** The existing Municipality staff, its structure and organisation (looking at the need for coordination between some departments / directions as well as to avoid overlap or duplication of efforts).
- **Information management/institutional memory:** The memory or information management capacity that the Municipality has (linking the two previous conditions), as people may be transient but institutions remain.
- **Replication and dissemination of best practices:** Successful experiences or actions that are ongoing or have already taken place, with a view to continuing or replicating them.
- **Accountability of actors:** The Municipality's role as city manager, sharing duties and responsibilities with residents and the private sector.

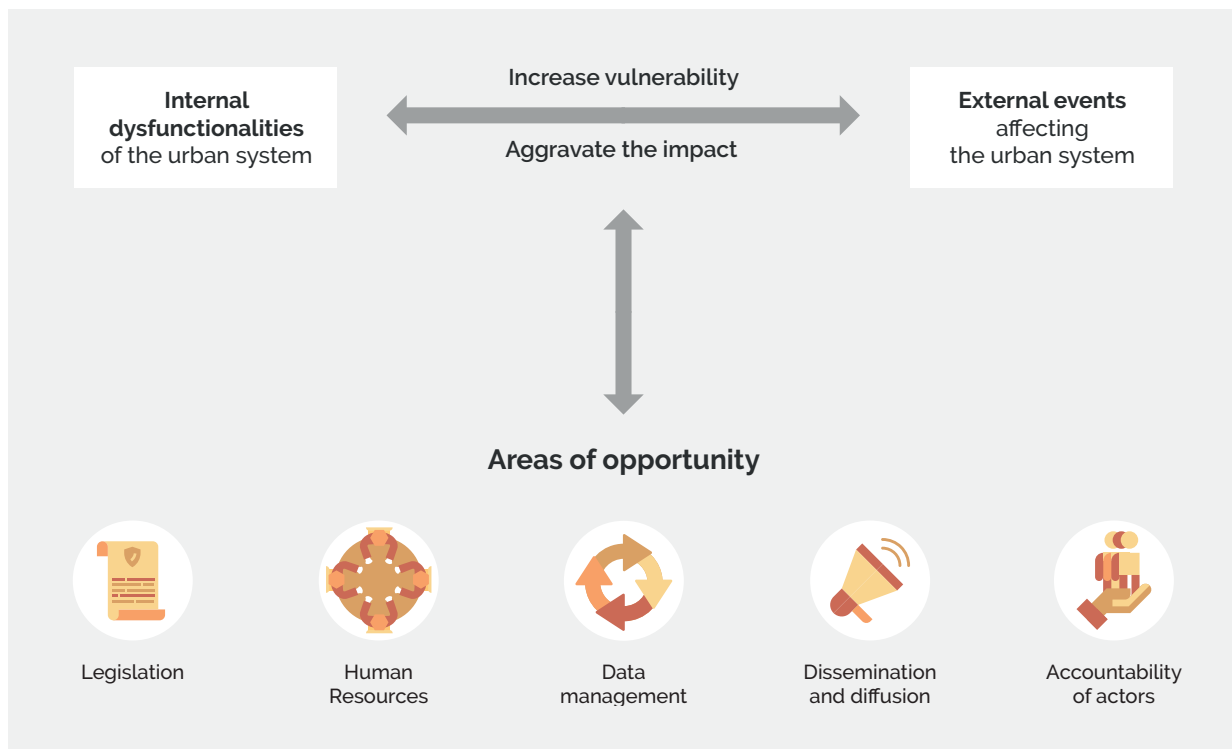
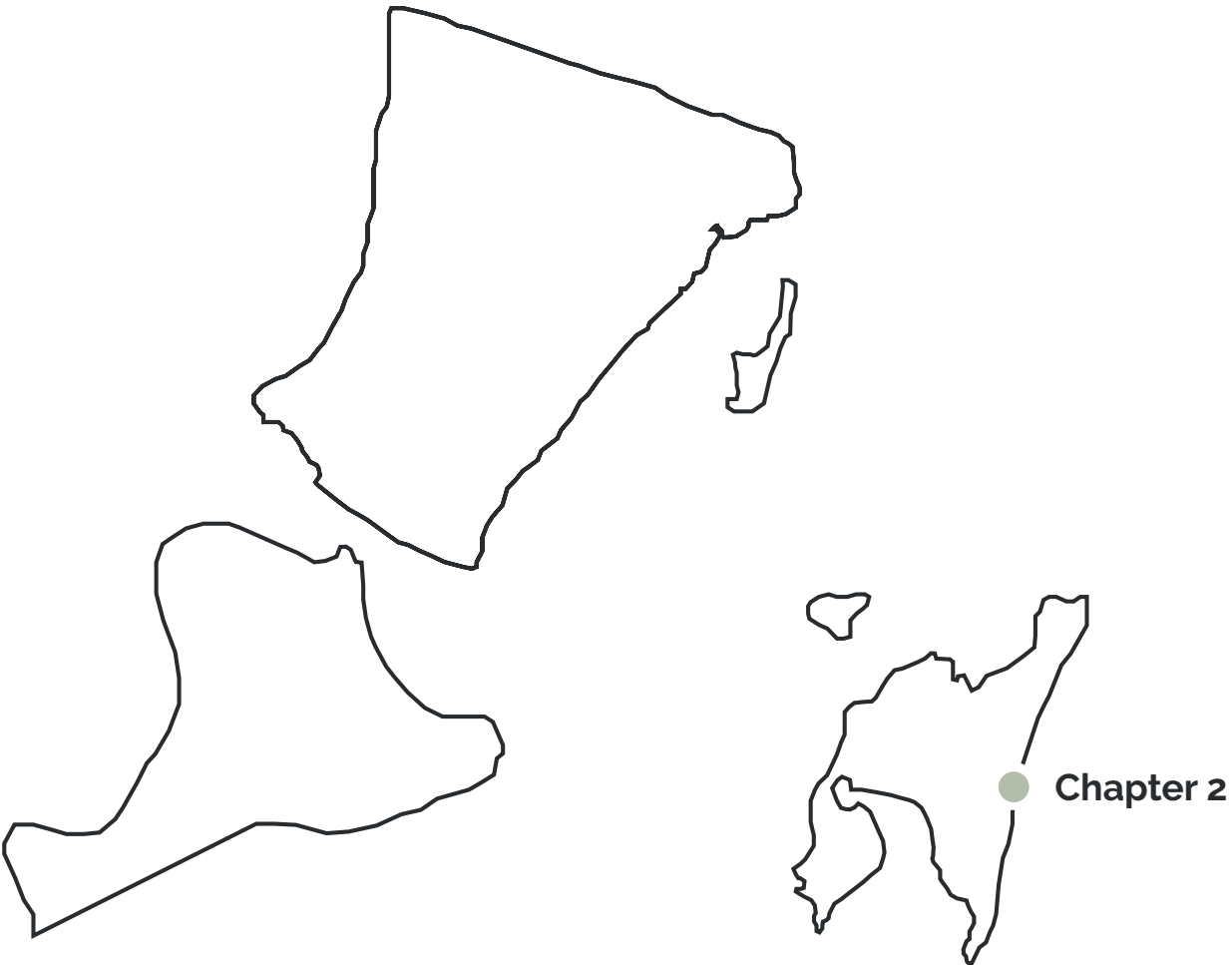


Figure 24: Linking shocks and stresses with other constraints or areas of opportunity. Source: CRPT (2019).





# Chapter 2

## Trend Scenario

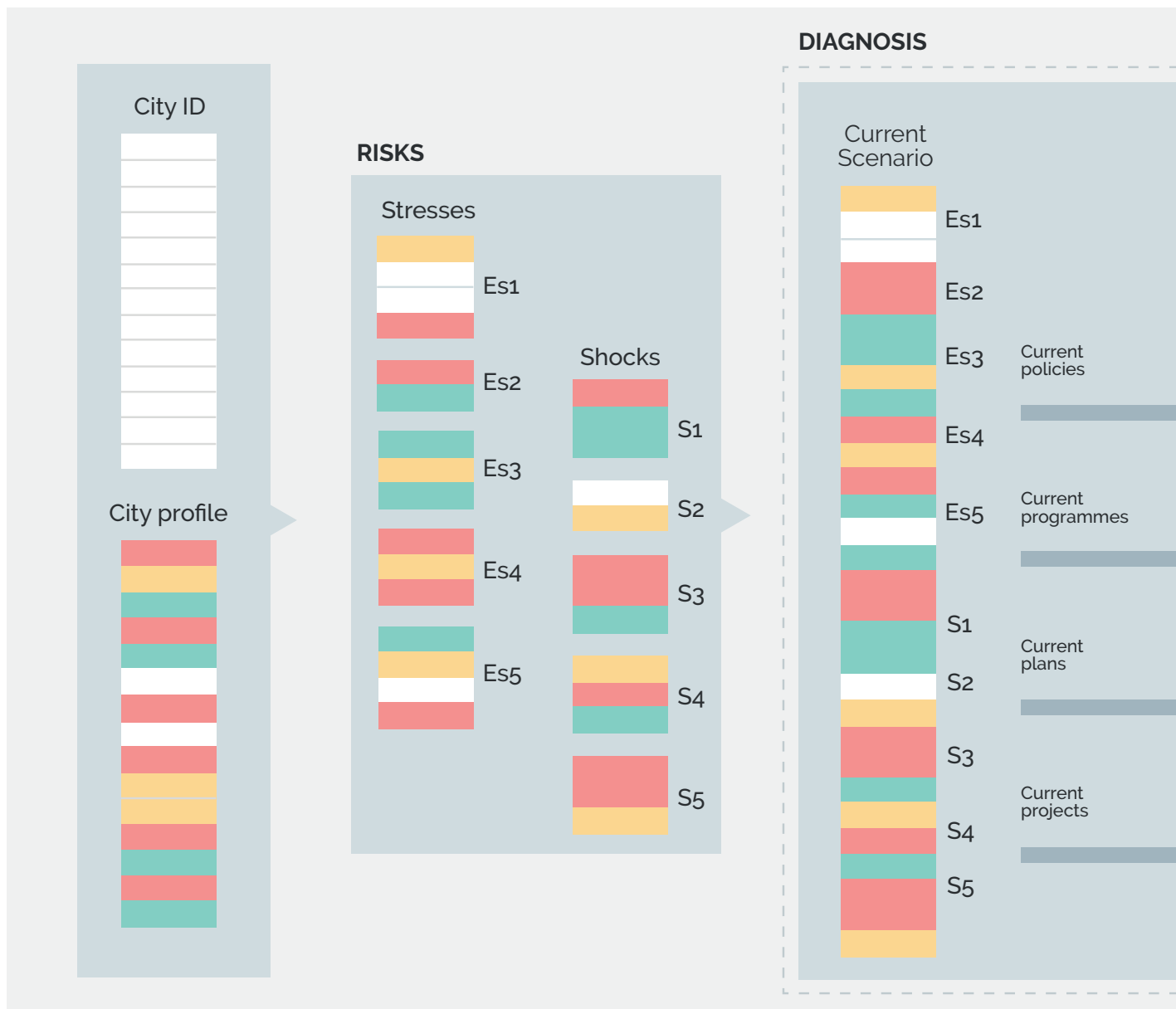
# Chapter 2

## Trend Scenario

### 2.1 Construction of the Trend Scenario

This is a step forward in strengthening Maputo’s resilience by considering the current situation (Current Scenario) - its weaknesses and strengths; trying to maintain (and/or replicate) the beneficial practices that exists and change or improve those facets which are less beneficial.

As stated in the explanation of the CRPP methodology, the Trend Scenario emerges when applying the policies, plans and strategies prepared and / or approved to the Current Scenario, as these documents "direct" the path by which the city will be headed.

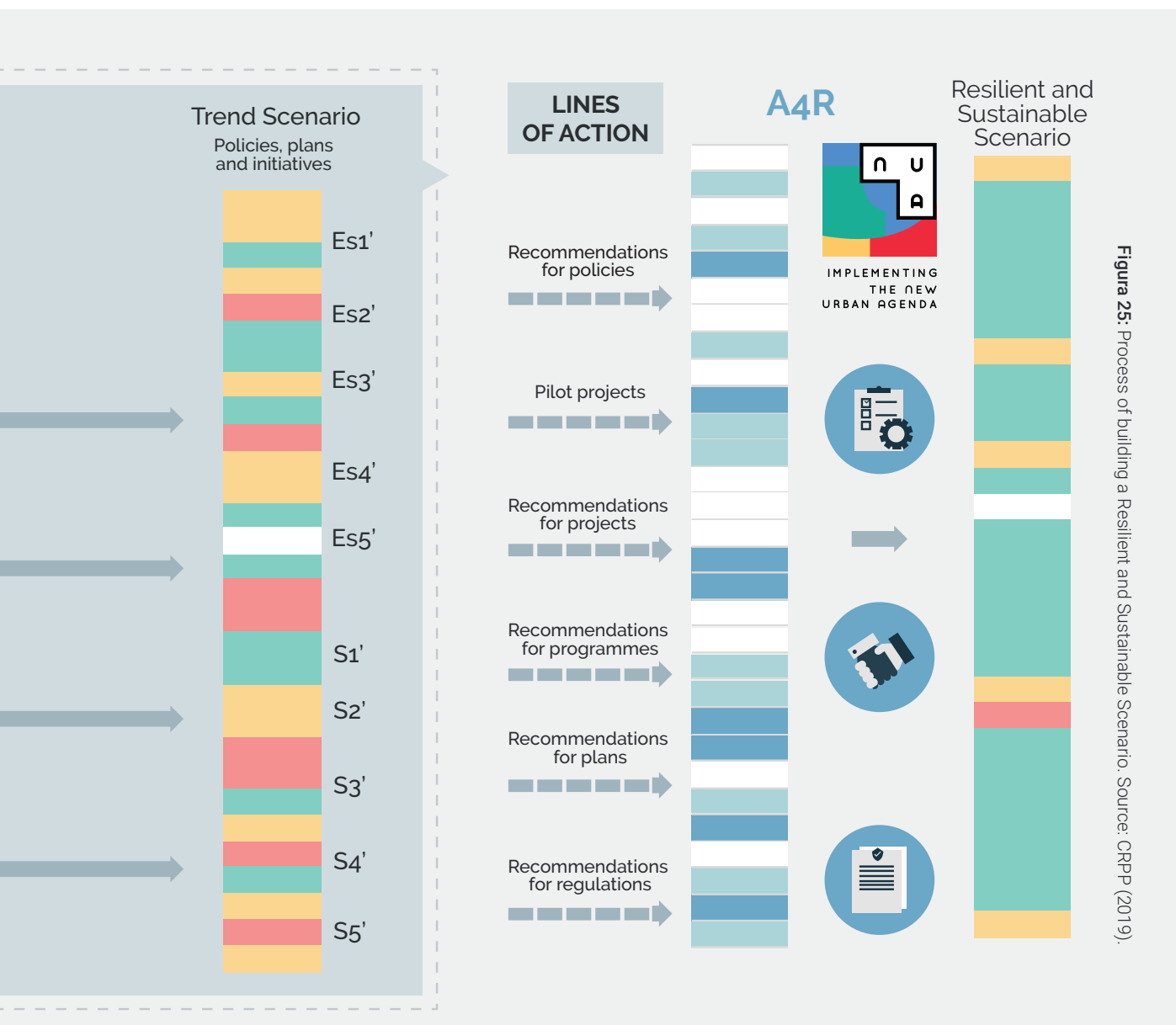




As **figure 25** shows, application of existing plans, policies and projects to the Current Scenario would change the situation of the city completely: it would considerably increase the number of 'green' indicators, or areas within which the city is operating in a satisfactory situation. (See **Appendix 2. Current Scenario: selection of indicators and their relation to shocks and stresses in Maputo**).

However, it is not the lack of plans, policies and strategies that holds Maputo in its present state. Mozambique is a country with very advanced legislation and Maputo is a city where numerous studies, research, plans and strategies have been carried out. But all of this, unfortunately, is often forgotten in the drawers of a desk or on the shelves of departments because there is a lack of ownership, a plan was not designed for sustainability, or the funds are not available and the project is no longer possible to replicate.

Several existing documents (policies and strategies) have been approved and are being implemented (with more or less success) in the different detailed areas have already been mentioned when discussing stresses. There has also been a review of significant documents - policies, strategies, legislation, etc. - (See **Appendix 5. List of Policies, Plans and Initiatives**), which underpins each of the Urban Elements analysed in the data collection. However, many of the technicians in specific areas are unaware of this review and their compliance and effective application of plans, policies, and initiatives is therefore far below a desirable level.



Regarding resilience, it can be said that the situation is not very different than that of the review of significant documents. Resilience has become a fashionable term (unfortunately even more so after Cyclone Idai, which devastated Beira City in May 2019), and Maputo has already benefited from studies and analysis on resilience; but said benefits have not extended to implementation.



**Figure 26:** Resilience and emergency. Source: CRPP (2019).

It is still common today to confuse the concepts of resilience and emergency. There is a misconception that a resilient city is one that responds to emergencies promptly, regardless of its ability to recover after a disaster; or a resilient city is “lucky” since emergencies hardly ever occur. The close relationship between the two concepts is explained in the following graph, making clear the inversely proportional relationship that exists between them.

To get a more resilient and sustainable city:

- This is not about creating new laws; it is about applying the ones that already exist.
- It is not a matter of preparing another study or analysis. It is about seeing the applicability of those that have already been completed considering aspects that, perhaps, were left aside: the sustainability and the actual capacity of the Municipality.

Based on this perspective of analysing the existing strengths that the Municipality possesses, efforts that are successfully performed in the priority areas (identified stresses), and an understanding of the importance of the sustainability of any intervention, Actions for Resilience (A4R) are proposed. These are grounded actions that envision the shared responsibility of various key actors and aim not to improve the resilience of the city overnight, but from the inside out.

## 2.2. Relationship of Stresses (and Stressors) to installed capacities and the existing legal framework



### Stress I: Rapid urbanisation without regulation

**Combined stressors:** informal settlements, inadequate (insufficient) coverage of basic infrastructure, and inadequate structures caused by inadequate compliance with laws and regulations.<sup>11</sup>

List of key documents (legal and strategic) and their relationship to each of the stresses, as well as actions that the Municipality has implemented or is carrying out, placing the city in a more resilient and sustainable position.

- The CMM does not have the ability to oversee each corner of the Municipality, but the responsibility could be shared if residents and neighbourhood-level authorities assumed their role in the functioning of the city. As established by the Spatial Planning Policy and its Spatial Planning Law (LOT-19/2007) and the LOT Regulation (in Decree 23/2008) regarding the elaboration of the PEU, Detail Plans, etc., participation from communities is fundamental because communities know the local realities best. However, their role should not stop at the initial stage of identifying, planning, and proposing initiatives in their area; but expand to include oversight and supervision of the implementation of these actions to ensure compliance with the agreed upon legal framework in effect.
- Decree 7/2016 approves the Regulation of Law 15/2014, establishing the legal regime of Disaster management. Article 30 specifically states that "in duly demarcated and signposted risk zones, the DUAT may not be assigned, and the construction of infrastructure shall be prohibited". The Maputo Municipality Urban Structure Plan (PEUMM) identified these areas, but due to land demand as well as lack of rigor in law enforcement, many areas of Maputo periodically suffer from problems arising due to their location. For instance, the proximity of homes to the Hulene dump, without respecting safety distances, resulted in 17 deaths following its collapse in 2018 (as explained above).
- There is also legislation that allows residents to ask institutions questions that may be of interest to them (Law 34/2014 and Decree 35/2015) while respecting the privacy policy. However, citizen participation seems to take the form of simply meeting the minimum established by the law (i.e. community consultations) without any actual commitment from either the community or the Municipality. Citizens and the Municipality must work together for the development of the city, as both are interested in improving people's living conditions.

<sup>11</sup> See Appendix 3. List of shocks, stresses and stressors.

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- Since PEUMM was adopted in 2008, there have been a number of advances including but not limited to:
    1. Establishment of Urban Districts and corresponding structures
    2. Approval of the IA intervention strategy (in 2010), with three lines of action:
      - Neighbourhood improvement
      - Massive regularisation of DUATs
      - Intervention in risk areas
    3. Joint interventions with other actors to improve existing infrastructure:
      - Wateraid and Wasup - improved sanitation (community toilets)
      - Architects Without Borders - urban planning (street extension) under the HABITAT Project - "Defending the right to access to the city through participatory urban reorganisation and access to title DUAT in the informal districts of Maputo" (in different phases since 2015).
      - Creation of a GIS database under the SEC-GD Project - Urban Action Plan George Dimitrov's, gender-responsive and participatory, to improve connectivity and secure accessibility to collective spaces (equipment and services, transport, public spaces and areas of tertiary activity).<sup>12</sup>
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<sup>12</sup> SEC-GD Project: Department of Urbanization and Territorial Ordinance of UPC • BcnTech. Local partners: CMM and UEM Faculty of Architecture and Physical Planning. Contact: maputo.etsab@upc.edu; arwen.p.gumbao@upc.edu / Funded by the Barcelona City Council and UPC Cooperation Center • BcnTech.



## Stress I: Rapid urbanization without regulation

**Associated Stressor:** Mobility

List of key documents (legal and strategic) and their relationship to each of the stresses, as well as actions that the Municipality has implemented or is carrying out, placing the city in a more resilient and sustainable position.

- Need of the stressor to consider the greater Maputo area as a whole, its installed capacities, and its legal framework.

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- Given this interrelationship and the need for joint work, the Greater Maputo Area has been defined as including Maputo city, Matola, and Boane municipalities and a part of Marracuene District.

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- Another result of this more inclusive approach was the creation of the Metropolitan Transport Agency in 2018, which operates under the responsibility of the Ministry of Transport and Communications and seeks to coordinate actors involved in mobility issues in the Greater Maputo Area. Since its inception, this agency has been presented with the major challenge of establishing and defining the administrative level of the metropolitan area or region, which is currently absent in Mozambican legislation, a process that can be applied in other areas of the country such as the Beira and Dondo municipalities.

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- Maputo has made numerous efforts to improve urban mobility. In 2013, the Mobility and Transport Master Plan for the Maputo Metropolitan Area 2013 - 2035 was prepared by the Japanese International Cooperation Agency (JICA) and approved by the CMM as a sector development strategy<sup>13</sup>. Since then, actions have been taken at very different administrative levels and in very different areas of focus including but not limited to:
  - Introduction of dedicated public transport lane at certain times of the day.
  - The traffic directions of many side streets have been changed to facilitate traffic.
  - Traffic lights and cameras have been installed (still operating well below desired levels)
  - Improved transport connectivity (e.g. train to bus) - Metrobus
  - New transit stops were built
  - Maputo's Public Transit Map was prepared
  - The introduction of a single transport ticket available to the poor, students and the elderly
  - A proposal for pedestrianisation of Avenida Samora Machel, from the CMM to Plaza 25 de Junho (carried out by the Ajuntament de Barcelona in partnership with CMM, in 2012), was prepared with the aim of recovering the area for the citizen. This action was included in the Ministry of Tourism's Strategic Plan as an initiative that would help leverage tourism in the City in general and the economy of that particular area. The proposal has not yet been implemented due to lack of funding.

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- All of the above actions are a consequence of the Municipality's coordinated work with other actors (cooperation partners, NGOs, ministries, and other administrations) to improve mobility from small neighbourhood streets to the Greater Maputo Area.

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<sup>13</sup> Prioritisation of Public Transport from the case of EN4 enlargement Author: Joaquín Romero de Tejada Review: Mario Forjaz  
Version: 12 March 2018.



## Stress II: Socio-economic inequity

**Associated stressor:** Insecurity of land tenure<sup>14</sup>

List of key documents (legal and strategic) and their relationship to each of the stresses, as well as actions that the Municipality has implemented or is carrying out, placing the city in a more resilient and sustainable position.

- According to the established in Article 109 of the Constitution of the Republic of Mozambique of 1990:

1. Land is state property.
2. The land shall not be sold, or otherwise disposed of, or mortgaged or seized.
3. As a universal means of creating wealth and social welfare, the use and exploitation of land is the right of all Mozambican people.

- In Article 110, the conditions for the Right of Use and Use of the Land (DUAT) are determined:

1. The State shall determine the conditions of land use and enjoyment.
2. The right to use and benefit from land shall be conferred on natural or legal persons having regard to their social or economic purpose.

- Although at the legal level there seems to be security in the “ownership” of the land (or at least the right to its use and exploitation), the reality is quite different. In Decree 60/2006 approving the Urban Soil Regulation, Article 21 establishes urbanisation as an indispensable prerequisite for the attribution of the DUAT, being defined in Article 22 three levels of urbanisation (basic, intermediate, and complete).

**Basic urbanization is established when at least the following cumulative conditions:**

- a. The parcels or plots intended for different uses are physically delimited;**
- b. The layout of the streets is part of a road network that integrates the circulation of cars with pedestrian access to each resident;**
- c. There is water supply in quantity and quality compatible with the uses through dispersed sources, namely public wells, wells or holes;**
- d. The streets are wooded.**

- While the legal elements and instruments have been established<sup>15</sup>, their applicability in practice is not common. Currently, Maputo Municipality refers to its Urban Structure Plan, as well as general and partial urbanization plan, and at the most granular level, detailed plans. However, the population living in informal areas faces issues surrounding land tenure insecurity which are a direct consequence of the lack of planning and basic infrastructure (with the Municipality being responsible for both).

<sup>14</sup> For Stress II (socio-economic inequality) and associated stressors (spatial segregation - zonification - lack of social inclusion - informal economy) no relevant information on the legal framework could be found.

<sup>15</sup> Decree 60/2006 of 26 December 2006, Urban Soil Regulations (art.5).

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- There have been several CMM initiatives to improve the situation in informal neighbourhoods:
    - In 2010 the CMM drafted its Municipal Strategy for Intervention in Informal Settlements and its Action Plan. One of the main thrusts of this plan is the massive regularisation of DUATs, which has been taking place in various areas of different neighbourhoods of the City (Albasine, Ferroviário, and Laulane in DM 4 and Magoanine and Zimpeto in DM 5.
    - Since 2015, Architects Without Borders, in collaboration with CMM, have been implementing the UN-HABITAT Project (phase I and II are finalised; phase III is still in implementation) "Defending the Right to Access to the City through the participatory urban reorganization and access to the DUAT title in the informal neighbourhoods of Maputo".

The ultimate objective of this intervention is to obtain the DUAT from the population living in implementation area of the project. This has so far been achieved in some areas of Maxaquene and Chamanculo C.

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## Stress III: Inefficient management of urban metabolism

**Associated stressor:** Inefficient water cycle management

List of key documents (legal and strategic) and their relationship to each of the stresses, as well as actions that the Municipality has implemented or is carrying out, placing the city in a more resilient and sustainable position.

- In Mozambique, the Ministry of Public Works, Housing, and Water Resources (MOPHRH) is responsible for all matters related to water and sanitation, specifically the National Directorate of Water and Sanitation (DNAS) and the National Directorate of Water Resources (DNRH). In November 2011, the National Urban Water and Sanitation Strategy (2011-2025), aligned with the MDGs was approved, outlining the main objectives of the sector, as well as the main lines of work and the existing legal framework:
    - Water supply: achieve 70% coverage (6.6 million people) by 2015 and universal coverage by 2025.
    - Sanitation: increase coverage in 2015 to 67% (6.3 million people) and universal coverage by 2025.
- 
- The main actors in the sector are:
    1. FIPAG - Water Supply Heritage and Investment Fund (1998), whose main responsibility is to invest and ensure the operation of the main water supply systems.
    2. AIAS - Water and Sanitation Infrastructure Administration (2009), responsible for secondary water supply and sewage systems in all urban areas.
    3. CRA - Water Supply Regulatory Board (1998), regulates water service operations and relations between FIPAG and the private operator.
- 
- The Regional Water Administrations (ARA Sul for Maputo) is responsible for overseeing national and supranational (river basin management) objectives.
- 
- Considering the importance of water in human life, both in sufficient quantity and with the necessary quality, as well as the need to ensure healthiness regarding human waste, it is worth highlighting some actions involving not only the CMM but other administrations and partners:
    - Construction of new dams in Maputo Province to increase water storage capacity
    - Alignment of actions with MOPHRH's National Urban Water and Sanitation Strategy 2011-2025
    - Approval of the Sanitation and Drainage Posture (Resolution 68 / AMM / 2016)
    - Preparation of the Sanitation and Drainage Master Plan of the Maputo Metropolitan Area (2016-2040)
    - Support for specific water and sanitation projects (drainage ditches, construction of community toilets, etc.), mainly in peri-urban areas.
- 
- Given the importance of water and awareness of its often poor management, Ministerial Order on 7 October 2005 established the obligation to collect rainwater in all newly constructed public buildings as well as the progressive adaptation of existing buildings. As noted previously, water collection is not conducted in most buildings. However, some sectors (e.g. education and health) require the collection of rainwater using a system that usually consists of gutters and plastic tanks. However, due to lack of maintenance and care by users, these systems often end up being useless in a short time.
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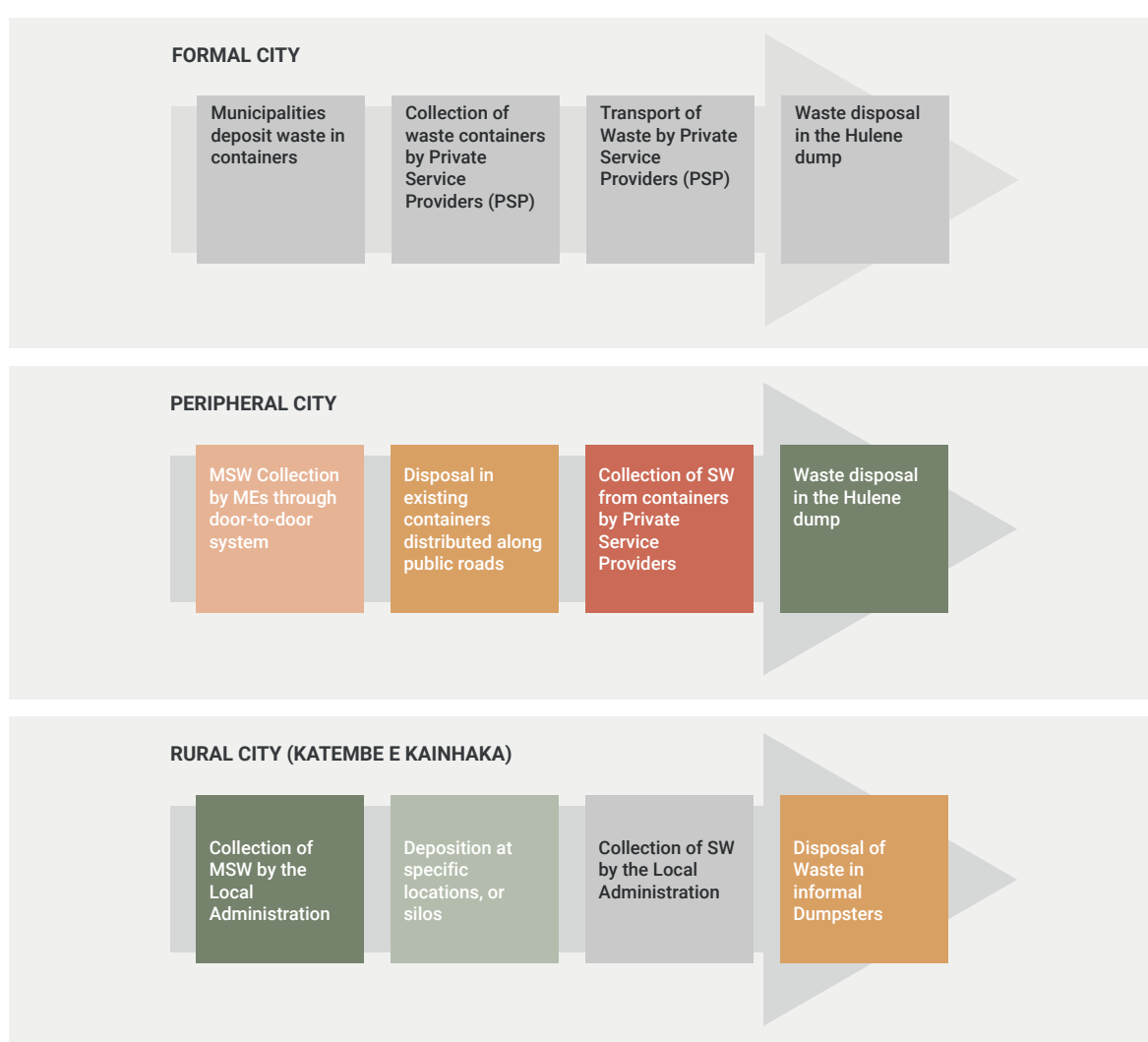


## Stress III: Inefficient management of urban metabolism

**Associated stressor:** Inefficient solid waste management

List of key documents (legal and strategic) and their relationship to each of the stresses, as well as actions that the Municipality has implemented or is carrying out, placing the city in a more resilient and sustainable position.

- In the administrative structure of the CMM, the collection of waste is the responsibility of the Environment and Health Department, within the Territorial Planning, Environment, and Urbanization Council (VOTAU). In the 2017-2027 Master Plan, three aspects are stated that are fundamental to address the problem of solid waste management:
  1. Lack of selective waste collection
  2. Lack of policy support for the three Rs (reduce, reuse and recycle)
  3. Lack of insight into the economic potential of waste



**Figure 27:** Summary of the three flows. Source: Collected in the Urban Solid Waste Master Plan<sup>16</sup> (2018).

- There have already been several initiatives by the Municipal Council regarding waste management:
  - Hiring micro-waste collection companies in the neighbourhoods, adapting to the urban reality (e.g. impossibility of entering certain neighbourhoods with a garbage truck)
  - Creation of MOPA (Participative monitoring Maputo) platform.
  - The CMM project in collaboration with Engenharia sem Fronteiras (ESF).

<sup>16</sup> Source: Presentation of CMM MSW Master Plan



## Stress III: Inefficient management of urban metabolism

**Associated stressor:** Inefficient ecosystem management and related infrastructure

List of key documents (legal and strategic) and their relationship to each of the stresses, as well as actions that the Municipality has implemented or is carrying out, placing the city in a more resilient and sustainable position.

- There are several strategies, policies, legislation, mainly at the national level:
  - MICOA's Environmental Strategy for Sustainable Development (now MITADER) was approved in 2007. It already identifies and establishes the main lines of action.
  - The importance of ecosystem conservation is addressed the Climate Change Adoption and Mitigation Strategy (approved in 2012) and other successive related documents such as the Disaster Management Act (2014) and its regulation (2016), among others.
  - Considering the cross-cutting nature of this stressor (it is, for example, closely linked to the previous ones), all existing legislation and documentation related to water, waste, air pollution, drainage, etc. addresses environmental issues and the need to maintain the balance of ecosystems and avoid their destruction.

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- CMM has already spent time working with many partners in different fields related to the care and maintenance of the various ecosystems within its territory:
  - **Land and related resources:** - support for urban gardens, which also provide a source of income for many families (mainly along the Infulene Valley)
  - **Water resources and supportive infrastructure:** - periodic cleaning of drainage ditches
  - **Ocean, coast and islands** - construction of elements that helped to minimize erosion on Marginal Avenue (sidewalks, etc.), establishment of a special protection zone for Ka-Inhaka, and support to CSO initiatives on beach clean-up
  - **Biodiversity, species, and protected areas** - establishment of special protection measures for the most rural urban districts (Ka-Inhaka and Katembe)
  - **Air and air pollution** - support projects to establish measures to improve the quality of air and decrease in respiratory diseases.
  - Promote awareness of environmental issues through various NGOs in neighbourhoods and schools.



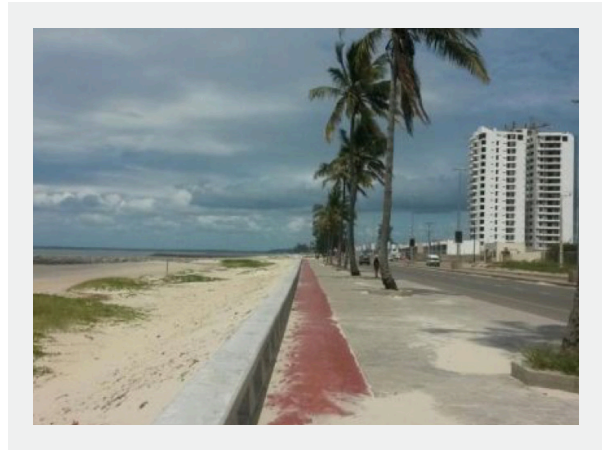
**Image 16:** Urban gardens in the Infulene Valley.  
Source: Google Images.



**Image 17:** Example of CMM's support for some CSOs' beach clean-up initiative. Source: Google Images.



**Image 18:** Av. Marginal before (left) and after (right) CMM intervention. Source: Google Images.



**Image 19:** Av. Marginal before (left) and after (right) CMM intervention. Source: Google Images.

## 2.3 Transversal lines of action in the Actions for Resilience

The work developed up to the previous section was oriented towards the analysis of the city's Current and Trend Scenarios. From now on, a completely different exercise begins; the construction of new proposals for actions that have an impact on improving the resilience and sustainability of Maputo's urban system as a whole.

As we have seen throughout the explanation of the different stresses, it is very difficult to separate informality from lack of infrastructure, the informal economy from spatial segregation and issues surrounding land tenure. It's all like a ball of wool: unrollable. There are certain subjects that are more easily distinguishable, such as mobility. This stressor can be said to have its "own identity" and possible ad hoc solutions. However, the decisions adopted should not forget the context in which they are inserted.

Socio-economic inequality manifests itself differently in each stressor. It is important not to lose focus on improving people's lives. Those most struggling socio-economically are at the same time those directly responsible for some of the deterioration situation of certain aspects of the ecosystems (e.g. clear-cutting of the few remaining trees), but are also often the most harmed by this dynamic.

It is important to underline that all the stressors have a scope that clearly goes beyond municipal limits, while also interacting with inhabitants at a micro level.

Thus, as a result of the connections discussed above, four critical lines of action are proposed:



**Figure 28:** Lines of Action. Source: CRPP (2019).

Any exercise in developing a proposal logically begins from detailed knowledge of the current situation (i.e. the starting point). However, a proposal does not emanate directly from the current situation, but is formed through an intentional decision-making process. To propose is to decide, to choose, to prioritise. In the final analysis, to propose may be to potentially take a risk, take a new direction and establish new responsibilities by law.





**Chapter 3**  
Resilient and Sustainable  
Scenario: Actions for Resilience

# Chapter 3

## Resilient and Sustainable Scenario: Actions for Resilience

### 3.1 Actions for Resilience: Definition of structure of actions: Areas of opportunity

As already mentioned in the contextualisation of stresses, there are certain contextual elements present in the city that should be considered conditions. Properly directed or oriented, conditions can serve to reinforce the resilience of the city. These conditions are:

	Legislation
	Human Resources - Coordination and internal communication
	Information Management
	Replication and dissemination of best practices
	Accountability of actors





## Legislation

Mozambique has very up-to-date legislation that is sensitive to certain areas that are current issues (such as resettlement, the environment, and gender). When addressing these issues in the various workshops that took place throughout the implementation of the CRPP, all participants agreed that the main problem is not a lack of legislation but a lack of effective implementation of existing legislation. There was also consensus in the various groups about several possible causes to this dynamic:

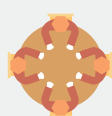
- Lack of knowledge/disclosure/ignorance (by employees)
- Lack of capacity for proper compliance
- Lack of interest (assuming greed)

There is a legal office at CMM whose main function is to ensure the legality of the institution's contracts, concessions, and other commitments and agreements. This department does not have a function of reviewing and updating the legislation or analysing it to find inconsistencies/incompatibilities with other national legislation. The specific legislation of each department/board is drafted with the participation of the technicians of each area and reviewed by lawyers, in order to avoid contradiction with other existing legislation.

One of the most representative examples of this lack of ongoing review can be found in urban planning legislation. In this area, chronologically, there are the following documents:

- 2003 - Municipal Posture on DUAT (Resolution No. 115 / AM / 2003)
- 2006 - Regulation of urban land (Decree 60/2006)
- 2007 - Spatial Planning Law - LOT (Law 19/2007)
- 2008 - LOT Regulation (Decree 23/2008)

There is a clear need to update municipal legislation to adhere to more recently adopted laws and regulations.



## Human Resources Coordination and internal communication

The situation of Human Resources (HR) in the Municipality of Maputo does not differ from that existing at the national level. Most of the workers are public officers, who fall under the Public Official Statute (which sets wages, titles, etc.). Salary levels often do not meet expectations of the workforce, which can lead to demotivation, career abandonment (for more attractive private sector positions, for instance), and perhaps most germane to this analysis, a lack of compliance with existing legislation. Furthermore, employees who participated in the different sessions or were interviewed as part of the CRPP implementation spoke of the lack of other non-salary motivations such as training. Lastly, due to the (physically) dispersed location of the various departments and directorates across the city, it is difficult to maintain coordination meetings between departments/dependencies that have common areas of responsibility.



## Information Management

During the data collection process of the CRPP implementation, there were a number of topics where no information was identified. One reason for this lack of information is inadequate data management systems.

There is no adequate data or information management in the Municipality, mainly because there is no perception of the importance of having reliable and updated data. Information is collected when it is needed for a particular subject (e.g. project formulation, high-level presentation, or international meetings).

Inadequate data information management is also a reflection of the lack of awareness about the “permanence of institutions” in comparison to the transience of the employees/people.

There is an archive in Maputo, with professionals from the area, but it is not an up-to-date depository of institutional information. Each department/office keeps its own documents (often without meeting the criteria of specific archiving or cataloguing legislation). Without this centralised or shared organisation of information and data, different departments also have difficulty obtaining information from other areas that could benefit and improve the institution's performance.



## Replication and dissemination of best practices

The Municipality of Maputo celebrated its 130th anniversary on 10 November 2017; that is, it is a municipality with history. Particularly in recent years, a number of actions have been implemented (some led by the CMM's, others driven by the institution's partners) to greater or lesser levels of success. The record of what happened in each of these actions - whether the objectives were achieved or not, the mistakes that were made, and the lessons learned - were neither collected nor systematised. Such knowledge remains only in the memory of the various employees who participated in each action. Therefore, there is a culture of starting from scratch each time a new project begins.

There are many occasions when successful initiatives have stopped (due to the end of a particular project and consequent lack of funding for the initiative) and the Municipality has not replicated or continued this work model, although it has proved to be a successful initiative.



## Accountability of actors

It is quite common to blame the public institution for the problems of a city. While surely much of the responsibility for problems with the city lies with the CMM, but it is equally true that other actors who live in the city have duties and responsibilities towards the municipality. These other actors are understood to be the residents or citizens (who live in it, pass through it, work in it, etc.) and the private sector that develop their profitable activity (which undoubtedly benefits both the CMM and the citizens).

The CMM is the institution responsible for managing the city, it should set the guidelines for its organisation, planning and management. It must provide services (water supply, garbage collection and others) and charge for them (considering the very different socio-economic realities of the inhabitants who live there).

Citizens must demand these services from the CMM, but they must do their part as well: obey the laws, pay their fees and taxes, behave civically (e.g. don't throw garbage out in the wrong locations, don't park on sidewalks, among others).

In turn, the private sector (economic engine and job generator in the city), has as its main objective its profit; but it is not exempt from compliance with the law, payment of taxes and fees, etc.

The co-responsibility of the three actors who live in the city is fundamental for a common understanding and appropriation of the city, each fulfilling the duties that correspond to it in order to demand the rights it has. The active participation of the three agents is required to improve the resilience of the City (**See Appendix 4. List of Actors**).

	CM – City Manager
	Citizens
	Private Sector

**Figure 29:** Participation and accountability of all actors. Source: Presentation by CRPP in Maputo City (2019).

## 3.2 Actions for Resilience: definition and structure of actions: types of implementation

It should not be forgotten that Maputo Municipality is not an isolated entity. It is an autonomous jurisdiction, but fits within the political-administrative organisation of the Republic of Mozambique and must comply with the national legislation in place. It should also be considered that the Municipality does not work alone; it collaborates and cooperates with many other national and foreign institutions and organisations, each with different processes, but which converge at certain times towards certain objectives.

It is therefore unrealistic to think that improving Maputo's resilience capacity is solely and exclusively in their own hands or is their own responsibility. Thus, three types of Actions for Resilience and Sustainability were established depending on the degree of participation/responsibility that the Municipality has or may have in their implementation:

### Direct Implementation

The Municipality can implement these actions directly, as they depend on its own decision and / or competence. This group constitutes all the measures proposed by the administration, already approved at local level.

**Example:** Placement of elements that prevent parking on sidewalks to promote their recovery for pedestrians, especially pedestrians belonging to the most vulnerable groups (people with reduced mobility, children, elderly, etc.).

### Agreement

The Municipality can induce actions through consultation with other relevant actors or agents, maintaining leadership capacity and / or lobbying proactively to ensure that this measure is implemented. For these actions, the capacity, power, and interest of other actors, such as those from the private sector or civil society organisations, is relevant.

**Example:** In introducing segregated collection of waste, it is necessary to identify the possible actors interested in the collection of various waste types.

### Advocacy

Actions requiring and advocacy approach are those that are not already legally approved or those made at a different level than the local level. These include issues that directly affect the Municipality, but for which the local government has no legal mechanism to perform the action. The local government can only exert pressure or advocate for implementation, as these actions depend on higher level institutions and require legal or competence changes.

**Example:** Definition of the metropolitan region at the administrative level, which would require/enable the identification of services and shared competences (e.g. transportation, waste, water, etc.), an effort which sits outside of the purview of the local government and requires high level institutional cooperation.

**Example:** Definition of the metropolitan region administrative level, identifying services and competences to share (transportation, waste, water, etc.), responsibilities, payments, management and others.

### 3.3 Prioritisation Actions for Resilience: critical lines of actions

Based on the stresses and shocks identified in the Current Scenario, four critical areas of action were defined to frame the proposed Recommendations of Actions for Resilience and Sustainability. The four different critical areas are: urban informality, urban transport and mobility, urban metabolism management, and management and recovery of major ecosystems.

Along with the critical areas, three integrating actions are identified: the revival of the Municipal archive, the review of the Urban Structure Plan (PEUMM) and the Creation of a Resilience Unit (UR). These three actions appear thanks to the analysis of opportunities in areas such as legislation, human resources, information management and institutional memory, the replication of best practices, and the involvement of actors.

As a result of the crossing of different perspectives or approaches (the four critical thematic lines of action, the five areas of opportunity/conditions and the three types of action/ implementation approaches), a series of Resilience and Sustainability Actions are proposed. The three integrative actions appear in all of proposed actions, serving as a binding element.

A table of actions has been prepared, organised by area of action. These tables should not be read independently of the document as they are based on all information contained herein.

Going forward, the CMM should continue identifying, proposing and implementing new Resilience and Sustainability Actions, perhaps led by a Resilience Unit.

## Actions by Critical Thematic Areas linked to Integrative Actions



### Urban informality

This critical line of action is closely linked to rapid urbanisation combined with little to no regulation, a dynamic detected as a stress in the diagnostic phase. Taking holistic actions addressing urban informality can improve the situation of informal settlements while simultaneously improving the status and coverage of basic infrastructure.

It should also be noted that intervention in urban Informality will reduce socioeconomic inequalities. To this end, inclusive policies must be successfully developed that contribute to the economic development of the inhabitants of informal areas, thereby improving their ability to access basic services.

#### Linked to Municipal Archive

##### Example action 1:

Continuity of the working methodology implemented in the Architects Without Borders project with the Municipal Council in Chamanculo C neighbourhood<sup>17</sup>- the work of this organisation is best practice that must be replicated. It primarily involves the Municipality and residents living in the areas under intervention. A future phase, wherein the private sector, that must provide services and basic infrastructure once the urban layout has been regularised, will allow for better access to this type of services. This proposed action is also one of direct implementation, as it assumes the continuity or replication of a working methodology that has already been (and is being) successfully implemented, efforts that should also be recorded in the archive (if it is to be replicated in the future). It is also an action that involves the commitment of the three city actors, (City Council, private sector and citizens) which helps to ensure the sustainability of the intervention.

#### Linked to the Urban Structure Plan Review (PEUMM)

##### Example action 2:

Review and update of the Municipal DUAT / identification of inconsistencies and legal voids – this action was identified within the framework of the NGO Architects without Borders project; when the Municipality's own technicians (who are familiar with the problems and consequences these inconsistencies and legal voids) conveyed that this action should be seen as a priority as it would have a major impact on this issue. This is a direct implementation action, which should take advantage of existing legislation to update it as well as the knowledge and experience of the Municipality's staff in this area.

#### Linked to the creation of a Resilience Unit (UR)

##### Example action 3:

Involvement of new actors – the UR as a coordinating element to support involvement of other institutions in this working methodology (NGOs, academia and others). Considering the currently available GIS database being developed under the SEC-GD<sup>18</sup> Project - Urban Action Plan George Dimitrov's Strategic Improvement Plan – UR could promote updating the database and making it available to other Municipal departments. It is a direct implementation action that would require the coordination of human resources from different Municipal departments and other independent institutions.

<sup>17</sup> Architecture without Borders (AWB). (2018-2019). HABITAT PROJECT - "Defending the right to access to the city through participatory urban reorganization and access to the DUAT title in the informal neighborhoods of Maputo". Partners: Maputo City Council and the Mozambican Bar Association (Institute for Access to Justice). Funders: Council of Barcelona, Fundación SELAVIP, Council of Pamplona, Generalitat Valenciana and Italian Cooperation.

<sup>18</sup> SEC-GD Project: Department of Urbanization and Territorial Ordinance of UPC • BcnTech. Local partners: CMM and UEM Faculty of Architecture and Physical Planning. Contact: maputo.etsab@upc.edu; arwen.p.gumbao@upc.edu / Funded by the Barcelona City Council and UPC Cooperation Center • BcnTech.

## Actions by Critical Thematic Areas linked to Areas of Opportunity

Urban informality		
Legislation	Actions for Direct Implementation	Action 1. Review and update of DUAT municipal status
	Agreement actions	Action 1. Identification of inconsistencies and legal gaps in DUATs processes
Human resources	Actions for Direct Implementation	Action 1. Train CMM technicians in the methodology being applied by ASF in their project HABITAT in Camanculo C. neighbourhood. <sup>19</sup>
Information management	Actions for Direct Implementation	Action 1. Strengthen and improve use of the municipal archive, recording the history of interventions made in this area for future consultation.
		Action 2. Populate and maintain the GIS database began through the SEC-GD Project for the George Dimitrov neighbourhood <sup>20</sup> .
Replication and dissemination of best practices	Actions for Direct Implementation	Action 1. Continue the CMM-ASF (project HABITAT) joint initiative by extending it to more neighbourhoods. The Resilience Unit could assist in coordinating stakeholders.
		Action 2. Continue with the realisation of the GIS databases, incorporating new neighbourhoods. The Resilience Unit could ensure its resilience and availability to interested departments (link Archive - UR - CMM Departments).
Actor's accountability	CMM	Action 1. Make DUATs more flexible in areas that have been rearranged
	Citizens	Action 2. Assignment of domestic (private) space to transform it into public (street)
	Private sector	Action 3. Promote the installation of street lighting or paving in rearranged areas.

<sup>19</sup> Architecture without Borders (ASF). (2018-2019). HABITAT PROJECT - "Defending the right to access to the city through participatory urban reorganization and access to the DUAT title in the informal neighborhoods of Maputo". Partners: Maputo City Council and the Mozambican Bar Association (Institute for Access to Justice). Funding: Council of Barcelona, Fundación SELAVIP, Council of Pamplona, Generalitat Valenciana and Italian Cooperation.

<sup>20</sup> SEC-GD Project: Department of Urbanization and Territorial Ordinance of UPC • BcnTech. Local partners: CMM and UEM Faculty of Architecture and Physical Planning. Contact: maputo.etsab@upc.edu; arwen.p.gumbao@upc.edu / Funded by the Barcelona City Council and UPC Cooperation Center • BcnTech.

## Action Example

### Replication of the working methodology for the reorganisation of informal neighbourhoods (projeto HABITAT<sup>20</sup>):

<p>A4R - Direct Implementation / concentration / pressure</p>	<b>Legislation - lack of trustworthy database</b>	<ul style="list-style-type: none"> <li>● Revise legislation</li> <li>● Identify flaws, gaps and incoherence</li> <li>● Update to new realities</li> </ul>
	<b>HR: Coordination and collaboration</b>	Development of plans and sharing them
	<b>Replication and dissemination of best practices</b>	Project CMM-ASF
	<b>Actor's Accountability</b>	<ul style="list-style-type: none"> <li>● CMM - emission of DUATs</li> <li>● MUNICIPALITIES - cessation of domestic space (private) to make it public (street)</li> <li>● Private Sector</li> </ul>
	<b>Where to implement these A4R?</b>	Prioritize the neighbourhoods

Figure 30: Example of an action addressing Urban Informality. Source: Projecto HABITAT, ASF-CMM (2018-2019).

As this is a direct implementation action within the Urban Informality line of action, it is proposed to give priority to replicating best practices of the Architecture Without Borders (ASF) project with the CMM and expanding this work methodology to other neighbourhoods. The project is currently being implemented in five blocks of Chamanulo C, with the potential of being expanded to another five blocks in the near future.

Considering the positive impacts this action is already having, the CMM could invite other stakeholders interested in supporting in the area of urban planning to learn from this methodology that is proving so effective.

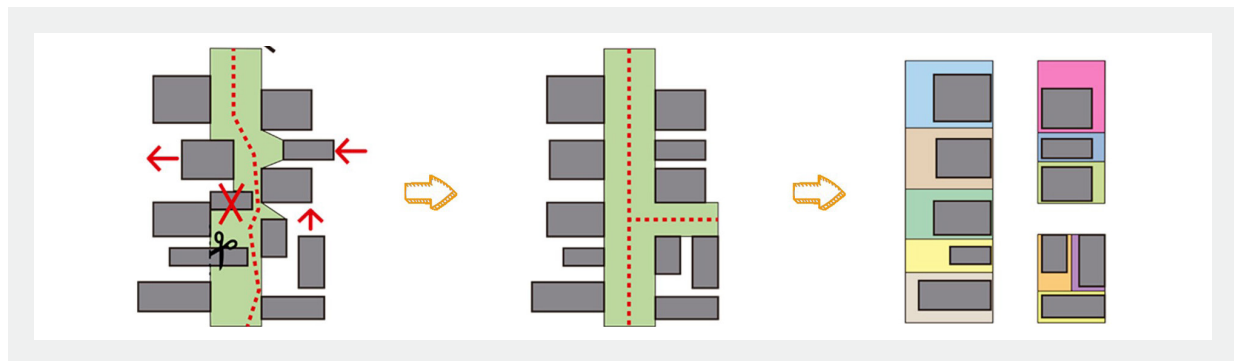


Figure 31 / 32: Process promoted under the ASF-CMM initiative. Source: Projecto HABITAT, ASF-CMM (2018-2019).

<sup>19</sup> Ibid



## Actions by Critical Thematic Areas linked to Integrative Actions



### Transport and Urban mobility

The state of urban mobility in Maputo is a problem and consequence of the characteristics of the city (e.g. the existence of informal settlements with inadequate streets, the scope and scale of the informal economy, etc.). To get a full picture of the problem, one has to look beyond the municipal territory and recognise the interdependence / relationship that Maputo has with Matola City and Marracuene District. The Municipality of Maputo has undertaken various initiatives, such as the definition of Gran Maputo, which includes the municipalities of Maputo, Matola and Boane and a part of Marracuene District and the establishment of the Metropolitan Transport Agency, which operates under the responsibility of Ministry of Transport and Communications.

All actions undertaken so far to improve mobility within Greater Maputo (from city centre to small neighbourhoods and vice-versa) have emerged from the Municipality's coordinated work with other actors (cooperation partners, NGOs, ministries and other administrations). Despite the path taken, it is necessary to continue working in this area to reduce mobility challenges, while at the same time promoting the environment and generating better possibilities for the socio-economic development of the region's inhabitants.

#### Linked to Municipal Archive

##### Example action 1:

Support in consolidating the legal identity of METROPOLITAN AREA / REGION (as a supra-municipal entity) and for the sharing of other areas of responsibility (garbage collection, provision of drinking water, etc.). This action will bear fruit in the medium to long term. This is an action of agreement involving the collaboration and coordination of various partners of the Municipality (who have already received initial support from the Barcelona Metropolitan Agency and UN-Habitat); but it is also an advocacy action. The Municipality of Maputo, together with the other administrations that make up Greater Maputo should advocate for an "official" definition of this administrative step, which is included in the legal framework, as it will pave the way for other cities in the country facing similar situations in service sharing (Beira-Dondo, for example).

#### Linked to the Urban Structure Plan Review (PEUMM)

##### Example action 2:

Legislating the parking situation on city sidewalks - this aspect of mobility is often forgotten, but every citizen should be protected. The proposed action aims, under the leadership of the Municipal Council, to ensure the safety and traffic of pedestrians on the sidewalks, especially considering the problems currently facing the most vulnerable people (people with reduced mobility, children and the elderly). Legislation addressing parking on the sidewalks already exists but is not enforced. This is a direct implementation action that involves the three city actors (City Council, private sector and citizens), wherein each actor has their share of responsibility. However, there also exists an opportunity to work with other partners (NGOs, Ministry of Education and Human Development, etc.) to educate and raise awareness of new generations and thus ensure the action's sustainability (by changing attitudes).

#### Linked to the creation of a Resilience Unit (UR)

##### Example action 3:

The Resilience Unit shall be a coordinating entity that shall ensure that mobility issues are addressed from a people-centre approach. These themes should be focused on and worked on collaboratively with other matters, as the urban fabric (e.g. how best the urban fabric can be modified to minimise mobility problems); gender (do safe transport systems exist for women and girls?); effects on CO<sub>2</sub> and other gas emissions and consequently the public health impacts on Maputo residents as a result of mobility.

## Actions by Critical Thematic Areas linked to Areas of Opportunity

Urban informality		
<b>Legislation</b>	Actions for Direct Implementation	Action 1. Create new/enforce existing legislation concerning parking on city sidewalks.
	Advocacy Actions	Action 1. Support the consolidation of the legal identity of the ÁREA/ REGIÃO METROPOLITANA (supra-municipal entity), to support improved sharing of the provision/management of certain services (e.g. transport, garbage collection, water provision, etc.). This model may be then be replicated in other parts of the country (e.g. Beira-Dondo).
<b>Human resources</b>	Actions for Direct Implementation	Action 1. Strict monitoring and management of parking-related issues.
<b>Information management</b>	Actions for Direct Implementation	Action 1. Improve communication and coordination between departments about work to be done. The Resilience Unit could coordinate the efforts for greater efficiency and integration of cross-cutting issues relating to mobility affecting citizens (e.g. gender or health).
<b>Replication and dissemination of best practices</b>	Concertation Actions	Action 1. Disseminate the Rambla Samora Machel project for its effective implementation (documentation to be kept in the Municipal Archive for consultation with potential stakeholders).
<b>Actor's accountability</b>	CMM	Action 1. Promote the placement of elements that prevent illegal parking. Action 2. Encourage private sector fiscal measures.
	Citizens	Action 1. Citizens should remain vigilant and not forget their pedestrian status and respect the sidewalks. Action 2. Use green elements (e.g. with worn tires).
	Private sector	Action 3. Placing elements that deter car parking and take care of the maintenance of those elements.

## Action Example Recovering Pedestrian Access for the Citizen:

<p>A4R - Direct Implementation / concentration / pressure</p>	<p><b>Legislation - lack of trustworthy database</b></p> <ul style="list-style-type: none"> <li>• Implementation of approved strategies</li> <li>• Legal definition of metropolitan area</li> </ul>
	<p><b>HR: Coordination and collaboration</b></p> <p>Strict compliance with parking prohibition areas</p>
	<p><b>Replication and dissemination of best practices</b></p>
	<p><b>Actor's Accountability</b></p> <ul style="list-style-type: none"> <li>• CMM - definition of locals / involvement of the actors</li> <li>• Municipalities</li> <li>• Private Sector - Funding</li> </ul>
	<p><b>Where to implement these A4R?</b></p> <p>Recovery of citizen walks in the identified cement city areas</p>

Figure 33: Example of an action addressing Urban Transport and Mobility. Source: CRPT (2019).

It is proposed to give priority to the recovery of sidewalks for citizens (direct implementation action) through the placement of elements that prevent parking and ensuring the mobility of people with special needs. Negotiations with various private sector actors should aim for the development and maintenance of these elements.

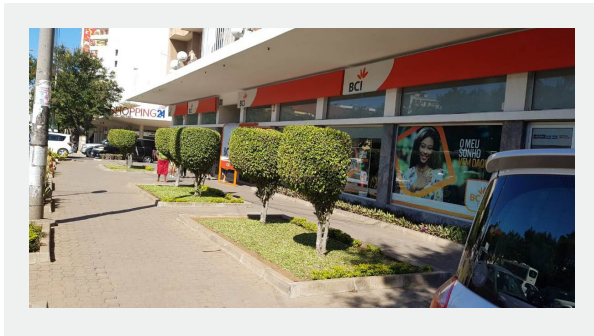


Image 20: Vegetation elements that not only prevent car parking, but also provide aesthetic and environmental improvements. Source: CRPP (2019).

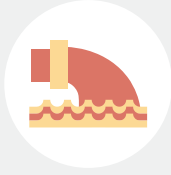


Image 21: Vegetal elements built out of recycled material, initiative of the neighbours. Source: CRPP (2019).



Image 22: Physical elements, allowing the “coexistence” between pedestrians and cars. Source: CRPP (2019).

## Actions by Critical Thematic Areas linked to Integrative Actions



### Management of Urban metabolism

This critical line of action aims primarily to improve water cycle management, including the treatment of solid waste. Although the competencies of the provision and management of water and solid waste management belong to different scales (national and local), action design can be approached from a joint perspective to harness synergies, try to generate opportunities, and at the same time to foster socioeconomic development.

#### Linked to Municipal Archive

##### Example action 1:

Support in consolidating the legal identity of METROPOLITAN AREA / REGION (supra-municipal entity) and for the sharing of other areas of responsibility (garbage collection, provision of drinking water, etc.). This action will bear fruit in the medium to long term. The current Metropolitan Transportation Agency focuses only on mobility issues and needs expand its scope to include other services essential to the urban metabolism such as water cycle management.

#### Linked to the Urban Structure Plan Review (PEUMM)

##### Example action 2:

Require the placement of elements to ensure rainwater collection and use in new buildings to be approved by the Municipality - This proposed action is for the Municipality to ensure effective compliance with the Ministerial Order of 7 October 2005 for the Minister of Public Works and Housing: obligation to provide rainwater catchment systems in public buildings of new construction. This requirement can be extended to new private buildings to minimise the use of drinking water for irrigation and other similar uses as well as the consequences of large amounts of water running down the streets (gutter clogging, etc.). This is a direct implementation action that involves the establishment of specific legislation (of municipal competence) as well as its compliance (HR of the Municipality).

#### Linked to the creation of a Resilience Unit (UR)

##### Example action 3:


Begin separate collection of organic / non-organic waste for composting (mainly in markets) - The Municipality has already established a Strategic Plan for this sector, which presents a comprehensive overview waste collection challenges. The proposed action falls under the purview of this guiding document, being clearly of direct implementation, while greatly benefiting from the involvement of citizens and the private sector. Organic waste collected in the markets may be turned into revenue to the Municipality (by selling the product as processed manure) as well as a reinforcement for "machambas" activities (which serves as the economic livelihood for many families). UR could act as the responsible party within the Municipality and oversee coordination and planning between departments.

## Actions by Critical Thematic Areas linked to Areas of Opportunity

Urban informality		
Legislation	Actions for Direct Implementation	Action 1. Require the placement of elements to ensure rainwater collection and use in new buildings to be approved by CMM.
	Advocacy Actions	Action 1. Support the consolidation of the legal identity of the REA/ REGIÃO METROPOLITANA (supra-municipal entity), to support the provision of/management of certain services (e.g. transport, garbage collection and water provision). Currently the Metropolitan Transportation Agency deals only with transportation. This action foresees the expansion of responsibility to other urban services. The definition of this new administrative level may be useful in other parts of the country such as Beira-Dondo.
Human resources	Actions for Direct Implementation	Action 1. Promote effective recycling in all CMM departments  Action 2. Plan routine actions (such as pruning) in a coordinated manner to optimise resources and capitalise on synergies. The Resilience Unit could coordinate the action for different departments involved to ensure greater effectiveness.
	Agreement Actions	Action 1. Request training and exchange of experience with specialised institutions in these areas.
Information management	Actions for Direct Implementation	Action 1. Creation of a database that tracks private entities who are major polluters (or those in need of special waste treatment) and cross-checking with other sectors.
	Agreement Actions	Action 1. Creation of a data platform shared between national and local authorities to allow for greater coordination of actions. Involvement of academia may also be prudent. The Resilience Unit, in coordination with the archive, could oversee the updating of information as well as monitor and complete the databases delivered under the CRPP.
Replication and dissemination of best practices	Actions for Direct Implementation	Action 1. Continue with MOPA (Participative Monitoring Maputo) Platform
	Agreement Actions	Action 1. Coordinate with AMOR (Mozambican Recycling Association) to establish more segregated waste collection points
	Advocacy Actions	Action 1. Work with MINEDH (Ministry of Education and Human Development) to introduce these issues into the school curriculum.
Actor's accountability	CMM	Action 1. Begin with segregated organic/non-organic waste collection for composting
	Citizens	Action 2. Dispose of waste at the specified points, respecting especially what should be deposited in each container.  Action 3. Do not deposit trash in drainage ditches.
	Private sector	Action 4. Purchase/sale of fertiliser for parks, gardens, private homes, etc.

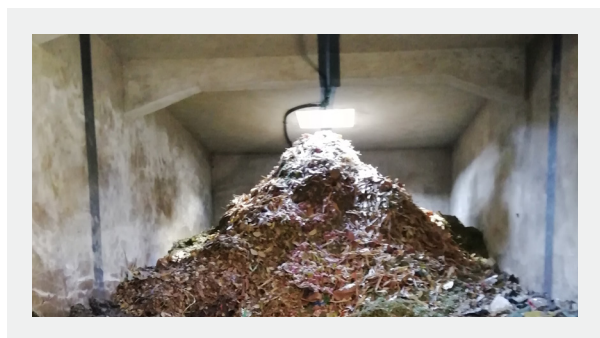
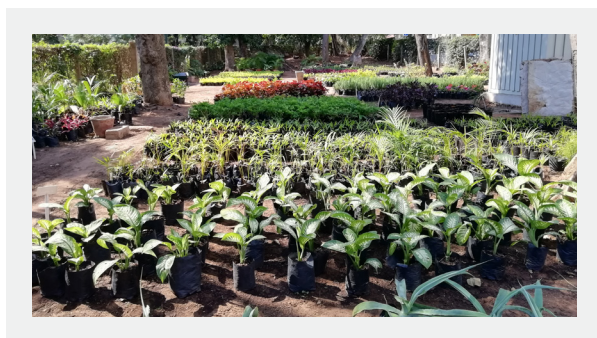


## Action Example Compost pilot project:

	<b>Legislation - lack of trustworthy database</b>	Updating new realities: metropolitan areas (new dumpster).
	<b>HR: Coordination and collaboration</b>	Organize workshops in line with the new structure) to prepare joint planning and harmonize interconnected lines of action (within the same and between different versions).
	<b>Replication and dissemination of best practices</b>	MOPA Platform
	<b>Actor's Accountability</b>	<ul style="list-style-type: none"> <li>● CMM - collection in time, availability of compost site</li> <li>● Municipals / Sellers - careful segregation</li> <li>● Private Sector - compost buying / selling</li> </ul>
	<b>Where to implement these A4R?</b>	Pilot project for composting through selective collection of the People / Janete market (close to Jardim Tunduru).

**Figure 34:** Example of an action addressing Urban Metabolism Management. Source: CRPT (2019).

This direct implementation action in the urban metabolism management (waste component) area of action proposes to give priority to the segregation on the collection of organic waste (mainly in markets) for the preparation of fertiliser. Currently the CMM has a small area for the preparation of fertiliser in the Tunduru garden. However, production is limited and only provides for the nursery that is located there. A higher production of compost could be used in the gardens of the Infuelene Valley, which in turn could generate positive economic impacts for families dedicated to agricultural-urban activity. Furthermore, CMM could earn revenue from the sale of fertiliser to private entities (e.g. for use in parks, private homes, etc).



**Image 23 / 24 / 25 / 26 :** CMM facilities in Jardim Tunduru: the compost depot and the nurseries attached to it.

Source: CRPP (2019).

## Actions by Critical Thematic Areas linked to Integrative Actions



### Management and Recovery of Critical Ecosystems

This line of action stands out for its transversality. All existing legislation and documentation related to the previously discussed lines of action also address environmental issues and the need to maintain ecosystem balance.

In Mozambique, there are various national strategies, policies and laws, such as the Climate Change Mitigation and Adaptation Strategy and its successive, derivative initiatives.

In addition, Maputo's Municipality has already spent time working with various partners in different fields related to the care and maintenance of the various ecosystems existing in its territory. Further work in this area is needed to improve the state and management of ecosystems through the coordination of initiatives and political and citizen awareness.

#### Linked to Municipal Archive

##### Example action 1:

Working with the Ministry of Education and Human Development (MINEDH) to include ecosystem care issues in the school curriculum. The history of ecosystem degradation in the city cannot be changed. However, there is still in time to slow down the environmental deterioration and to recover some of the destroyed ecosystems. The proposed action envisions the institution responsible for education (MINEDH) to include key environmental issues in the school curriculum including activities outside the classroom. These key issues could include, but not be limited to, the explanation of existing fauna and flora and the consequences of their disappearance. The Municipal Archive could make existing environmental information available from the past decades up until the current situation. The creation of public exhibitions and the involvement of academia can help raise and reinforce awareness.

#### Linked to the Urban Structure Plan Review (PEUMM)

##### Example action 2:

Ensure the protection of environmentally sensitive areas (Katembe and Ka-Inhaka) through their identification in the revision of the PEUMM and establishing specific legislation to protect targeted areas. This direct implementation action assumes the legislation (LOT - review of the PEUMM after 10 years) and aims to learn from what has occurred and, where possible, seek to mitigate ecosystem deterioration.

#### Linked to the creation of a Resilience Unit (UR)

##### Example action 3:

Support the initiatives of civil society organisations to clean up beaches and other sensitive areas through the allocation of staff and equipment. It is an agreement action, in which the Municipality must leverage the capacities of CSOs using the supportive resources available to the Municipality. These types of action may complement the action linked to the Municipal Archive by joining education-oriented efforts with a more global and sustainable approach. The UR would have a role coordination between the institutions involved (the departments of the Municipality, CSOs and others).

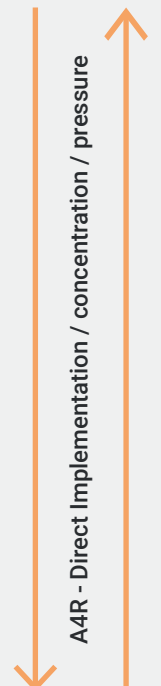
## Actions by Critical Thematic Areas linked to Areas of Opportunity

Urban informality		
<b>Legislation</b>	Actions for Direct Implementation	Action 1. Review and update of municipal environmental legislation. <hr/> Action 2. Ensure the protection of environmentally sensitive areas (Katembe and Ka-Inhaka) by identifying them in the preparation of the PEUMM and establishing specific legislation.
	<b>Human Resources</b>	Action 1. Work in coordination with INGC; with the Resilience Unit serving as the link between this institution and the CMM
<b>Information Management</b>	Agreement Actions	Action 1. Work with the farmer's associations for the care and maintenance of the area's ecosystems.
	Actions for Direct Implementation	Action 1. Promote information in neighbourhoods regarding the importance of not cutting down trees, mangroves, etc. <hr/> Action 2. Continue to develop GIS databases incorporating new neighbourhoods with information on environmental issues. The Resilience Unit could ensure its resilience and availability to interested departments (link Arquive - UR - CMM Departments).
	Agreement Actions	Action 1. Promote green tourism together with the Ministry of Tourism.
	Advocacy Actions	Action 1. Work with MINEDH (Ministry of Education and Human Development) to include Ecosystem care issues in the school curriculum.
<b>Replication and dissemination of best practices</b>	Actions for Direct Implementation	Action 1. Support CSOs working on beach and other clean-up initiatives through the provision of staff and equipment.
<b>Actor's accountability</b>	CMM	Action 1. Promote the protection of ecosystems. The Resilience Unit would play a key role in coordinating actors.
	Citizens	Action 2. Comply with protected areas.
	Private sector	Action 3. Conduct environmental impact studies and follow recommendations. <hr/> Action 4. Promote green and responsible tourism.



## Action example

### Strengthening existing initiatives led by CSOs:

 A4R - Direct Implementation / concentration / pressure	<b>Legislation - lack of trustworthy database</b>	Strict application of legislation (calamities)
	<b>HR: Coordination and collaboration</b>	With INGC
	<b>Replication and dissemination of best practices</b>	Cleaning of beaches and other public places with participation (and / or CSO initiative)
	<b>Actor's Accountability</b>	<ul style="list-style-type: none"> <li>● CMM -</li> <li>● MUNICIPALITIES -</li> <li>● PRIVATE SECTOR -</li> </ul>
	<b>Where to implement these A4R?</b>	Mangrove area protection

**Figure 35:** Example for an action addressing the Management and Recovery of Major Ecosystems. Source: CRPT (2019).

This direct implementation action within the Ecosystem Management line of action propose to give priority to the support offered to CSOs on beach clean-up days, seeking to achieve a wider coverage (e.g. Ka-Tembe beaches). The cleaning of drainage ditches in many urban areas of the city is another initiative to be supported and reinforced, although it seems to have less visibility.

Raising awareness in schools about the importance and care of ecosystems is an investment for the future.

### 3.4 Actions for Resilience: Integrative Actions: comprehensive, integral, and direct

Considering the different perspectives and the intersection of the various lines of thought in the Recommendations of Actions for Resilience and Sustainability, it was possible to identify three actions that are clearly of direct implementation, under the sole and exclusive responsibility of the Municipal Council. These actions have a great impact on improving the Maputo's resilience and can serve as an umbrella for all the resilience actions that have been proposed in the previous tables (and in which they have already been mentioned). These are actions that, at the same time, can be considered areas of opportunity, due to the comprehensive nature they have:

1. Revitalisation of the Municipal Archive
2. Review of the Urban Structure Plan (PEUMM)
3. Creation of a Resilience Unit (UR)



#### Revitalisation of the Municipal Archive

This body currently has an underutilised status within the overall structure of the Municipality. This is despite the fact that over the last few years, with the support of the Ajuntament de Barcelona, its structure and organisation has greatly improved. As a part of this effort, its facilities were improved, technicians were trained, and the importance of their work better recognised through the recognition by CEDIMO.

Legislatively, the municipal archive is not aware of the various legal documents for the different departments and dependencies nor about the subsequent updates. There is a legal office in the Municipality, but it deals primarily with issues related to the legality of contracts, Public Private Partnerships, etc. Each department is responsible for monitoring their legislation, adhering to updates, new laws, etc.

The municipal archive could play a more relevant role, serving as the “heart” of the institution and repository of legislative information. This may include making updates available, promoting inter-departmental capacity building and other similar actions. It would not play a role in implementing legislation, but rather act as a disseminating entity.

#### A4R - The Information Flow

Consider the Municipal Archive as the **heart** of Legislation and information

Dissemination to departments and / or departments of the new legislation

Reception to departments and / or departments of the new legislation

With the dominance and control of the legislation, the Municipality is in a better position to negotiate

Figure 36: A4R. Revitalization of the Municipal Archive. Source: CRPP (2019).



## Review of the Urban Structure Plan (PEUMM)

The PEUMM was approved in 2008, with a validity period of 10 years, as established by the Territorial Planning Law Regulation (article 64, line 3), which is the estimated time for the plan to be reviewed and updated. This action will undoubtedly require all efforts of the Municipality, as the Current Scenario is quite different from the one in 2008. Many approved laws need to be updated or revised. There are also several deviations from the previously approved PEUMM and there are new challenges that Maputo City must now face due to its more metropolitan and regional character. There is also more awareness today about the problems related to climate change and the dire consequences a non-resilient city could suffer.

This action should be considered a great opportunity to review the city's path taken over these ten years, learn from previous mistakes, identify enduring and emerging gaps, and consider the future of the city.



**Figure 37:** A4R. Revision of the Urban Structure Plan (PEUMM). Source: CRPP (2019).



## Creation of a Resilience Unit (UR)

The Municipality of Maputo, as the capital of Mozambique, has a complex structure and areas of responsibility relating to management of the city trying to respond to different emerging problems. Resilience must be understood as an intrinsic feature of the institution; not as something imposed or compulsory, but as something necessary for a better internal functioning.

Thus, it is suggested that a Resilience Unit (UR) is created, whose function would be to introduce this vision of a resilient Maputo and to raise awareness about issue of critical importance that would notably improve the city's capacity in the face of unforeseen events (climate and not only). (See Annex VII. Terms of Reference for the establishment of a Resilience Unit in Maputo Municipality).

This Unit could have several tasks according to identified areas of opportunity/conditions.

### Legislation

- Maintain knowledge and legislative references with the support of the Municipal Archive.
- Ensure active participation of the Municipal Archive.

### Human Resources

- Train other CMM departments on resilience.
- Support coordination between CMM departments.
- Coordination with other relevant agents: other state institutions, civil society organisations, academia, international organizations, etc.
- Promote CMM's work and joint participation with citizens and the private sector.

### Information management

- Maintenance of urban resilience data (necessary for diagnosis).
- Maintenance of the inventory of plans and initiatives not implemented but with great resilience/sustainability potential.
- Maintenance and diffusion of knowledge on urban resilience.
- Preparation of informative materials for schools and neighbourhoods.

Considering that most critical departments are located within same City Hall building, the UR should be located there as well. A gradual introduction of the Unit is proposed, with the appointment of technicians who are already CMM staff, to avoid extra costs and try to ensure sustainability.

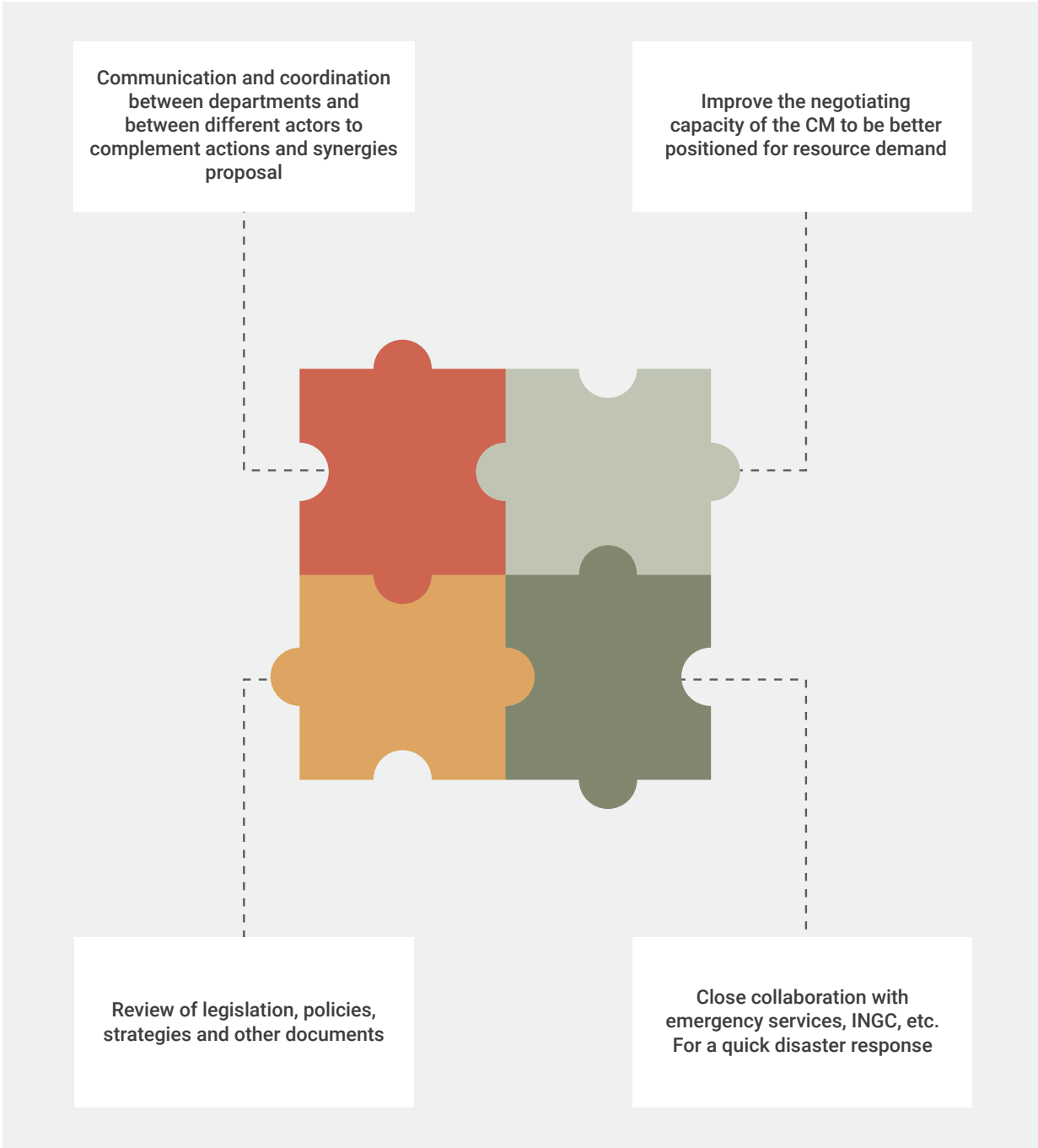


Figure 38: A4R. Creation of a Resilience Unit (UR). Source: CRPP (2019).

## 3.5 Conclusions

As has been mentioned throughout the previous pages, the resilience of a city is an intrinsic feature that aims to improve a city's ability to adapt and recover from external (shock) and internal (stress) events derived from the very nature of the city.

The CRPP was a pilot experience that should serve Maputo City to guide its path in decision making and prioritisation of actions. It was neither a competition nor a comparison with other cities benefiting from the program, but rather a self-assessment of how the city is performing in relation to internationally established levels (NAU, ODS).

It was not in the nature of this project to propose major financial actions or unsustainable interventions, but a joint analysis and reflection exercise, identifying many existing positive aspects and changing the way the city looks at itself.

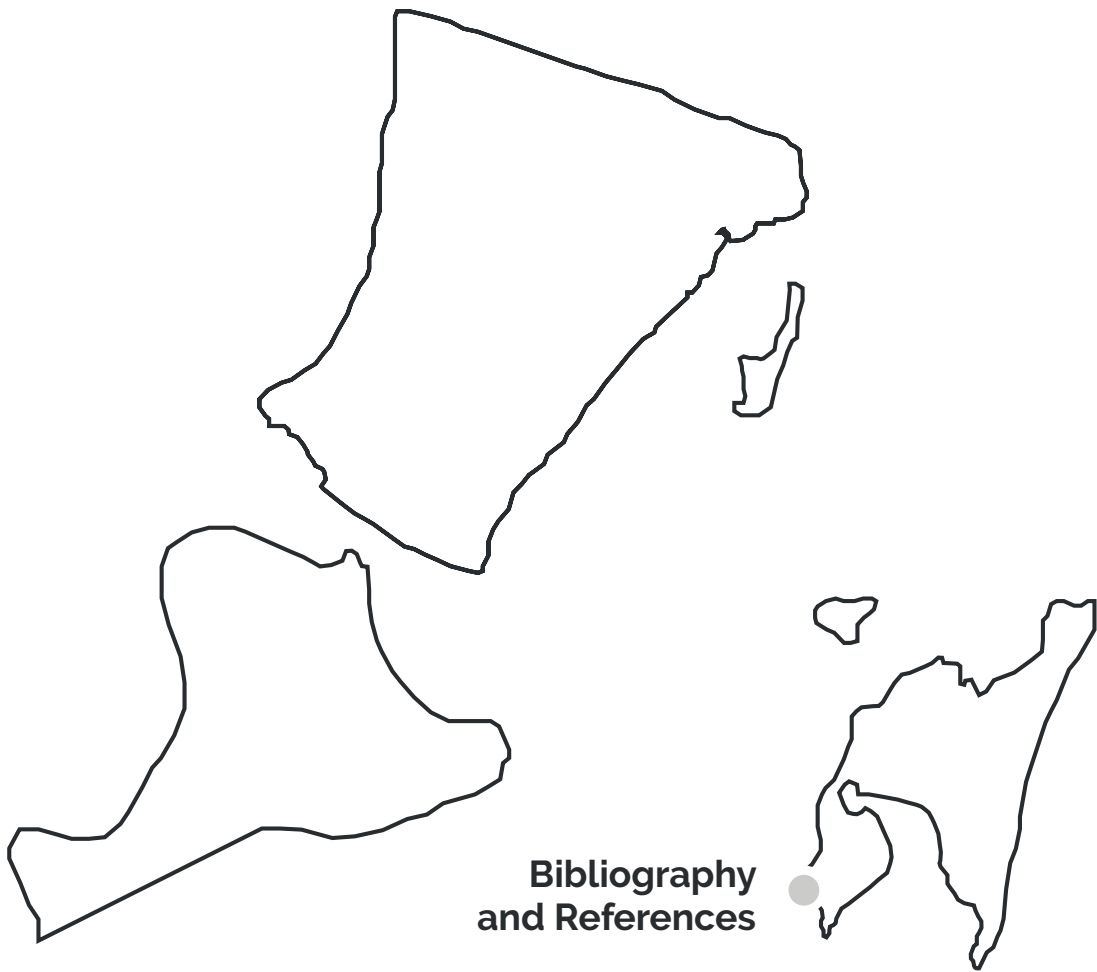
The greater or lesser resilience of a city is a feeling that must come from within the Municipality itself. Not only of the institution as such, but also of the residents and the private sector that live in the city. Unfortunately there are many examples in the recent years that show us the consequences of events of different nature, which change the daily operation of cities. Maputo is not free from these threats, and in order to become more resilient and sustainable, the Municipality, in collaboration with CRPP, has begun down this path.

Mozambique has very advanced legislation and policies that are adapted to the latest issues (such as the climate change strategy). Maputo has a very large and experienced technical team that is well-equipped to both drive and promote Actions for Resilience and Sustainability lead efforts to apply current regulations, as no one knows the city better than them.

But the CMM is not alone. It must share responsibility with two other key actors who live in the city (the residents and the private sector). Only with collaboration among all can the path towards resilience and sustainability of Maputo City be taken.

The Recommendations of Actions for Resilience and Sustainability proposed under this report are a first exercise with the Municipality. Maputo City is has the opportunity to alter its urban model from a resilient perspective, relying on the other co-responsible actors in the city to ensure sustainability.







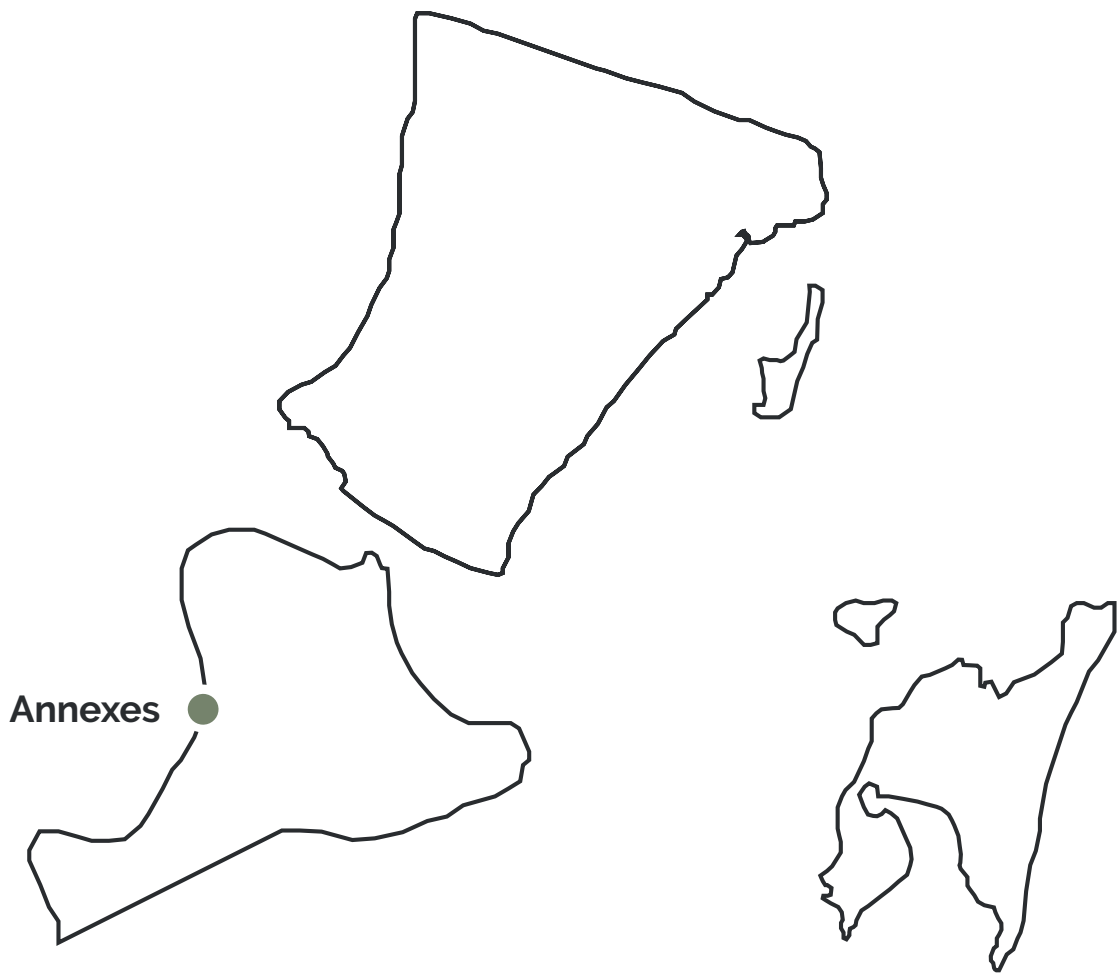
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# CRPP Implementation Process in Maputo





## List of figures

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**Figure 1**      Timeline of CRPP Implementation in Maputo.

## List of images

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**Image 1**      Image 1. April 2018. UN- Habitat / CRPP and Directorate of Global Justice and International Cooperation of the City of Barcelona visit to Chamanculo neighbourhood. Source: CRPP (2018).

**Image 2**      Image 2. November 2018. Resilience Diagnosis Workshop in Maputo. Source: CRPP (2018).

**Image 3**      Image 3. March 2019. Visit to a market project (implemented by the Red Cross).  
Source: CRPP (2019).

**Image 4**      Image 4. March 2019. Official presentation of the Actions for the Resilience for the Municipality of Maputo. Source: CRPP (2019).

## List of acronyms and abbreviations

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<b>A4R</b>	Actions for Resilience
<b>AECID</b>	Spanish Agency for International Cooperation for Development
<b>AdeM</b>	Water for the Region of Maputo
<b>CRPP</b>	City Resilience Profiling Programme
<b>CRPT</b>	City Resilience Profiling Tool
<b>EC</b>	European Commission
<b>GIZ</b>	Gesellschaft für Internationale Zusammenarbeit
<b>ICLEI</b>	Local Governments for Sustainability
<b>MOU</b>	Memorandum of Understanding
<b>RAR -S</b>	Recommendations for Actions for Resilience and Sustainability
<b>UN-Habitat</b>	United Nations Human Settlements Programme
<b>UNDP</b>	United Nations Development Programme

# Annex I

## CRPP Implementation Process in Maputo

Engagement in Maputo to implement the City Resilience Profiling Programme (CRPP) and its resilience-building methodology as a pilot city began in the last quarter of 2016 and was solidified in mid-2017 through a Memorandum of Understanding (MoU) prepared in joint collaboration by UN-Habitat and the Municipality of Maputo. During this period, UN-Habitat selected a City Focal Point who, after undergoing training on urban resilience and CRPT, particularly in data collection and analysis, would directly implement CRPT in coordination with the Municipality. The Municipality assigned two (2) municipal Focal Points to directly support the efforts of CRPP. UN-Habitat / CRPP performed four (4) field visits to further engagement and training with key city partners.

CRPP was implemented in Maputo following the overlapping process of data collection, stakeholders' engagement, analysis, diagnosis and recommendations for action. The Focal Points led data collection efforts through data mining, technical meetings and multi-sector workshops. The workshops in particular aimed not only to populate necessary data, but also to engage and train municipal technicians and councillors, as well as other relevant stakeholders, on urban resilience and its transversal nature.

From the progressive stages of data collection stems the City Snapshot, which provides a general contextual overview, as well as the Resilience Profile, which includes performance and stakeholder analysis. These were brought together in a diagnosis, which was presented and verified during the Diagnosis workshop held in November 2018. The main outcomes of this workshop are the Lines of Action, on which the Actions for Resilience (A4R) are based. In March 2019, the proposed actions were presented to the relevant stakeholders through the Actions for Resilience workshop to reach a consensus on a roadmap towards Maputo's resilient and sustainable urban development. These efforts culminated in an official launch of the City Profile and Recommendations for Actions for Resilience and Sustainability (RAR-S) at the end of March 2019.



**Image 1:** April 2018. UN- Habitat / CRPP and Directorate of Global Justice and International Cooperation of the City of Barcelona visit to Chamanculo Neighbourhood. Source: CRPP (2018).

Figure 1: Timeline of CRPP Implementation in Maputo.



- Milestone events
- Major stages in implementation
- Other workshops / training missions
- Maputo participation in events

**05.10.2016**

Maputo's Mayor assigns the City Resilience Profiling Programme (CRPP) to work within the Department of Urban Planning and Environment, with the Councillor for Urban Planning and Environment leading the normative and legal issues related to the Programme.

**11.11.2016**

First meeting with the Councillor of Urban Planning and Environment Department to present the initiative and discuss the possibilities of implementing the Programme. Two Focal Points within the Municipality are assigned to support the implementation of the City Resilience Profiling Tool (CRPT).

**14.06.2017**

Meeting with the Mayor and the Councillor of Urban Planning and Environment to discuss the initiative and the possibilities of implementing the CRPT. Second meeting with Councillor for Urban Planning and Environment and the assigned municipal Focal Points to explain in detail the initiative and the necessary efforts required to achieve a successful implementation.

A Memorandum of Understanding (MoU) between UN-HABITAT and the Maputo City Council is jointly prepared.

The municipal Focal Points agree and understand their role throughout the implementation of the CRPP in the Municipality.

**19-23.06.2017**

City Resilience Profiling Programme (CRPP) and City Resilience Profiling Tool (CRPT) training in Barcelona. The Programme Focal Point in Maputo receives training on the overall approach of the CRPP and CRPT.

**17-23.09.17**

First mission to Maputo

First mission to Maputo with three main objectives:

- Official launch of the project (implementation of the CRPP);
- Training for municipal officials who will participate in the implementation of the CRPP.
- Share the experiences of the City of Barcelona in regard to implementing the CRPP and incorporating resilience-informed processes more broadly.

**19.09.2017**

Meeting with Maputo's Mayor and representatives of the City of Barcelona. Partnerships are strengthened within the scope of the CRPP between the City of Barcelona, Municipality of Maputo, and UN-Habitat.

**20.09.2017**

The CRPP is officially launched by the Mayor of Maputo. Relevant partners (academia, national government, European Commission, World Bank and private sector) participate in, and media coverage is present (radio and TV) for, the launch of the project. More than 60 people participate in the event: municipal technicians, city councillors, heads of departments, cooperation and development partners in (World Bank, European Commission), and Central Government (Ministry of Environment, National Institute of Disaster Management, National Institute of Ministry of Public Works, Housing and Water Resources, Ministry of State Administration and Public Function).

Among the publicity surrounding the event, it is important to highlight interviews with the mayor of Maputo as well as certain technical representatives who participated in the workshop<sup>1</sup>.

Other interested parties:

- ICLEI – Local Governments for Sustainability
- AdeM - Water for the Region of Maputo
- Academia (Eduardo Mondlane University)
- UNDP – United Nations Development Programme
- GIZ – German Society for International Cooperation

Establishment of a CRPP network (names, e-mails, telephone numbers, name of institution and responsibility) -- through the filling in of attendance sheets -- and the Maputo Resilience Board.

The Mayor of Maputo expresses the need to establish a Resilience Unit in the Municipality as a way to capture the lessons learned from the CRPP implementation and build a better understanding of the concept of resilience in the Municipality.

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<sup>1</sup> Urban Resilience Hub by UN-Habitat, (2017), Resilient Cities Series: Full interview with Mayor of Maputo: [www.youtube.com/watch?v=3UvK42FPFEM&feature=youtu.be](http://www.youtube.com/watch?v=3UvK42FPFEM&feature=youtu.be)

## 11-14.04.2018 Second mission to Maputo

A meeting is held with the technical departments of the Directorate of International Relations and the Directorate of Global Justice and International Cooperation of the City of Barcelona. During this visit, a meeting is also held with the new director of the UN-Habitat Mozambique office. Lastly, a meeting is held with the Maputo City Council. Participants include Councillors of the Urban Planning and Mobility Departments, municipal Focal Points, and the technical department of the Directorate of International Relations, who explain the process of creating the Resilience Department of Barcelona within the Municipality.

Also during this visit, a meeting is held with the Spanish Agency for International Cooperation for Development (AECID) to evaluate the possibility of participating in a joint project to support the creation of an inclusive, sustainable, resilient and equitable public transport system in the metropolitan area of Maputo.

Different field visits are also carried out, such as to the informal settlement in the neighbourhood of Chamanculo, in which a project to organize and obtain DUATs<sup>2</sup> by the NGO Architecture Without Borders was being implemented. Field visits included different markets, such as the Central Market and the Romão market, the latter which has a project implemented by the Red Cross supporting the Municipality through community actions that promote public health and the improvement of environmental management of the Mbuzine, Mavalane and Romão markets. This visit is carried out jointly with the Red Cross and the Commission of Vendors. Also, the cultural centre of Ntsindya is visited, where the rehabilitation of the building allows cultural activities, serving as a venue for featuring Mozambican culture.

Together with Engineers Without Borders, visits were organised to the Ka Maxaquene district, where a project to improve the collection of solid waste is being carried out, as well as the recycling centre, Comsol. A meeting is also held with the MAIN STOP Foundation, an organisation dedicated to affirming the rights and "empowerment" of young women.

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<sup>2</sup> There is no private ownership of land in Mozambique. Land and its associated resources are the property of the State. However, laws governing land use allow private use rights to land, referred to as Direito do Uso e Aproveitamento da Terra (DUAT). Although land itself cannot be sold or leveraged in any way, improvements built on land may be leveraged (e.g. mortgaged) and sold (World Bank).

## 21.09.2018

A meeting with the European Commission (EC) in Mozambique is held, where implementation progress is reported and effective forms of collaboration with the EC in the country under the Programme framework were discussed.

During October and November, the CRPP technical team (in Barcelona and Maputo) analysed collected data as well as relevant legal documents (policies, strategies, etc.). Several meetings with different municipal departments related to critical areas (based on the level of vulnerability revealed through the data analysis) were held, in order to work together towards a more detailed analysis and diagnosis of each identified critical area.

On December 10, 2018 the fifth municipal elections in Mozambique takes place. The new Chairman of the Board of Directors takes office in February 2019. Thus, during the final months of CRPP implementation, there remains uncertainty regarding working counterparts until the new team is operational.

## 21-23.11.2018

### Third mission to Maputo

Presentation of the data collection stage of all CRPT elements and benchmarking results. During this visit, a new municipal Focal Point is presented.

Two working sessions and discussion were scheduled with slightly different target groups. As new staff entered the implementation process, a slightly different approach was adopted.

On the first day, attendees include municipal technicians and external actors (NGOs, INGC, etc.). A summary of the whole process is presented, as well as the prioritised critical thematic areas that have been defined. A consensus is reached on the preliminary Lines of Action on which further Actions for Resilience (A4R) are to be outlined.

In the second session, the group from the first day participate together with municipal decision makers (Councillors). Conclusions drawn from the previous technical discussion include the thematic Lines of Action.



**Image 2:** November 2018. Resilience Diagnosis Workshop in Maputo. Source: CRPP (2018).



## 25-27.03.2019 Fourth mission to Maputo

An official mission to close the project is held. There is a meeting in the Honourable Hall of the Municipal Council that includes the Mayor of Maputo City, the Councillors of departments most critical to the CRPP process, CRPP representatives and technicians, as well as representatives from the City of Barcelona and technical Focal Points in Maputo.

CRPP technical staff present the three phases of deliverable that underpin the implementation process are explained:

1. Delivery of the CPPT databases to the Municipality of Maputo;
2. Delivery of the digital platform (password-protected access) of graphics related to the analysis process and City Profile;
3. Submission of the final report of Recommendations of Actions for Resilience and Sustainability (RAR-S).

With regards to dissemination and communication processes, it is important to highlight the interviews conducted with the new Mayor, as well as selected workshop participants and the municipal Focal Point.



**Image 3:** March 2019. Visit to a market project (implemented by the Red Cross). Source: CRPP (2019).



**Image 4:** March 2019. Official presentation of the Actions for the Resilience for Maputo City. Source: CRPP (2019).



## Technical Meetings and Multisectoral Workshops

The CRPP promotes inclusive municipal governance that is capable of promoting effective participation and equal rights in all fields and in leadership at all levels of decision-making, including in local communities. The CRPP is strengthening the capacity of Maputo Municipal authorities and technicians to implement effective local governance by providing them with the authority and resources to manage critical urban concerns.

Three municipal Focal Points have worked directly with the CRPP throughout the process, thus gaining insight into how to manage city issues through the implementation of the CRPT and the development of the City Profile. The technicians and municipal councillors, relevant stakeholders, and development partners were trained on CRPT methodology, process and objectives; the main risks in Maputo were prioritized, and relevant stakeholders were initially mapped.

In addition, sector-specific training and technical workshops were carried out during the implementation of the CRPT to help inform the City's context and support diagnosis. For each component of the CRPT, a technical workshop was organised to bring together all relevant local authorities, technicians and stakeholders to discuss, learn and analyse systemic challenges addressed through the CRPT.

For the implementation of the CRPT in Maputo, specific measures were taken:

- Training in data collection for municipal Focal Points
- Development of an internal work plan
- Identification of data sources
- Multisectoral meetings: preliminary meetings with specific municipal departments (Head and technical team) to present the CRPT and explain the need for data and frameworks of action
- Obtaining a list of contacts from each department or sector to monitor data collection
- Identification of stakeholders relevant to data collection
- Holding of meetings with identified stakeholders and evaluation of the possibility of obtaining data

Below are the technical seminars and workshops that were held:

Technical seminars and workshops			
Date	Technical Workshop	Activities /Results	Number of participants
25.01.2018	Validation of Set 1 and development of Maputo City Profile	Sectoral working groups organised by Urban Element to provide missing data, evaluate and validate data and sources. Discussion of Resilience Profile for Maputo.	30
12.03.2018	Mobility	Discuss the sources for the required data and coordination with the Municipality for data collection and validation, including GIS and maps.	5

Date	Technical Workshop	Activities /Results	Number of participants
11.04.2018	Set 4: Mobility, Ecology and Built Environment	Sectoral working groups organised by Urban Element to provide missing data, evaluate and validate data and sources. Academia provides an advisory role shares recent, relevant studies and other sources. Concepts related to Ecology and Built Environment are explained and discussed within the context of Maputo.	24
29.05.2018	Set 4: Basic Infrastructure, Municipal Public Services and Economy	Sectoral working groups organised by Urban Element to provide missing data, evaluate and validate data and sources. A high level of participation is achieved (for instance, Municipal Directors are present). The creation of the Resilience Unit within the Municipality of Maputo is discussed.	25
04.07.2018	Workshop on the Establishment of a Resilience Unit in the Municipality of Maputo	Intersectoral Dialogue on the Creation of an Urban Resilience Unit within the Municipality of Maputo. With the attendance of some representatives of different municipalities of the Municipal Governors City Council, as well as UN-Habitat representatives. The need to create an Urban Resilience Unit / Office / Sector / Department / Division in the Municipality of Maputo is agreed.	14
11.09.2018	Set 4: Municipal Public Services and Supply Chain and Logistics.	Sectoral working groups organised by Urban Element to provide missing data, evaluate and validate data and sources. Main issues per Urban Element (Municipal Public Services and Supply Chain and Logistics) are identified.	28
14.09.2018	Set 4: Social Inclusion and Protection and Basic Infrastructure	Sectoral working groups organised by Urban Element to provide missing data, evaluate and validate data and sources. Continuity of work with other elements (Municipal Public Services and Supply Chain and Logistics).	36
21.11.2018	Analysis & Diagnosis Workshop	Presentation of the data collection stage of all CRPT elements and benchmarking results. Dialogue among technicians, municipal authorities and stakeholders on Maputo's potential stresses and shocks, their general spatial distribution, relationship to existing policies, and how they influence the resilience and sustainability of the city.	31

Date	Technical Workshop	Activities /Results	Number of participants
22.11.2018	Analysis & Diagnosis Workshop	Coordination of multisectoral discussion to strengthen the implementation of local legislative and monitoring capacities. Recommendations are raised to improve the above-mentioned aspects.	25
23.11.2018	Analysis & Diagnosis Workshop	1. Evaluation of the identified Lines of Action -- critical thematic areas -- from which concrete actions must be delineated (Recommended Actions for Resilience - A4R). It is agreed that the Lines of Action are: Urban Informality, Solid Waste and Water Cycle Management, Transport and Urban Mobility, and Ecosystem Management and Recovery.	56
25.02.2019 07.03.2019	Recommended Actions for Resilience Workshop	<p>Short presentation of the process to the new councillors justifying why the thematic Lines of Action have been identified and which concrete actions are outlined (Actions for Resilience - A4R). Considering that a new phase of management begins within the Municipality, it is an opportunity to implement concrete actions agreed upon by technicians and municipal officials, including the internal organisation of the Municipal Council in the creation of a Resilience Unit (RU).</p> <p>Presentation of the entire implementation process to new decision-makers as well as the A4R proposal.</p>	37



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**Urban Resilience Hub by UN-Habitat**, (2017), Resilient Cities Series: Full interview with Mayor of Maputo. Youtube video file. Available at: [www.youtube.com/watch?v=3UvK42FPFEM&feature=youtu.be](https://www.youtube.com/watch?v=3UvK42FPFEM&feature=youtu.be)

# Annex II

**City Characterisation**





## List of figures

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- Figure 1** City of Maputo location. Source: CRPP based on Google Maps information (2019).
- Figure 2** Territorial map, showing the administrative boundaries of the city of Maputo, its seven districts and respective neighbourhoods. Source: CRPP (2019) with information from the CRPT data collection process.
- Figure 3** Distinct built footprint morphologies in Maputo. Source: CRPP based on Google Maps data (2019).

## List of tables

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- Table 1** Key information regarding the city of Maputo. Source: Elaborated by CRPP (2019) with information from the CRPT data collection process.
- Table 2** Districts and neighbourhoods' information. Source: Elaborated by CRPP (2019) with information from the CRPT data collection process.

## List of acronyms and abbreviations

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- CRPP** City Resilience Profiling Programme
- CRPT** City Resilience Profiling Tool

**Figure 1:** City of Maputo location. Source: CRPP based on Google Maps information (2019).



# Annex II

## City Characterisation

The city of Maputo is the capital of the Republic of Mozambique located in south-eastern Africa. It is also the largest city and main financial, corporate and commercial centre of the country. As illustrated in Figure 1, Maputo is located in the extreme south of Mozambique near the border with South Africa and the border with Eswatini (formerly Swaziland). The city is placed on the western shore of Maputo Bay, bordered by the Indian Ocean.

The city of Maputo consists of an area of 347 km<sup>2</sup> located at 47 meters above sea level. It features a tropical Savanna Climate and presents annual variability in weather and precipitation stemming from the two climatic seasons of the region (summer and winter): hot and rainy weather in summer (from October to April) and a slightly colder and drier winter (from May to September). The average annual precipitation is around 781 mm, with the maximum average monthly rainfall occurring in January (125.8 mm) and the minimum (13.1 mm) occurring in August. During summer the average temperature is around 30°C to 31°C and precipitation during the months of November to March represents 73% of the average rainfall. In the winter season the average temperature is about 25°C to 26°C during the months of July and August, with scarce precipitation (average values do not exceed 20 mm between May and September). Southwest winds prevail in the summer while northwest winds are predominant during the winter. These climatic characteristics combined with Maputo's geographical position open to the Indian Ocean, as well as other biophysical features (e.g. steep slopes and areas prone to landslides, wetlands and mangroves, environmental degradation), intensify the occurrence and effect of extreme events, such as floods, cyclones, heat waves, droughts and erosion.

Regarding demographic and socioeconomic characteristics, it is important to highlight the high birth and immigration rates leading to increasing socioeconomic challenges for the local government, such as provision of services, infrastructure and food supply. Table 1 below presents key summarized information concerning Maputo's biophysical, demographic and socioeconomic characteristics.

Key information	
<b>Area:</b>	347 km <sup>2</sup>
<b>Altitude:</b>	47 meters above sea level
<b>Köppen-Geiger climate classification:</b>	Tropical Savanna Climate
<b>Average Monthly Temperature:</b>	23°C
<b>Average Annual Precipitation:</b>	781 mm
<b>Annual Average Relative Humidity:</b>	66.6%
<b>Population Size:</b>	1, 273, 076 inhabitants
<b>Population Density:</b>	3,648 inhabitants/km <sup>2</sup>
<b>Life Expectancy:</b>	59.4 years
<b>Literacy Rate:</b>	9.5 %
<b>Main Economic Sectors:</b>	Agriculture, Industry, Tourism and Services

**Table 1:** Key information regarding the city of Maputo.

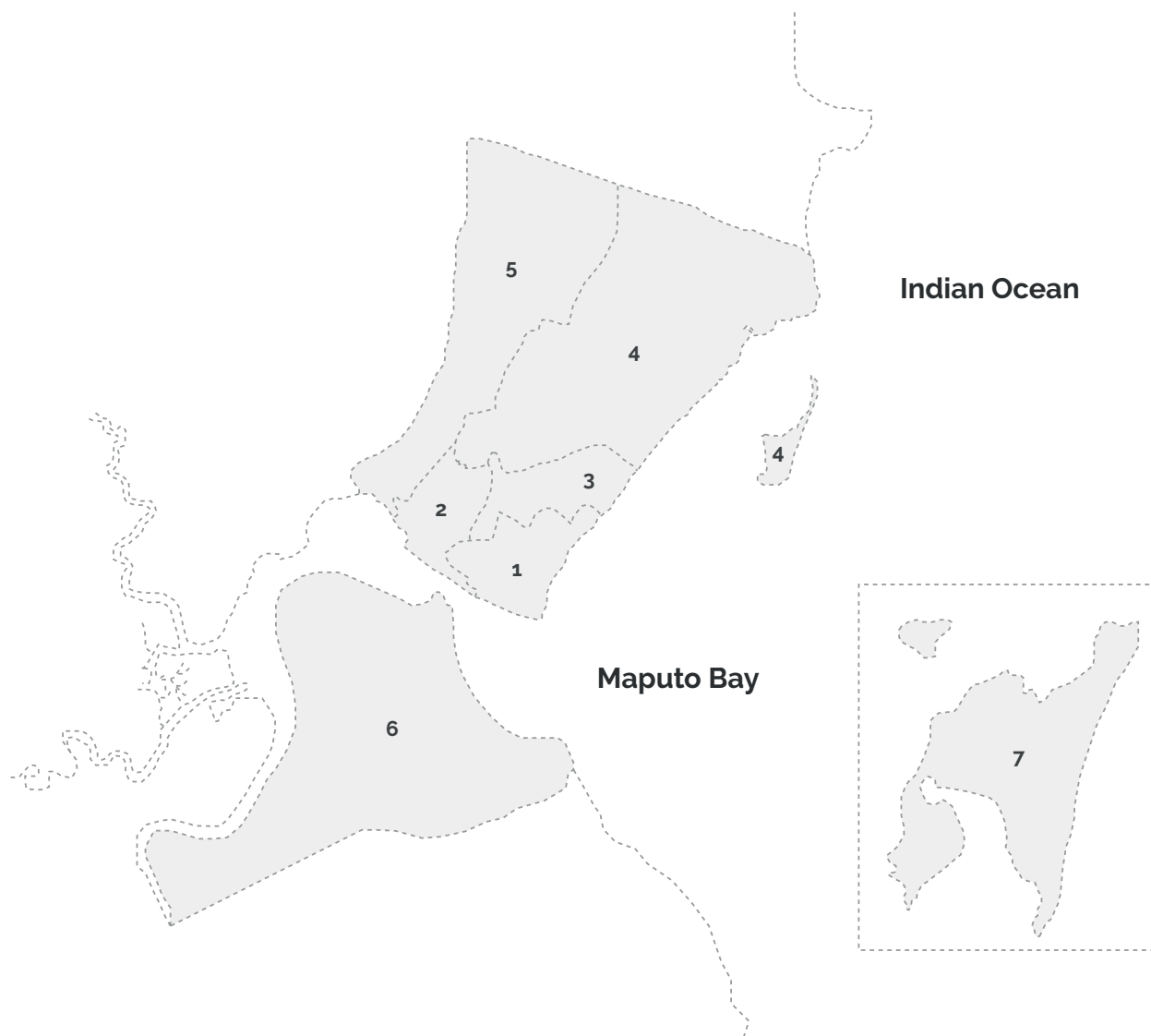
Source: Elaborated by CRPP (2019) with information from the CRPT data collection process.

Maputo is divided for administrative purposes into seven municipal districts and within each district that are neighbourhoods, as characterized in the Figure 2 and Table 2.

Code	District	Neighbourhoods	Population	Area
1	Urban District of KaMpfumo (previous number one)	Central A, B and C; Alto Maé A and B; Malhangalene A and B; Polana Cimento A and B; Coop and Sommerschild.	80,550 inhabitants	12 km <sup>2</sup>
2	Urban District of Nihamankulu (or Chamanculo, previous number two)	Aeroporto A and B; Xipamanine; Minkadjuíne; Unidade 7; Chamanculo A, B, C and D; Malanga and Munhuana.	129,306 inhabitants	8 km <sup>2</sup>
3	Urban District of KaMaxaquene (or Maxaquene, previous number three)	Mafalala; Maxaquene A, B, C and D; Polana Caniço A and B and Urbanização.	199,565 inhabitants	12 km <sup>2</sup>
4	Urban District of KaMavota (or Mavota, previous number four)	Mavalane A and B; FPLM; Hulene A and B; Ferroviário; Lulane; 3 de Fevereiro; Mahotas; Albazine and Costa do Sol.	331,968 inhabitants	108 km <sup>2</sup>
5	Urban District of KaMubukwana (or Mubukwane, previous number five)	Bagamoyo; George Dimitrov (Benfica); Inhagoia A and B; Jardim; Luís Cabral; Magoanine; Malhazine; Nsalane, 25 de junho A and B; and Zimpeto.	321,438 inhabitants	53 km <sup>2</sup>
6	Municipal District of KaTembe (or Catembe, previous number six)	Gwachene, Chale, Inguice, Ncassene and Xamissava.	32,248 inhabitants	101 km <sup>2</sup>
7	Municipal District of Distrito KaNyaka (or Inhaca, previous number seven)	Ingwane, Ribjene and Nhaquene.	6,095 inhabitants	52 km <sup>2</sup>

**Table 2:** Districts and neighbourhoods' information.

Source: Elaborated by CRPP (2019) with information from the CRPT data collection process.



**Figure 2:** Territorial map, showing the administrative boundaries of the city of Maputo, its seven districts and respective neighbourhoods. Source: CRPP (2019) with information from the CRPT data collection process.

It is important to highlight how some key historic events have influenced the development of the city of Maputo. Maputo was founded in 1782 as a trading post and in 1898 it became the capital of the Portuguese colony of Mozambique. Throughout the 1940s and 1950s, and especially throughout the 1960s and 1970s, the city expanded commercially, industrially and residentially, benefiting from the economic growth and investment that the colony then enjoyed. Until 13 March 1976 the city was referred to as Lourenço Marques in honour of the Portuguese explorer.

In 1976, the city was renamed Maputo following national independence, a name that comes from the Maputo River, which marks part of the southern border of the country. During the war for the independence of Mozambique, had acquired great resonance through the slogan “long live a united Mozambique from Rovuma to Maputo” (the Rovuma is the river that forms the border with Tanzania, to the north). Following independence, the city experienced a significant influx of population due to the civil war inside the country (from 1977 to 1992) and the consequent lack of safety and infrastructure in the rural areas. High birth rates continued demographic growth trends in the city during the 1980s and 1990s. The war had devastating effects on Mozambican society, not only because millions of people were killed or displaced, but also because the war hindered the consolidation of the state after independence and fostered a chronic economic crisis, the consequences of which can still be felt today. Since the end of the war, the economy in Mozambique has improved significantly, but the country is still extremely aid-dependent.

The historic development of the city also influenced the urban form of Maputo, specifically the configuration of two social-spatial realities: the Cidade de Cimento (City of Cement) and the Cidade de Caniço (City of Reed). The city of cement consists of the Portuguese historic core, where the city originated and therefore where key heritage buildings are located. However, in the city's origins, the local native black population was not allowed to live within the ‘city of cement’ and was forced to reside outside this area, leading to the formation of an exterior fringe. During this period, a differentiation concerning the type of construction material used began: the black population built their houses using woven reed and tin, which led to the name Cidade de Caniço and established a differentiation of status.

Although the ‘city of cement’ and the ‘city of reed’ are no longer established as before, the influences of this social-spatial duality can still be observed, leading to a strong dichotomy between what is named *Áreas Urbanas Desenvolvidas* (Developed Urban Areas), which are consolidated, and *Áreas Urbanas Desenvolvíveis* (Developing Urban Areas), which have lower levels of urbanisation. This duality is also reflected in legal issues concerning land tenure, socioeconomic matters, and service provision. Today, the ‘city of cement’ is still home to the vast majority of institutional, administrative and service buildings. In the peripheral settlements of the city, the coverage of services and infrastructure are far more precarious or non-existent, further highlighting inequalities.

Moreover, the rapid transformation of the territory of Maputo Municipality over the past several decades presents a range of spatial planning challenges regarding both management and the integration of sustainable practices into the physical planning of this city<sup>1</sup>.

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<sup>1</sup> Sopa, A. & Rungo, B., (2005), Maputo - Roteiro Histórico Iconográfico da Cidade

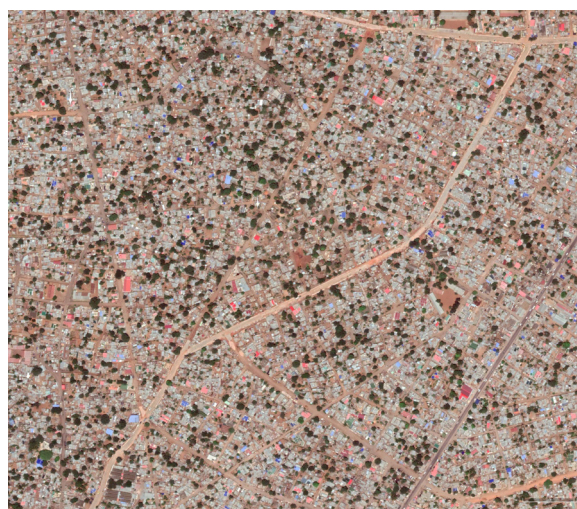


For analytical purposes, it is possible to characterize the city of Maputo's built footprint in three different morphological areas: Developed Urban Areas, Developing Urban Areas and Peri-Urban Areas (Figure 3). This differentiation concerns density, urban development extent and levels of services provision:

- **Developed Urban Areas:** consolidated urban areas with better infrastructure and service provision when compared to other areas of the city
- **Developing Urban Areas:** high-density urban areas, single-family residential typology, precarious or lack of basic infrastructure and public services provision
- **Peri-Urban Areas:** low-density areas, usually single-family dwellings settled in peripheral environments driven by an extensive urban sprawl



**Developed urban area**



**Developing urban area**



**Peri-urban area (KaTembe)**



**Peri-urban area (KaNyaka)**

**Figure 3:** Distinct built footprint morphologies in Maputo. Source: CRPP based on Google Maps data (2019).

It is also important to highlight the Ecological System zones, specifically KaNyaka and KaTembe, that occupy a third of the municipal land. These areas include flood-prone areas, wetland areas, water bodies, areas of natural vegetation (shrublands), parks, gardens and protective greenways. Moreover, these also include areas destined for public services and facilities, including community services (health, educational, cultural, sports, religious services, etc.) and special activities (airport, cemeteries, landfills, military fields, etc.).





## Bibliography and References

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**Sopa, A. & Rungo, B.**, (2005), Maputo - Roteiro Histórico Iconográfico da Cidade. Centro de Estudo Brasileiro.

# Annex III

# Urban Elements Performance Overview

## List of figures

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- Figure 1** Data Collection Assessment (Built Environment). Source: CRPP (2019).
- Figure 2** Benchmark Assessment (Built Environment). Source: CRPP (2019).
- Figure 3** Data Collection Assessment (Supply Chain & Logistics). Source: CRPP (2019).
- Figure 4** Benchmark Assessment (Supply Chain & Logistics). Source: CRPP (2019).
- Figure 5** Data Collection Assessment (Basic Infrastructure). Source: CRPP (2019).
- Figure 6** Benchmark Assessment (Basic Infrastructure). Source: CRPP (2019).
- Figure 7** Data Collection Assessment (Mobility). Source: CRPP (2019).
- Figure 8** Benchmark Assessment (Mobility). Source: CRPP (2019).
- Figure 9** Data Collection Assessment (Municipal Public Services). Source: CRPP (2019).
- Figure 10** Benchmark Assessment (Municipal Public Services). Source: CRPP (2019).
- Figure 11** Data Collection Assessment (Social Inclusion and Protection). Source: CRPP (2019).
- Figure 12** Benchmark Assessment (Social Inclusion and Protection). Source: CRPP (2019).
- Figure 13** Data Collection Assessment (Economy). Source: CRPP (2019).
- Figure 14** Benchmark Assessment (Economy). Source: CRPP (2019).
- Figure 15** Data Collection Assessment (Ecology). Source: CRPP (2019).
- Figure 16** Benchmark Assessment (Ecology). Source: CRPP (2019).

## List of acronyms and abbreviations

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<b>AdeM</b>	Water for the Region of Maputo
<b>ARA-Sul</b>	Mozambique Regional Administration of Waters in the South
<b>CENOE</b>	Regional emergency operation centers of INGC (Mozambique National Institute of Disaster Management)
<b>CRPP</b>	City Resilience Profiling Programme
<b>CRPT</b>	City Resilience Profiling Tool
<b>CSO</b>	Civil Society Organisations
<b>DUAT</b>	Right of Use and Land Use
<b>EDM</b>	Electricity of Mozambique
<b>ESKOM</b>	Electricity Supply Commission
<b>FIPAG</b>	Investment Fund and Heritage of Water Supply
<b>GDP</b>	Gross Domestic Product
<b>GIS</b>	Geographic Information System
<b>HCB</b>	Hydroelectric of Cahora Bassa
<b>IACM</b>	Mozambican Civil Aviation Institute
<b>INAE</b>	National Inspection of Economic Activities
<b>INAMAR</b>	National Maritime Administration and Inspection Service
<b>JICA</b>	Japan International Cooperation Agency
<b>MTA</b>	Maputo Metropolitan Transport Agency
<b>MZN</b>	Mozambican metical
<b>PEUMM</b>	Urban Master Plan of Maputo Municipality
<b>PM10</b>	Particulate Matter 10
<b>SADC</b>	South African Development Community
<b>SENSAP</b>	National Service of Public Safety
<b>SI</b>	Supporting Indicators
<b>SIP</b>	Social Inclusion and Protection element
<b>TDM</b>	Telecommunications of Mozambique
<b>TPM</b>	Public Transportation of Maputo
<b>TPM</b>	Transportes Públicos de Maputo

# Annex III

## Urban Elements Performance Overview

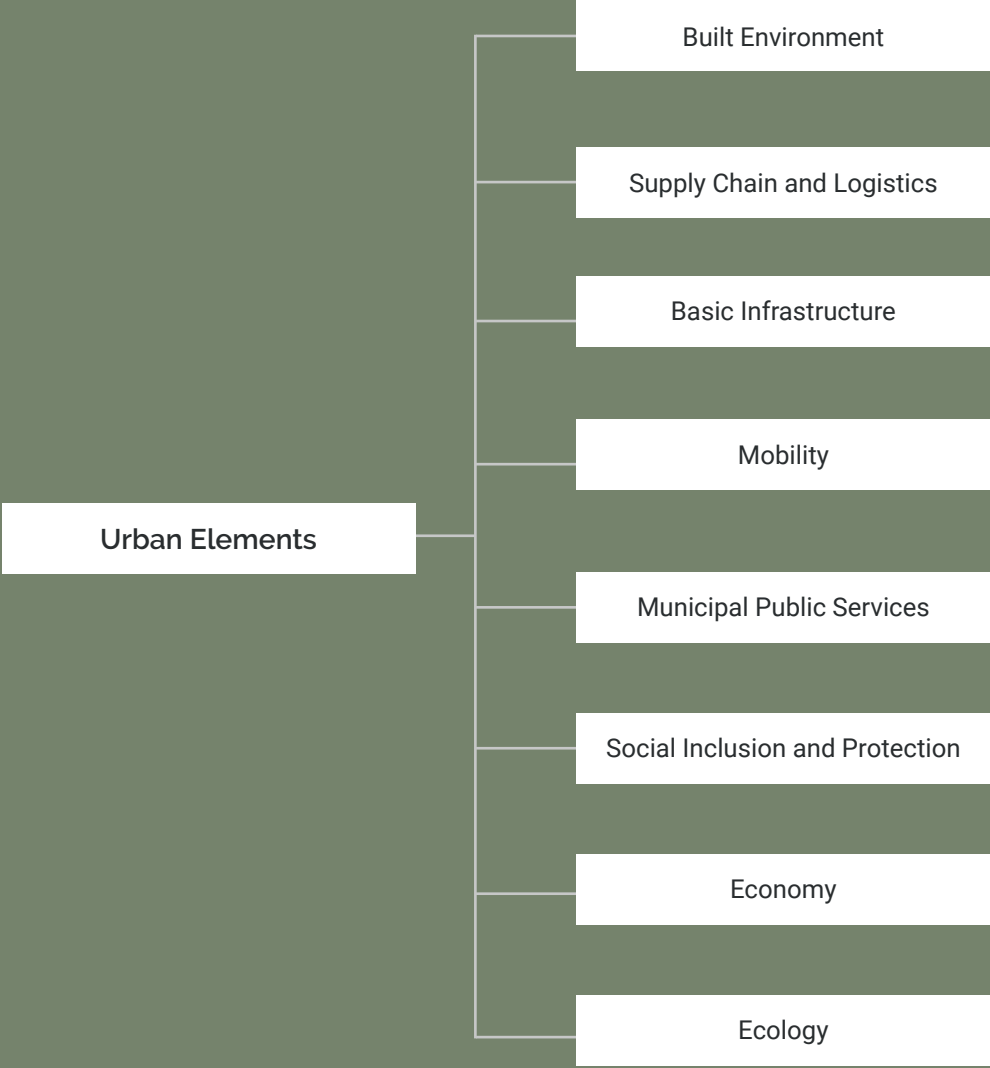
### Introduction

This section provides a high-level overview of the data collected, benchmarked, analysed, and distilled into key findings for each of the eight Urban Elements that comprise the urban system's performance. In addition, key information that is not directly collected through indicators and related questions but provides critical information for better understanding certain complex urban dynamics, is presented herein primarily as a means to further contextualize data findings for each city.

Element overviews are intended to provide a high-level snapshot, not comprehensive analyses. Consequently, all identified vulnerabilities, capacities, and data-related complications are not presented in these overviews. Key findings should therefore be understood as data-borne highlights that have been extracted because they are indicative of common trends identified in more exhaustive data analyses.

Each element overview is comprised of six sections:

<b>Element description</b>	A brief explanation of the scope of the element and its component composition.
<b>Key Contextual Information</b>	Narrative description of the city which includes key information that may not have been directly collected through the SETs.
<b>Data Collection Assessment</b>	Summation of data collection completion results, overview of data completion by component, and key findings suggested by data completion. Completion is calculated using three categories: Complete, Alternative, and Not Available. Complete refers to data sufficient for calculating a benchmark; Alternative refers to data insufficient for calculating a benchmark but nonetheless beneficial for the analysis; Not Available refers to data that was not collected.
<b>Benchmark Assessment</b>	Broken into brief summaries of each component, provides a high-level assessment of the performance of an element based on quantitative measurement of the data collected against established benchmarks. Benchmarks range from 'green' (indicating positive performance or potential capacity) to 'red' (indicating poor performance and potential vulnerability). Indicators that have been informed by qualitative reading, such as through alternative data, are also included in the assessment.
<b>Exemplary Indicators</b>	Selected supporting indicators that are indicative of broader trends discussed in the element overview.
<b>Key Findings</b>	Executive summary of key takeaways related to all available data. Findings may relate to data collection, performance, contextual factors, or some combination.



## Built Environment

The Built Environment Element analyses information spanning the urban footprint and its growth and composition, then proceeds to delve deeper into the aspects of land tenure, housing, and built assets.

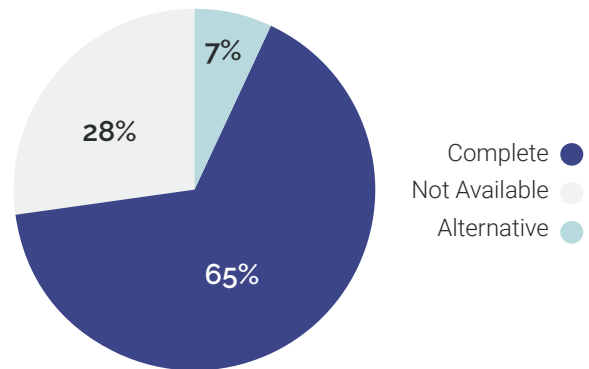
### Key Contextual Information

Maputo's urban area originated in the now lower-central part of the city, before expanding outwards along the main streets and eventually forming the City of Cement (where the majority of infrastructure, services and administrative buildings are still located today) and a peri-urban fringe named the City of Reed (see Annex II. **City Characterisation**). Moreover, the largely uncontrolled growth of Maputo over the past few decades has reinforced an urban configuration that is divided into two key social-spatial realities: the Áreas Urbanas Desenvolvidas or developed urban areas (consolidated urbanization) and the Áreas Urbanas em Desenvolvimento or developing urban areas (precarious level of urbanization). This differentiation has marked effects in the current land use, as well as the future development trajectory of the city, reflected in the Urban Master Plan of Maputo Municipality (PEUMM, 2018).

### Data Collection Assessment

Data is available and Complete for 65%, with a 7% of data considered Alternative. Due to the absence of certain key data, there is significant dependency on Alternative data and documentary analysis to supplement needed information. Data collected is primarily derived from the decade-old PEUMM and limited to the boundaries of Maputo City, which does not include the adjacent city of Matola or District of Marraceune, which are part of the contiguous urban footprint. Furthermore, there is conflicting information derived from a lack of consensus among stakeholders regarding geographic terminologies used in and around the municipality.

Spatial data is an essential aspect of the data collection process, however, access to these were limited. Some information about hazardous areas and inadequate housing exists, albeit not linked to spatial mapping, and data on built assets is limited to only a few types and areas, preventing an overall assessment. While collection of spatial data for various indicators was attempted by CRPP through GIS analysis from available maps, results were limited due to conflicting and missing information. More thorough subsequent analyses can be performed to improve accuracy and completion of these spatial data.

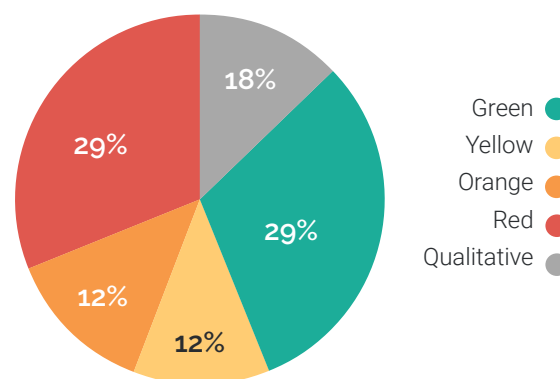


**Figure 1:** Data Collection Assessment (Built Environment).  
Source: CRPP (2019).



## Benchmark Assessment

While the element is evenly split between capacities and vulnerabilities based on the benchmarks of measurable data, the proportion of Not Available data limits conclusive analysis and potentially skews overall perception of the element. Indeed, review of the 'qualitative' data suggests lower performance than is captured through benchmarking alone.



**Figure 2:** Benchmark Assessment (Built Environment).  
Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
1.1.1.2	Percentage of urban footprint located in hazardous areas	25%	Red
1.2.1.2	Percentage of city area considered informal	60%	Red
1.2.1.3	Percentage of informal land under land tenure formalisation	40%	Yellow
1.2.3.2	Does the city authority in charge of land recognise and practice continuum of land rights?	Yes	Green
1.3.1.1	Percentage of homes in hazardous location	35%	Red
1.3.1.2	Percentage of homes with inadequate structure	18.70%	Yellow

## Urban Form

Maputo City presents considerable vulnerabilities due to unplanned urban growth. Over the last 20 years, its urban area has expanded by 35%, significantly exceeding population growth rate and resulting in relatively low population density, particularly in the peripheral areas of the city. This indicates low land efficiency attributed to a sprawling residential urban expansion. Áreas Urbanas Desenvolvidas comprises only 10% of the urban area (3% of municipal territory), while the remaining 90% remain less developed. Furthermore, a significant percentage of the urban area (25%) is now located in areas deemed environmentally sensitive, particularly in Catembe and Inhaca. These peripheral areas, that are currently being threatened by continuous urban expansion, contain most of the available green and open areas located in Maputo, which, in aggregate, give the city a relatively high open space per capita. However, there is poor distribution of green and open areas in the more populated parts of the city.

## Land Tenure

Land in Mozambique is state-owned, with individual rights to use land granted through the Direito de Uso e Aproveitamento de Terra (DUAT) – Right of Use and Land Use -, which recognizes and protects rights acquired by different types of occupation, customary norms and practices for over 10 years, and inheritance. However, a DUAT can only be acquired for areas included in urbanisation plans or have a basic level of urbanisation (demarcated plots, accessible by motorized transportation and pedestrians, connection to water, and trees on the streets). In Maputo, only 40% of the urban area has formally demarcated plots and only an estimated 20% of the population has their property properly registered. Furthermore, a high percentage (70%) of households is estimated to live in informal settlements, which has continued to proliferate due to a variety of factors including poor land management and enforcement. While significant efforts to upgrade land tenure exist at the local level, complying with standards for meeting a basic level of urbanisation remains difficult, particularly for lower-income populations.

## Housing

Although there is a relatively low quantitative housing shortage (7.20%) in Maputo based on the ratio of existing houses and households, a majority of households in the city (70%) live in informal settlements that typically feature slum-like conditions and lack service provisions. Furthermore, 35% of housing is located in low-lying and marshy areas susceptible to flooding, and 19% are made of precarious materials, indicating inadequate quality of housing in the city. While no specific data exists on affordable housing stock, consultations with city officials suggest that the cost of new housing in Maputo is considered unaffordable due to the expensive land market and lack of space for new housing. Such economic conditions consequently resulting in informal construction in low-cost areas which do not respect urban plans.

## Built Assets

Available data regarding Built Assets is severely limited. While national level data on these assets are available from national statistics and reports, the lack of specific detailed information on the physical quality, location and distribution of Maputo's critical facilities and key buildings suggests a poor level of awareness at the local level. Since a significant amount of urban area is unplanned and located in hazardous areas (35%), it is essential to understand potential vulnerabilities these assets have as well as the dangers or capacities they may present to their surroundings, especially when coupled with information on the spatial distribution of the population.

## Key Findings

- The rapid transformation of Maputo in the last few decades presents a difficult challenge to the planning of the territory. Its growth has led to increased low-density sprawl as well as the promulgation of informal settlements.
- Urban expansion, both unplanned and planned, is continuously pushing into hazardous and environmentally-sensitive areas, increasing vulnerabilities and decreasing restorative and defensive services provided by the ecosystem.
- There is a clear delineation between the developed and developing areas of the city, a differentiation characterized both spatially and by inadequate urban infrastructure provision. This has resulted in the uneven and stunted development of a large part of the city, complicated by nationalised and poor land management as well as the multiple barriers in formalizing land tenure.
- Improvement of spatial data and mapping is needed for more thorough assessment of the built environment, particularly regarding the location and distribution of assets, informal areas and urban growth.
- Coupled with the lack of spatial data, population data on land tenure and housing is not sufficiently disaggregated and spatially-linked, which limits the potential for more focused interventions on the most vulnerable groups.

# Supply Chain & Logistics

The Supply Chain & Logistics Element is comprised of four components: Water Resources, Energy Sources, Food Supply, and Urban Logistics. It assesses the access, distribution and management of non-human resources such as supply of food and water, energy and logistics, especially the reliability of access during emergency.

## Key contextual information

The city of Maputo is the logistic centre of Mozambique and the strategic point of connection with the international context. The Port of Maputo serves as the key logistic centre of Maputo and the main goods' entry point of Mozambique, processing the majority of the goods that enter and leave the country. After entry/before export through the Port of Maputo, goods are transported to their final destination/from their point of origin by a combination of smaller vessels, freight rail, or truck. The movement of goods by truck and freight rail is concentrated in the Maputo Corridor that links the country with the South African Development Community (SADC). Goods transported by cargo airplane are handled in the Maputo International Airport.

Maputo is highly dependent on this logistics network especially concerning the food supply. The scarcity of raw materials and crops produced locally results in the city's high dependence on food and goods imported from South Africa, which leads to higher, though relatively stable, prices in the local market.

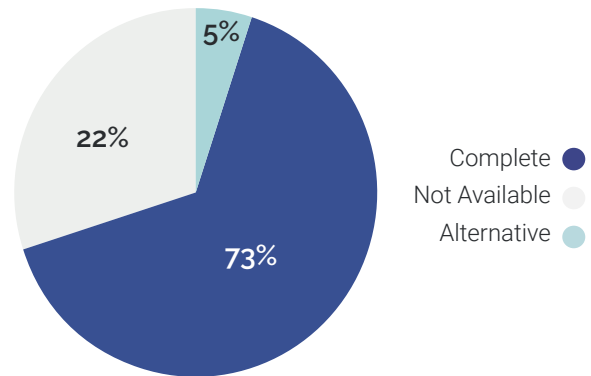
The same supply dependency on the SADC countries is present regarding water, and to a certain extent, energy resources. 60% of the water that supplies Maputo city comes from the Umbeluzi river, a transboundary river basin dependent on water flow from the upstream country of Eswatini (former Swaziland).

While the majority of energy consumed in Mozambique is produced domestically from the HCB's facility in the Cahora Bassa hydroelectric dam, due to a lack of direct connection facilities between Cahora Bassa and Maputo City, this renewable energy has to be exported to South Africa and then reimported to supply Maputo.

## Data collection assessment

Compared to other Urban Elements, Supply Chain and Logistics data collection is largely complete (73% Complete with an additional 5% of Alternative data). However, despite this overall level of completeness, there are discrepancies between components, which is unsurprising given the diversity of topics addressed. For instance, the Food Supply Chain Component and Water Resources Component are nearly complete, thanks to both the quality of data collected at the sub-national level for food supply and the crucial work of Fundo de Investimento e Património do Abastecimento de Água (FIPAG) that provided the majority of data for Water Supply. On the other hand, the Energy Sources and Urban Logistics Components have comparatively lower levels of completeness, due to, in part, a lack of commitment of the stakeholders involved in these fields.

It is important to note that in general, most of the data obtained has its origin in studies and articles available on the internet. Therefore, with the exception of Water

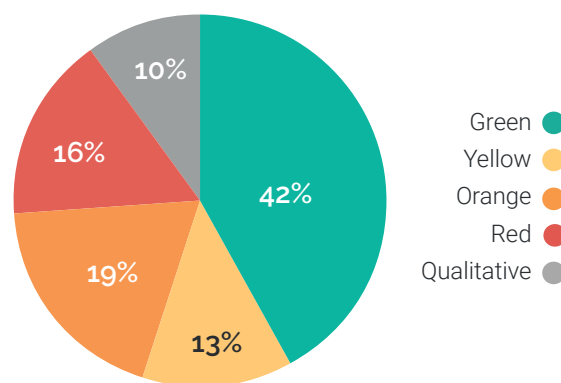


**Figure 3:** Data Collection Assessment (Supply Chain & Logistics). Source: CRPP (2019).

Resources, very little information exists in official documents at either the municipal or national levels. This fact reflects on two concomitant aspects: (i) on the one hand there is little alignment with the contents of this element and existing efforts in the local, regional and national governments or (ii) simply, this element is not a priority for evaluation, analysis and monitoring for better planning.

## Benchmark assessment

As shown in the chart above, the data collected suggests Maputo performs relatively well regarding Supply Chain and Logistics with 55% of measurable data shown to be capacities (42% 'green' and 13% 'yellow') and only 35% shown to be vulnerabilities (16% 'red' and 19% 'orange'). In addition, 10% of supporting indicators contain data capable of supporting a qualitative assessment (as noted previously in this report, 'qualitative' data includes supporting indicators that do not have a benchmark against which to measure performance or do not contain sufficient data for benchmarking but provides data that can nonetheless support the element's assessment).



**Figure 4:** Benchmark Assessment (Supply Chain & Logistics). Source: CRPP (2019).

Highlighted indicators			
No.	Supporting Indicator	Data	Benchmark
2.1.1.1	Proportion of water supplied from each source.	100% Internal + High Variability Reservoir/Dams - 60% Groundwater - 40%	Yellow
2.1.2.1.b	Water consumption per capita (litres/day).	100 l/day p.c.	Orange
2.2.1.1	Proportion of energy consumed from each source, based on shares in total final consumption.		Red
2.2.2.2	Renewable energy share in the total final energy consumption (%).	Not Available	-
2.3.2.3	Proportion of households obtaining food through different avenues. (please disaggregate by sex of householder and groups in vulnerable situations, if possible)	98% informal markets	Red
2.4.4.1	What level of disruptions does the urban logistics network face? (per goods transport mode, if possible) [+]	No disruptions	Green

## Water Resources

According to the data collected, Maputo relies on the seasonal availability of water from the nearby river basins (60% mainly the Umbeluzi river) and on groundwater (40%). The water present in the Umbeluzi river highly depends on both seasonal climatic trends and on the river flow management of Eswatini (former Swaziland), where the river originates. The river feeds water to the Pequenos Libombos dam and ends at the Maputo Bay.

The water supply in the city is mainly managed regionally by ARA-Sul (Mozambique Regional Administration of Waters in the South) and locally by the public companies FIPAG and Aguas de Regiao de MAputo - AdeM (Water for the Region of Maputo).

FIPAG states that in case of extreme water scarcity due to seasonal variability, the priority of provision is given to the Big Five: hospitals, military structures, prisons, national parliament, and the presidential residence. In case of extreme water scarcity (draught), water provision is suspended to agriculture and industrial sector.

In order to have alternative strategies to put in practice in case of unavailability of primary water resources, the government is trying to double the capacity of the Corumana dam on the Sabie river and complete a 60 km pipeline from Corumana to Maputo, as well as to make operational the new Moamba Dam on the Incomati River. Despite these intentions, limited economic resources and government capacity have slowed progress.

## Energy Sources

According to the data collected, in Maputo the majority of electricity from the grid (80%) is used for lighting, while cooking and other used rely mainly on off-grid sources such as coal (70%) and gas (20%).

Even if Mozambique is a large producer of renewable energy (internal production 96% - of which 88% is renewable), there are no direct connections from HCB's plant to Maputo, so power to the city is sold to South Africa's Eskom and re-imported at a higher price. Therefore, the city of Maputo remains dependent on South African infrastructure and vulnerable to fluctuations that may affect diplomatic relations and/or market structures. These findings are supported by the data collection and benchmarking analysis which finds the largest concentration of 'red' benchmarks in the Energy Sources Component.

## Food Supply

Although, in Maputo, vegetable availability is relatively stable throughout the year, there are small variations depending on seasonal crops (e.g. between August-February there is a low variability because the cultivation process begins, while between March-July variability is higher because of the start of the harvesting period).

Cultivated areas in Maputo are quite limited (31 286 Ha) and they are decreasing due to construction of new buildings and infrastructure. Urban agriculture in Maputo is undertaken mainly by poor migrants in the low river floodplains. Not surprisingly, the frequent flooding in recent years has been a major obstacle to its development.

The majority of households obtain food in informal markets, while a minority rely on formal markets and own production. The typical food basket is composed of rice, maize wheat, oil, sugar, dry beans and salt.

The informal food economy is probably the most important source of food in Maputo. Almost all households regularly buy food from informal vendors; more than 90% at least once a week and many daily. For many families, daily purchase is necessary due to unpredictable daily income, lack of accumulated funds, and lack of household refrigeration. This purchase pattern increases the unit cost per item and leads to higher household food expenses.

The informal food economy is not limited to markets and is particularly visible and extensive in the streets and neighbourhoods of Maputo. There exist thousands of street vendors selling a variety of fresh and processed foods, often from the same stall. Within the neighbourhoods, many individual households have small backyard stalls selling the same items in smaller quantities.

In Maputo, maize and rice prices are less volatile (15 mt/kg in the period 2003-2014), albeit always higher than other foods comprising the basic basket because the stability of market supply depends on imports of food from other regions as well as South Africa rather than domestic production. Therefore, while the imported goods are consistently more expensive than those produced domestically, prices are less volatile given the relatively more stable market conditions of South Africa's agricultural sector. In addition, most fresh fruits and vegetables, and processed foods are imported from South Africa.

## Urban Logistics

The majority of goods to and from Maputo pass mainly through the port (Porto de Maputo), which serves as the main port of the country and a logistic node in the region. The port is connected with the Maputo Corridor, where goods are

imported and exported or distributed through the country by freight train or truck. Only a small proportion of goods are processed through Maputo International Airport by cargo airplanes.

Transportation by truck is considered rather dangerous because of the high number of accidents along the national roadway system that connects Maputo to neighbouring cities and countries to the North and South. Similarly, data suggests the Port of Maputo is also exposed to a range of hazards since it is located in a potentially hazardous area. Given the dependency of Maputo's economy and access to basic needs such as food and medicine that relies in large part on the Port of Maputo, ensuring risks are effectively mitigated should be a high priority for the City going forward.

## Key findings

- New strategies ensuring adequate and reliable water supply to Maputo are urgently needed given trends indicating decreasing available resources due to the exacerbation of climate change effects.
- The lack of adequate infrastructure and facilities in the country and in Maputo, due, in part, to limited financial, managerial and technical capacity of the government, has led to a dependence on foreign countries. Such dependence results in the unpredictable supply of resources (food, water, energy) and price volatility.
- Investment in more efficient energy transmission would provide both more market security and reliability in energy distribution.
- Informal food markets, on which the majority of Maputo households, and in particular those most vulnerable, rely, highly depend on crops' seasonal variability. Crop production is additionally affected by natural hazards like drought and floods and by altered climate patterns exacerbated by climate change. The resulting increased variability within crop production presents challenges for both markets (especially those operated informal) and households.
- The high dependence on food imported from South Africa results in higher prices that are not accessible to the majority of Maputo inhabitants, which in turn increases demand in informal food markets supported mainly from domestic agricultural production. A focus on formalizing markets in combination with supporting food production domestically would ensure a more sustainable, affordable, and lucrative marketplace. A reduction in dependence on important food staples would also provide an opportunity for Maputo and the surrounding region to capture a greater proportion of the value added produced throughout the food supply chain.
- While the goods movement infrastructure between Maputo and neighbouring countries appears to be developed and organized, it remains weak between Maputo and the rest of the Mozambique, which relies almost entirely dependent on unsafe road transportation by truck.
- More data is needed to better assess urban logistics as it relates to reliability of access during emergency as understanding the nuances of the vulnerabilities and capacities within this sector is crucial for ensuring city resilience and preparedness.

## Basic Infrastructure

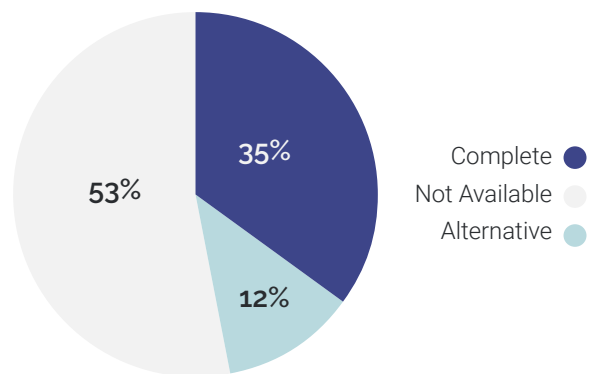
The Basic Infrastructure Element is comprised of 8 components grouped under 4 thematic areas. It analyses information related to Energy Supply in buildings and for mobility, Water from its supply to sanitation and networks of wastewater and stormwater, Solid Waste Management, and the diversity of Telecommunications networks in the city.

### Key Contextual Information

Inequalities between the Cidade do Cemento and its poorer peri-urban areas are reflected in the performance of basic services. A large majority of the 27,000 housing units located in wealthier neighbourhoods have access to the electricity network, sanitation services and water supply on site. On the contrary, in poorer peri-urban areas - and even if the figures differ per neighbourhood - around 30-40% of households lack access to electricity and 70-80% to sanitation. In the case of the Kamatova neighbourhood, up to 64% of households have no access to water supply on site.

### Data Collection Assessment

Given the diversity of topics addressed in this Urban Element, there are important discrepancies between components. For instance, while 53% of data considered is Not Available, this figure largely stems from components addressing Energy Supply, Mobility, and Stormwater, which remain nearly incomplete due to the lack of an identified counterpart in the Municipality. Further notable gaps in data collection include data regarding Operation (Continuity or Efficiency) for components related to Energy Supply, Wastewater, and Telecommunications. As only 35% of the data can be considered Complete and 12% as Alternative, actual performance and the current coverage of the several networks and systems cannot be evaluated in their entirety. Further investigation is needed to obtain a clearer picture of the Urban Element.



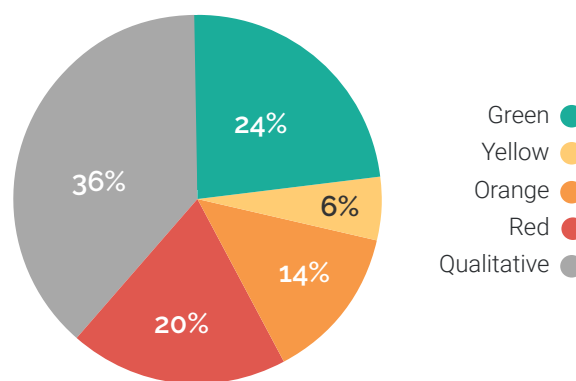
**Figure 5:** Data Collection Assessment (Basic Infrastructure).  
Source: CRPP (2019).



## Benchmark Assessment

As shown in the chart above, based on the level and composition of measurable data collected (e.g. 'qualitative' measures comprise 36% of Completed data), it remains a challenge to provide an accurate overall measurement of the way Maputo performs in regard to basic infrastructure. The 20% 'red' and 14% 'orange' mostly highlight vulnerabilities linked to the lack of, or limited access of, the population to networks and services, and their inappropriate coverage in many components (energy, water supply, wastewater, solid waste).

The 6% 'yellow' indicate some improvements in the supply or delivery of the networks and systems in place, although additional efforts remain necessary to provide adequate services to all. Lastly, the 24% 'green' identify sporadic good practices in several of the components, though should not be considered as indicative of existing practices or trends in this element.



**Figure 6:** Benchmark Assessment (Basic Infrastructure). Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
3.1.1.1.1	Proportion of population with access to any means of electricity supply (Please disaggregate by sex and groups in vulnerable situation, if possible)	63%	Red
3.1.1.1.2	Proportion of population with primary reliance on clean fuels and technology for heating/cooling, lighting and cooking (Please disaggregate by sex and groups in vulnerable situation, if possible)	Alternative answer: For cooking: coal 63.5%, firewood 14.9%. For lightning: electricity 67.7%, oil 24.3%.	-
3.1.1.2.1	Percentage of households with an authorised connection to public network	Not available	-
3.2.1.1.3	Percentage of population with access to water services (Please disaggregate by sex and groups in vulnerable situation, if possible)	50% Safely Managed Services 50% Basic Services	Red

No.	Indicador de Apoio	Dados	Análise Comparativa
3.2.1.1.3	Proportion of household income spent on water, sanitation and hygiene	4.7% 200 MZN per month	Orange
3.2.1.3.1	Percentage of unaccounted for water (water loss).	40%	Orange
3.2.2.2.1	Percentage of households connected to a wastewater network.	10%	Red
3.3.2.1	Percentage of population with regular municipal solid waste collection service (at least once a week) (Please disaggregate by sex and groups in vulnerable situation, if possible)	26%	Red
3.4.2.2.2	Is the city covered by any local, regional or national public broadcasting?	Local Public Broadcasting  National Public Broadcasting	Green

## Energy

Although the percentage of authorised connections to the public network is unknown, 63% of the population have access to any means of electricity supply, including through illegal connections. Of this population, it is estimated that almost 37% of the local population have access to alternative sources of electricity such as generators (it should be noted that the Mozambican central government has launched a national strategy to achieve universal access to electricity by 2030 - *Estratégia Nacional de Energia* –). In terms of domestic usage, and more specifically related to cooking, around 78% of the population is still primarily reliant on inefficient fuels such as coal (63,5%) and firewood (14,9%), which is responsible for the high levels of household indoor air pollution. Concerning private lighting, the majority of households are connected to the public network (68%), while a significant proportion (24%) use oil lamps, which also contributes to high levels of household indoor air pollution.

The maintenance and monitoring of the electricity network appears to be done appropriately, however there is not enough information to adequately evaluate the reliability and efficiency of the network. In addition, it must be noted that not all areas of the city have 24/7 electricity service provision and the network is neither able to cope with seasonal increase in demand nor with the anticipated growth patterns of the city, due to lack of coordination and planning of the stakeholders.

Two additional data points should be noted herein. Firstly, the Municipality is currently engaged in the pilot phase of an integrated natural gas network. The pilot is being implemented in the Aeroporto A neighbourhood, but is not yet fully developed or operational. Secondly, the Maputo City Council has no data on energy supply for public mobility, hindering the analysis of the component.

## Water

### Water supply:

The main responsible body for the water cycle management cycle (capture system, treatment, distribution, installation of water meters and billing) is the FIPAG (Fundo de Investimento e Património do Abastecimento de Água), which is jointly managed by Águas de Moçambique (AdeM) and private operators.

While the FIPAG is making new investment to improve water supply, there is no area in the city with 24/7 water provision, even in the most developed neighbourhoods of the urban area (the average amount is estimated to be approximately 13 hours per day). This shortage leads to the need for significant storage capacity, that if not done adequately can result in water waste and potential contamination, aggravating the already identified malaria issues.

Half of the population (50%) have access to water services through safety managed devices, while the other half have access through basic drinking water services. In terms of households, 55% are covered by the pipework supply network, but only 16% have the connection inside the house. The proportion of household income spent on water is approximately 4.7%, or an average cost of 200 MZN a month, which can be burdensome for household budgets.

Regarding the network, some measures of monitoring and maintenance are applied such as the regular sampling of water, 99% of which result in compliance with drinking water quality standards. Significant disruptions in water provision were reported, though it is not clear if they are due to the inadequacy of the services, drought events, or a combination of both. In 2018, reports indicate 40% of provided water was 'unaccounted for'. More investigation should be performed to understand if this water loss is derived from the inefficiency of the infrastructure or from illegal connections.

Although the network can cope with seasonal increases in water demand, current capacity are insufficient to meet for the needs of the entire region. New sources to increase water supply are necessary and have been identified. The World Bank is now investing in Mozambique fresh water production related to the Corumana dam that should cover 80% of the demand, and in the Moamba dam, expected to be in place by 2030.

### **Wastewater:**

Due to lack of investment in the urban sanitation network, only 10% of households (located in the Cidade do Cimento and part of Bairro do Jardim) are connected to the waste water network. Although 37% of the population have access to septic tanks, mostly used in urbanised and semi-urbanised areas, more than 50% of the population do not have access to safely managed services with adequate treatment.

The existing sanitation network is a combined sewage system that is not able to cope with seasonal increases in wastewater due to a lack of capacity. During the dry season, it the network operates inadequately, which interrupts the proper disposal of wastewater. There is no information regarding the monitoring and maintenance of the network or its efficiency, though general knowledge about the network suggests inefficient operations.

Currently, 75% of the wastewater produced in Maputo Municipality is discharged to the environment without previous treatment and without sampling to evaluate its impact on the environment. 45% of the treated wastewater receives a primary treatment with a discharge exposure considered as high. There is no information available for treatment of hazardous wastewater.

### **Stormwater:**

The city is 20% covered by a combined sewage system which operates at suboptimal speeds during dry season, as discussed in the wastewater section above. 30% of the urban area is covered by a limited street network collection system which discharges directly into open channels and water bodies. Some measures of monitoring and maintenance are in place, but there is no further information to evaluate the appropriateness of the system provided.

There is no information provided regarding either stormwater and flood management strategies or the effectiveness of stormwater solutions currently in place or being considered. However, as Maputo is susceptible to floods and cyclone events that both add pressure on the stormwater system, improved management should be further investigated,

### **Solid Waste:**

Data indicate that 1100 tons of waste is generated per day in the city, 800 of which are collected daily. Of that which is collected, 35% is done so through formal collection, with 26% of the population having regular municipal collection services. Some neighbourhoods in suburban areas have limited access routes that do not facilitate collection services. The City Council is trying to improve waste collection performance by outsourcing the collection to private enterprises,

as well as through the use trucks in the urban core and smaller carts in the peri-urban areas. In addition, more than 500 tons of waste is collected informally daily. The number of waste pickers in the city is unknown, but given that there are more than 500 active waste pickers at the Hulene dumping site alone, combined with the previously estimated amount of informal waste collected, the total number is likely significant.

All public and private institutions that produce waste above 25 kg or 50 litres per day are required to manage their own waste and are obliged to hire collection services from third parties or license their own vehicle for this purpose. Although not reflected in detail in the data entry, some initiatives for the sorting and recycling of solid waste have started to take place, with a sharp increase in recovery trends. These initiatives should be promoted and designed to take place ahead of waste disposal to avoid potential contamination.

The new City Strategy for Solid Waste Management in Maputo was approved in 2006, with the main objective of gradually improving the waste management cycle in the city, including economics-related components. With an initial threshold of 600 tonnes collected per day, this strategy stresses the need for adapting waste collection and waste transportation to different areas of the city, relying also on public-private partnerships (14 small enterprises – 11 of which in the framework of the MMDP project - across 20 neighbourhoods).

The Hulene dump is the only official site for the disposal of solid waste collected in Maputo and is located in a densely populated area, less than 10 Km away from the city-centre, and in proximity of Mavalene airport. It covers an area of approximately 17 Ha, with a garbage mountain that rises approximately 12 meters above the ground (the height of the solid waste sometimes reaches 15m). The facility operates 24 hours per day.

The collapse of the Hulene dump in February 2018 had significant impacts not only on the solid waste dynamics of the city but on the livelihoods and security of the population living in the area. One year after this tragedy, the situation is still being investigated and alternatives are being considered - currently, it has already been signed an agreement with the Japanese government to work together in the closure of the disposal -. Meanwhile, several people are illegally occupying land reserved for the new Matlemele disposal site, interrupting any progress. In addition, the construction process for Matlemele is proceeding very slowly, since it required a lot of efforts of coordination and agreement between the Municipality of Maputo and the Municipality of Matola.

Further investigation is necessary to gain a better understanding of the current solid waste situation in the city – including the management of hazardous waste. However, the information provided indicates existing processes and solid waste systems are inadequate and pose potential environmental and health issues.

## Telecommunication

### Phone and Internet:

While the percentage of the population with access to at least one telecommunication network remains unknown, it appears that more men than women have access to the telecommunication network in Maputo. To guarantee universal access, some efforts are being made by the local government in order to provide wifi in public universities, public libraries and in public locations such as the Jardim Tunduro. There are public phones in the city operated by TDM, however the system does not operate properly.

Although coverage of each network is unknown, mobile phone networks are progressively expanding, with 66% of households having a subscription from one of the three major providers. On the other hand, fixed phone connection has decreased to 0,3%, with only one provider offering this service. The coverage of fixed internet broadband is also extremely low.

There are no major disruptions in the phone networks, however to fully appraise the operational capacities in case of a disruptive event, the total number of providers should be known, especially if there is only one providing the service.

## TV and Radio:

The proportion of the population with access was found to be approximately 57% for both TV and radio. The government applies fees on households receiving broadcasting, which likely explains these low percentages. Although coverage of both networks is unknown, there are 7 nation-wide TV channels operating in the city and 13 radio stations, including local public broadcasting.

Lastly, there is limited information provided regarding whether the local government can engage with broadcast operators in the case of emergency. Furthermore, information on the continuity of broadcasting operations and the existence of maintenance and monitoring measures was not available, thus hindering the full appraisal of the component.

### Key Findings

- **Energy:** the energy system is neither efficient nor reliable. Coal and firewood are still highly used for domestic purposes, causing indoor air pollution problems, which lead to health issues.
- **Water:**
  - Although half of the population is covered by the water network, it is inefficient and unreliable. Improper storage of water leads to health issues and waste of water. Water losses should be further investigated to determine their origins so that the issue can be adequately addressed.
  - Wastewater coverage is highly insufficient and there is no treatment, leading to environmental contamination. Proper solutions should be investigated to respond adequately.
  - There is an insufficient coverage of the city in terms of stormwater solutions, leading to increased impacts from natural events (mostly floods and cyclones). The use of water-sensitive urban design solutions should be promoted.
- **Solid waste:** Collection and treatment are highly inadequate, causing health and environmental issues (e.g. the Hulene's waste disposal case). There is a need to expand the collection system, improve treatment by providing reuse and recycling mechanisms, and establish a disposal site responding adequately to environmental requirements.
- **Telecommunication:**
  - Access to telecommunications networks is not equal between men and women, leading to increasing gender inequalities and lack of opportunities (e.g. economic, informational, educational, etc.).
  - Further investigation is needed to obtain a clearer picture of the telecommunication situation in the city.
- Overall, there is a need to obtain more data and information to better assess the entire performance of the Basic Infrastructure Element, especially in terms of operation, reliability, consumption and effectiveness.

## Mobility

The Mobility Element is comprised of two components: Urban Mobility and Inter-regional/International Mobility. It analyses information on the diversity of transport modes, coverage of infrastructure including networks and critical interchange facilities as well as potential vulnerabilities hindering the performance of the service and the consequent impacts while highlighting capacities.

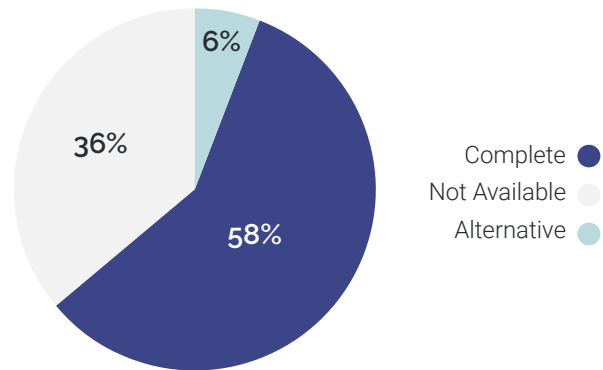
### Key Contextual Information

Located at the entrance of the Maputo Corridor linking major landlocked industrial regions within the South African Development Community with the coast of Maputo, the city of Maputo is quite well connected inter-regionally and internationally through a network of highways and railways. Connecting the ports of both Maputo and Matola, the corridor has, since its opening, stimulated a marked residential and economic growth of Maputo towards Matola, Boane and Marracuán, creating the Greater Maputo Metropolitan area. The pressure posed by the intensity of goods and passenger movement along this route has led to major traffic issues within the metropolitan area of Maputo, exacerbating the already congested urban transportation network.

### Data Collection Assessment

The total completion rate of data collection is 58% with an additional 6% of Alternative data collected. Due to data unavailability, there is notable dependency on Alternative data and documentary analysis to supplement needed information. Available data relate primarily to urban mobility at the metropolitan level and are largely derived from the Comprehensive Urban Transport Master Plan for the Greater Maputo, developed by the Japan International Cooperation Agency – JICA.

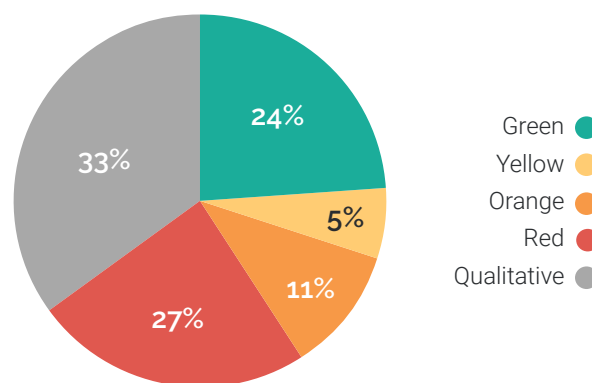
At the component level, data on Inter-regional/International Passenger Mobility are significantly more limited, with a completion rate of 41% (including both supporting indicators and related questions) compared to a rate of 66% for Urban Mobility.



**Figure 7:** Data Collection Assessment (Mobility).  
Source: CRPP (2019).

## Benchmark Assessment

As illustrated in the figure above, and based on the data available, of the measurable data, vulnerabilities (data found to be 'red' or 'orange') total 38% compared to capacities (data found to perform at a 'green' or 'yellow' level), which accounts for 29%. Nonetheless, data available for non-benchmark-able/qualitative information (33%) prove useful to supplement the assessment.



**Figure 8:** Benchmark Assessment (Mobility).  
Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
4.1.1.1	Percentage of commuting trips using each one of the following modes (Private/ Public/ Sustainable)	Private: 11.3% Public: 43.7% Sustainable: 45%	Green
4.1.2.2	Road density used by public transport (km / 100,000 population)	16.36 km/100,000	Orange
4.1.3.2	Is public transport affordable?	No	Red
4.1.35	Average commuting travel time using various modes of transport	1h30m (local area) 2h30m (metropolitan)	Red
4.1.4.7	Transportation fatalities per 1000 population	0.10/1,000 inhabitants	Yellow
4.2.1.1	Percentage of trips using each one of the following modes [inter-regional transport modes]	Not available	-

## Urban Mobility

Urban mobility patterns within the metropolitan area of Maputo are highly influenced by the urban spatial configuration and land use distribution, particularly the distribution of jobs. Spatially, jobs are unevenly distributed in Maputo, with the majority clustered in the central districts (also known as the City of Cement) as well as the central industrial areas of Matola. This spatial concentration causes significant commuting movement from outer districts and sub-urban areas to the central city on a daily basis, hence contributing to the significant traffic congestion and resulting in the main cause of disruption to urban mobility in Maputo, according to the data collected.

Data on modal share show that while there is a sharp increase trend in car ownership, travelling by walking, constituting 45% of total commuting trips, is the dominating mode of movement, followed by buses - namely mini-busses or known as chapas - with a share rate of 33%. Maputo has two official public transport modes: TPM busses and a railway system. The rail system has a very limited coverage and low operation frequency.

Based on the data collected, the share of commuting trips by TPM buses (9%) and train (0.6%) is notably small in comparison to walking and chapas minibuses – the non-official public transport mode in city, technically known as

Paratransit. This evident and significant reliance on chapas is attributed to a number of reasons, but primarily the limited coverage of publicly incentivized bus network –TPM. With a total of 60 routes, operating mainly within the central districts and along the peripheral roads, the TPM network coverage is less than half of that of the chapas network (140 routes).

Data on access to the mobility system demonstrate that while the cost of single fare tickets for both the TPM busses and chapas are low, the absence of an integrated fare ticketing system and an efficient network design requires more than 60% of travellers to make multiple transfers, thus paying multiple times for a single commuting journey. As a result, unaffordability of public transport, including both formal and paratransit, constitutes a major barrier in accessing the mobility system, especially given the large average size of households and their composition. Additionally, distance to transport stops, long wait times, limited safety at transport facilities, and disorganized schedules of operation in general hinder the access of people, particularly women and those in vulnerable situations, to transport system, leading to serious consequences on these social groups' livelihood.

Access to car ownership is very limited (44 vehicles per 1,000 people) due to inhabitants' limited socio-economic capacity. Expected GDP growth is anticipated to have significant implications on Mobility patterns, mainly on car ridership (anticipated to increase almost 1.5 folds by 2035), especially if such economic growth is not met with proper upgrading and improvement in urban mobility system. Notwithstanding the current low car ownership rates, a lack of strict rules and laws for proper car parking in the city already makes walking very uncomfortable due to the occupation of sidewalks and public spaces by cars.

## Inter-regional Mobility

Due to the limited availability of data on Inter-regional/International Mobility, it is difficult to formulate a clear picture on the coverage of relevant infrastructure and their capacity in meeting the current and forecasted demand. Therefore, this assessment is based mainly on documentary analysis.

As mentioned previously, Maputo Corridor offers the city a high level of connectivity with neighbouring regions inside Mozambique but also with neighbouring countries. The main modes available for inter-regional or international transportation are inter-city busses, airplanes through Maputo International airport, and inter-city railways with only one train station – Maputo Central station. Additionally, the Port of Maputo serves as a hub for water transport. Nonetheless, available information suggests that movement along these active routes and facilities are primarily limited to goods and logistic purposes, while passenger movement is low. This is mainly attributed to the limited socio-economic capacity of city's inhabitants in accessing these services and for long distance travelling in general.



## Key Findings

- Urban mobility behaviour and patterns in Maputo are shaped by multiple factors including, but not limited to, the city's overall spatial organization, the low capacity of the existing transportation modes in meeting demand, and the limited socio-economic capability of people to access mobility services.
- In addition, factors such as informal economic activities and inadequate educational facilities (the majority of schools therefore have two to three schooling shifts) generate more commuting peak hours per day (three to four peak hours a day), thus exacerbating traffic congestion levels and extending the daily congestion periods.
- High dependency on walking, as a sustainable mode of transport, should be considered a desirable trend in Maputo. The tendency for walking, however, seems to be an outcome of the lack of options, inefficiency of the current urban mobility system, and limited socio-economic capacities, rather than a voluntarily behaviour. It is observed that in some areas of the city, students spend almost an hour, daily, walking to school.
- While plans conducive to improving the walkability of the city should be promoted, including an integrated, broad pedestrian network that is safe, comfortable, accessible for people with reduced mobility, and supplemented by better land use planning and strategies that offer inhabitants more diversity of transportation options is highly needed.
- Data show that unclear normative and institutional frameworks and structures are limiting the capacity of public urban transport in meeting demand, making monitoring the service and infrastructure maintenance difficult.
- The financial deficit of relevant public entities financing TPM and the under-development of the BRT system limits the service's expansion and efficacy, increasing reliance on paratransit modes, of which transportation authorities do not yet have a clear strategy for regulating and/or effectively transforming into a more eco-friendly, sustainable transport system. Strategies for integrating the current broad network of paratransit into a broader public transport system, through which improved physical as well as socio-economic accessibility, particularly of women and people in vulnerable situations, could be attained, is highly needed in Maputo.
- Land use patterns, an absence of an effective central control system for coordinating traffic flow in Maputo, a lack of efficient public transport with adequate coverage, and the poor quality of mobility infrastructure are all causes for the significant traffic congestion in Maputo.
- Given the strategies and plans to be implemented through the Greater Maputo Urban Transport Master Plan developed by JICA, the poly-centric urban form connected by transit corridors could significantly lessen the intensity of daily congestion and decrease the impacts of environmental externalities of the mobility system.
- Improvement of spatial data and mapping is necessary for more thorough assessment of both urban mobility and inter-regional mobility, particularly the spatial distribution of population in relation to transport facilities and routes.

## Municipal Public Services

The Municipal Public Services Element is comprised of 12 components grouped under 4 thematic areas. It analyses information related to Obligations in Municipal Taxes, Civil Registrations, and Cemeteries and Crematoriums; Culture in Cultural Heritage and Activities; Security in Public Lighting and throughout the 4 components of Criminal Justice and Law Enforcement; and in relation to Safety in Emergency and Rescue Services, Food Inspection and Monitoring Institutions, Communicable Diseases, and Surveillance and Response System.

### Key Contextual Information

The Maputo Municipality is in charge of some of the Public Services of this section, including Obligations in Cemeteries and Crematoriums and Municipal Taxes, some aspects of Safety in Public Lighting, and in Culture within Cultural Heritage and Activities. All other components are managed at the National level.

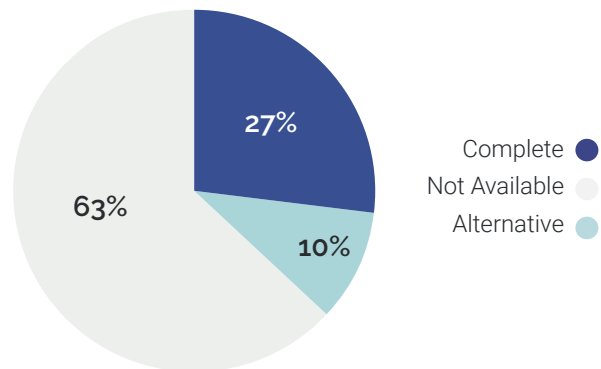
Regarding Municipal Taxes and Finances, Maputo Municipality covers half of its current expenses through local revenue sources. Transfers from the central government make up approximately 20% of the total municipal budget. Furthermore, data suggest that the local government does not generate sufficient resources to cover its minimal operational costs, thus having structural dependence on other sources of funding, such as private sector donations.

Regarding Culture, Maputo has several important monuments that support the understanding of the history of not only the city but of the entire country. Although many of these heritage sites are in bad condition, the city exhibits interesting examples of Portuguese modernist architecture, which flourished in the 60s and 70s of the last century.

### Data Collection Assessment

Given the high diversity of topics addressed in this Urban Element, there are important discrepancies between the amount of available data per components. Most of the data were gathered and compiled during technical workshops that not all Municipal Public Services' Stakeholders were able to attend, resulting in the total percentage of data considered Not Available totalling 63%.

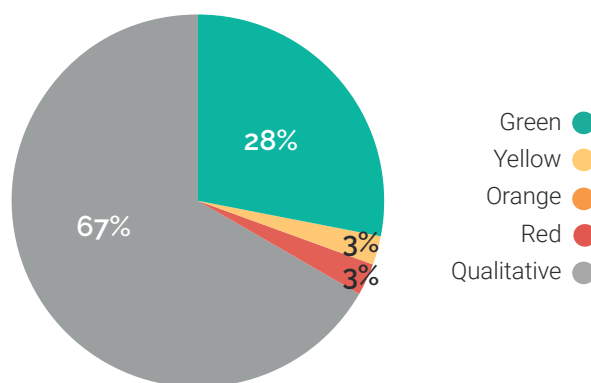
The 27% of the data considered Complete and the 10% considered Alternative primarily pertains to components for which the Maputo Municipality is officially in charge of providing services (Cemeteries & crematoriums, Cultural Heritage and Activities and Municipal Taxes), with the exception of Public Lighting. Further investigation would be needed to obtain a clearer and more accurate picture of the element.



**Figure 9:** Data Collection Assessment (Municipal Public Services). Source: CRPP (2019).

## Benchmark Assessment

As shown in the chart above, given the limitations in data collection, an accurate overall measurement of the way Maputo performs in regard to Municipal Public Services remains a challenge. The 67% of 'qualitative' data reflects information applied to the assessment that is specific to the context of the Municipality, but which cannot be benchmarked. The 28% 'green' is identifying sporadic good practices in several of the components.



**Figure 10:** Benchmark Assessment (Municipal Public Services). Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
5.1.3.2	Do mechanisms exist to support people who cannot afford burial or cremation services?	Yes	Green
5.2.3.1	Proportion of children under 5 years of age whose births have been registered with a civil authority.	55%	Red
5.4.4.1	Public expenditure per capita spent on all cultural heritage (tangible, intangible and natural)	Not Available	-
5.3.2.1.1	Law enforcement entities operating in the city, with respective capacities	Not Available	-
5.3.3.1.2	Capacity and occupancy rate of detention centres.	Not Available	-
5.3.4.2.1	Free of charge legal aid availability in the city, including types of legal aid.	Yes	Green
5.5.2.4	Existence of a public management body that is responsible for inter-agency preparedness and response coordination	Not Available	-
5.7.3.1	Existence of early warning and response systems in case of communicable disease outbreak	Yes, to both general public and specialised institutions	Green

## Obligations

### Cemeteries and Crematoriums

There are 10 burial sites (cemeteries) located in the city of Maputo, although with few spaces available for additional burials. According to the Municipal Development Plan (2006-17), the City Council has opened a new cemetery in Michafutene / Marracuene area, which has operated since December 2014. The reuse of graves is legal, with 1,284 graves relocated in the past year. Data indicates that records are kept on burials and cremations, regulations and protocols are followed, and while there is some monitoring, there is a lack of enforcement for non-compliance.

The City has one public crematorium that is adequate to meet existing demand: over the last years, only 5% of deceased people were cremated. The Municipality is planning for further development of the burial and crematory infrastructure although spatial availability and financial costs is delaying this expansion. Any potential development of a new crematorium should allow for better management of space in the cemeteries. Thanks to support mechanisms, these services are accessible to people that cannot afford burials and or cremations.

### Civil Registration

Civil registration is processed at the national level, through the Direção Nacional de Registo e Notariado as the responsible department for all major life events. Coverage of civil registration services is maintained through 4 district offices, which are able to cover the entire population.

The proportion of children under 5 years of age whose births have been registered with a civil authority is quite low (55%). Further investigation would be necessary to understand the barriers to the population and perhaps provide adequate support, as birth registration is free of charge up to 120 days.

Data storage and management seem to be automatised by the civil registration office, which produces a monthly report shared with national, regional and local governments. It is unknown if the Municipality is using this data for planning at the urban level as a tool for better understanding population dynamics.

### Municipal Taxes

The Municipality is responsible for levying a broad range of taxes, including on income, specific transactions (e.g. fuel, alcohol, tobacco, hotel reservations, vehicles registration) and land transfers. In spite of this, the analysis shows room for improvement in the collection and availability of data related to municipal finances, as well as in overall fiscal management processes.

Access to municipal tax services by the general population is facilitated through the provision of online tax services, a taxpayer assistance centre, and decentralised municipal tax services at the district or neighbourhood level, all accessible by public transportation. However, there is no assistance in place for specific vulnerable groups.

## Culture

### Cultural Heritage and Activities

Maputo is a culturally vibrant city with a diversity of cultural heritages and activities like public events presenting traditional rituals, customs and festivities of different cultures. Portions of the urban fabric are of significance like the Cidade de Cimento and the Cidade de Caniço. However, most of the few cultural facilities available are not widespread, thus limiting the adequate spatial coverage of the city.

Regarding the population, there is a lack of access to cultural facilities probably related to financial limitations, mobility aspects linked to spatial distributions, social barriers, and lack of awareness and dissemination of information. The data suggests that some ethnic minorities in the City may not have the right to enjoy their culture, practice their religion, and/or use their own language in public, but further research would be necessary to clarify and better understand the reasons for this limitation.

Further research would also be required regarding the management of cultural heritage and cultural facilities by the Municipality and the expenditures associated with them. While some measures have already been identified such as occasional support programmes for institutions, organisations or groups to organise cultural activities and support operation and maintenance costs, many culturally significant buildings lack adequate conservation efforts.

## Security

### Criminal Justice and Law Institutions

There is insufficient data to fully appraise the exact extent of violence and insecurity in Maputo in comparison to national averages, although complementary research highlights the high prevalence of property and violent crimes in some parts of the city. A comprehensive qualitative and quantitative investigation might be fruitful in order to assess both crime patterns and prevention strategies, as well as in evaluating high-risk urban areas in relation to vulnerable groups.

In regard to Justice, everything is processed at national level, with no municipal court to deal with specific city issues such as administrative ones. Access to Justice is supported for those not speaking the official language or not able to pay for the service. Moreover, as emerged during consultations with the Ministry of Justice, the number of public officials working on crime is reportedly inadequate and increased coordination between local and central governments is required in order to improve both prevention and monitoring.

No data was provided regarding the components of Law Enforcement and Detention Facilities, which, if made available, would deepen the analysis of security in the city.

### Public Lighting

There is no information available on public lighting, another important layer of the analysis of security in the city. Additional qualitative research suggests that public lighting is mainly provided on primary streets, certain secondary streets, and in a few public spaces, with the service managed by the local government and delivered by EDM (Energia de Moçambique), a private enterprise. Improvements in the public lighting system in Maputo should be considered in the peripheral neighbourhoods which is currently not sufficiently covered.

## Safety

Regarding the three components linked to Safety and Emergency, insufficient data and information were collected to be able to evaluate this thematic area adequately. Further research would also be relevant in order to draw linkages to identified Risk Reduction Measures, in particular those related to biological shocks.

### Emergency and Rescue Services

Emergency and Rescue Services in Maputo are provided by SENSAP (Serviço Nacional de Salvação Pública), a national agency responsible for 24/7 fire prevention. SENSAP is supported by voluntary fire brigades and reachable through a free hotline at any time. SENSAP is also responsible for coordinating other types of emergency interventions, such as tactical services, public security, maritime units, and hazardous devices services, jointly with INAMAR (Serviço Nacional de Administração e Fiscalização Marítima). Moreover, there are other public and private entities involved in managing emergency, such as the CENOE – specialised in Search and Rescue activities in natural disaster –; IACM, which is responsible for managing aviation units; and the Ministry of Interior, which is responsible for canine units. Overall, the majority of these public entities exhibit a general lack of capacity in terms of both human resources and equipment.

In this respect, during the technical workshop, it was reported by SENSAP that they possess insufficient means to combat fires and provide rescue. Such deficiency stems from a lack of materials and human resources and results in several performance inefficiencies. Emergency response time appears to be inadequate in most cases, due to a combination of uneven distribution of fire brigades throughout the city, anarchic occupancy of public spaces, and the existence of neighbourhoods with narrow streets inaccessible to firefighters' vehicles. Lastly, it appears that there is some confusion and lack of clarity amongst key stakeholders regarding emergency response when an event occurs related to who should be in charge and act in certain capacities.

## Food inspection and Monitoring Institutions

The Inspeção Nacional das Actividades Económicas (INAE) seems to be the only entity in charge of this activity. No further information was collected.

## Communicable Diseases Surveillance and Response System

Limited data were provided for this component, impeding its proper analysis. There is an early warning and response system in place utilising radio, television and newspaper, in case of a communicable disease outbreak. Data collection was complemented by additional research and consultations with local experts, which highlighted cholera, malaria and HIV as key public health issues in Maputo.

## Key Findings

- **Obligations:**
  - Data collection completion on cemeteries and crematorium exceeded 80%. Alternative possibilities to expanding cemeteries should be considered and promoted such as the re-use of graves and increased cremation rates.
  - Civil registration is managed at the national level. Low birth registration rates need to be investigated to understand what barriers exist to registration and what can be acted upon from the local level.
  - Regarding municipal taxes, more information and data should be gathered in order to improve local fiscal management.
- **Culture:** There is a diversity of cultural heritage and activities, but coverage is insufficient and spatially uneven. Further research should be conducted to better understand management at the municipal level, including allocation of resources. Events and activities should be better promoted to all, including women and groups in vulnerable situations, through awareness-campaigns and improved dissemination of information.
- **Security:** High levels of insecurity and crime exist in the city, although the available information is not sufficient to properly assess the full impacts of insecurity and crime and the response provided in terms of law enforcement and detention facilities. Improving public lighting systems would be necessary to increase security.
- **Safety:** Not enough data and information were provided on these components, although it is important to highlight Malaria, Cholera and HIV as key public health issues. Regarding emergency response, there is a lack of clarity about who should be in charge and act in case of an event.
- There is an overall need to obtain more data and information to better assess the entire performance of the Municipal Public Services Element, especially regarding Safety and Security.

## Social Inclusion and Protection

The Social Inclusion and Protection Element (SIP) is comprised of three macro-components, gathering data on Social Accountability, Social Protection Floors, and Basic Social Services – such as education, health, social care and food provision. The section is designed to assess the availability of the aforementioned services in the city, mapping accessibility barriers that different population groups may face.

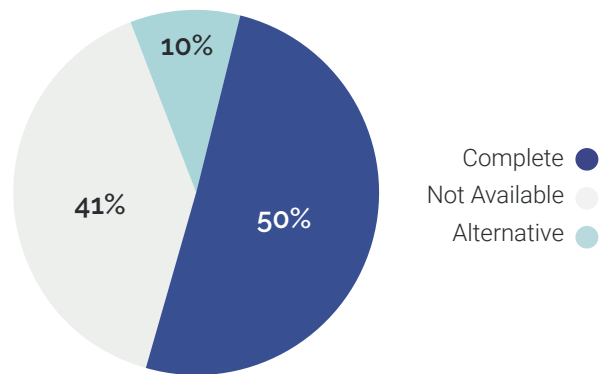
### Key Contextual Information

The analysis of how SIP services are delivered in a city cannot be separated from the level of decentralisation present in the country, hence from the mapping of how competencies, responsibilities and resources are organised at different levels of governance. While these aspects will be further unpacked in other sections of this report, some key caveats are required here in order to frame both the data collection and benchmark assessments that follow. On a very general note, competencies related to public health and education pertains to Mozambique's central government, while social inclusion and protection programmes are managed at the municipal scale – with support from third sector organisations.

### Data Collection Assessment

The element exhibits a relatively low level of data availability, with 41% of questions deemed Not Available. On the other hand, 50% of available indicators were completed according to CRPT criteria of adequacy, whereas 10% were answered through Alternative data. This dynamic is particularly the case of more complex indicators - requiring the combination of different datasets – for which partial data was collected, yet not enough to propose a quantitative scoring.

Except in the case of Social Accountability - featuring a full completion rate - education, health and food services feature a 75% data availability on average; whereas significant data gaps and barriers can be recorded for Social Protection Floor or Basic Social Care.

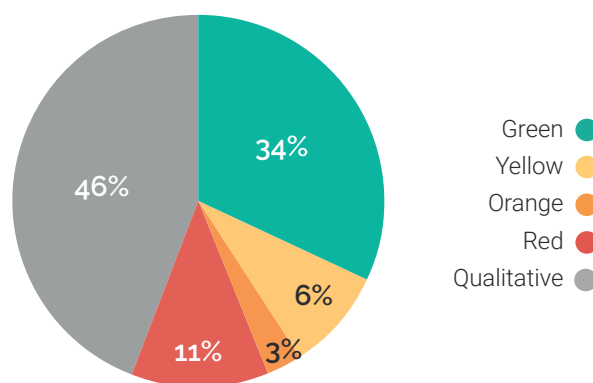


**Figure 11:** Data Collection Assessment (Social Inclusion and Protection). Source: CRPP (2019).



## Benchmark Assessment

Maputo SIP Element features a significantly higher level of capacities than vulnerabilities, as illustrated in the chart above. This should be weighed, however, against an average of only four benchmark-able questions per sub-component, excluding Basic Social Care (for which no Complete data was available). Therefore, the assessment that follows had to inevitably be complemented with a relatively broad range of 'qualitative' data, mainly extracted from technical workshops held with public officials or from partially completed quantitative indicators.



**Figure 12:** Benchmark Assessment (Social Inclusion and Protection). Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
6.1.1.1	Does the local government consult citizens regarding its development interventions?	Yes	Green
6.1.2.1	Are there currently citizens' initiatives under way?	No	Red
6.1.3.1	Does the local government include CSOs in decision making processes?	Partially	Yellow
6.1.4.1	Does the local government collect citizens' feedback?	No	Red
6.2.2.3	Access to vaccination and immunization programmes	Yes, free of charge	Green
6.2.2.4	Access to antiretroviral treatments and hepatitis C treatments	Yes, free of charge	Green
6.3.1.2.5	Do disabled students have access to school?	Partially	Yellow
6.3.4.1.1	Existence of malnutrition in the city	Yes	Red

## Social Accountability

The component features a higher degree of capacities than vulnerabilities as well as a 100% data completion rate. Mechanisms of civil society consultation from the Local Government's side address a diverse range of new development issues, particularly utilities infrastructure, basic social services, land, housing and ecology-related projects. Although these communication channels work for a consultative scope – to include inputs in planned interventions – no mechanism to incorporate citizens' feedback has been detected. On the other hand, the Municipality possesses an existing array of grievance redress mechanisms open to different vulnerable groups, such as children without parental care, dependent elderly and disabled people, as well as communities forced to involuntarily resettle. To conclude, while the local government currently involves three civil society organisations in decision-making – though without voting power – no citizens' initiative has been detected. At the time of writing, the Municipality has reportedly not launched any initiative to facilitate such forms of bottom-up organisation.

## Social Protection Floor

The component exhibits a very limited availability of data (32%), including both Complete and of Alternative data. On the one hand, this mirrors the overall absence of social protection measures at the country-scale (i.e. means-tested unemployment benefits, universal child allowance, social benefits for poor people or nutrition-related programmes among others). On the other hand, it reflects a generalised lack of locally disaggregated and up-to-date information on socio-economic or poverty indicators. With this in mind, positive capacities to be highlighted refer to the existence and accessibility of family planning services, vaccination and immunization programmes, and anti-retroviral treatments, although access/coverage related figures seem hard to identify.

## Basic Social Services

The overall positive performance of this component is mitigated by a significantly low data availability in the Social Care section, where no Complete indicators are recorded. That being said, both Education and Health feature a higher level of information, allowing for a more comprehensive assessment of the performance. With regard to health and education, both management and maintenance services are the responsibility of the respective ministries. The Municipality should request the transfer of competence, as established in Decree 33/2006.

## Education

As of 2015, Maputo exhibited almost full enrolment in primary education and 83% enrolment rate in secondary education facilities – rates are slightly higher among male than female students. This positions the city in a comparatively positive performance, with respect to its wider national context. According to the Urban Master Plan of Maputo Municipality (PEUMM), Maputo Municipality manages, together with the Ministry of Education, approximately 270 schools, including primary and secondary education. Maputo City Council has recently signed an agreement that would transfer the management of 105 primary schools (65% of which are public) to the local government, which will be responsible for maintaining these facilities. According to Maputo's Provincial Directory for Education, the capacity of secondary schools appears to meet local demand, while capacity is reportedly less adequate with regard to primary education facilities, resulting in partial overcrowding. Moreover, the city's schools are currently running three shifts per day, often with overcrowded classrooms, and triggering an indirect impact on traffic congestion three times a day. Furthermore, according to data collected, the majority of these facilities are in degraded condition, with intermittent access to electricity and water, as well as limited accessibility for disabled students.

## Health

As reported through technical workshops with local public officials, the capacity of basic health services is considered below adequate levels due primarily to financial barriers, resulting into long response times, particularly in emergency situations. On the other hand, free vaccination and immunization programs operate at the national level and are available to all population groups. Also, there are protocols in place to monitor, tackle, and treat diseases like malaria and HIV/AIDS, as well as abuse of alcohol and drugs.

## Social Care

Information on social care services is almost entirely absent, both in terms of vulnerable groups in the city and coverage of protective/preventive measures.

## Food

Along with poverty and households' limited purchasing power, main drivers of malnutrition in the city are high rates of exposure to malaria – 40% of the population carries the parasite at the national level - as well as regular breakdowns in food supply chains due to drought events affecting the Maputo region. According to 2011 figures, 23% of the population and 2% of children in Maputo suffered from chronic and acute undernourishment, respectively. Several nutrition-related programmes targeting children operate at the national scale – as of 2018 - covering an estimated 37% of those in need. It was, however, not possible to assess what portion of this target group reside in the Maputo area.

## Key Findings

- As illustrated through the assessment, the possibility of extracting evidence-based analyses is significantly curtailed by a widespread lack of information about this Urban Element, with the exception of the Social Accountability Component.
- In regard to the Social Accountability Component, the city exhibits full data availability and good capacity overall, although limited engagement of civil society organisations and local communities were detected throughout the process; particularly for those living in informal settlements, with insecurity of tenure and limited access to basic services.
- In terms of education, while Maputo performs better than wider Mozambique on main quantitative indicators – such as enrolment and drop-out rate -, schooling facilities are reportedly inadequate in terms of both personnel and space capacity, often resulting in overcrowded classrooms. Major concerns were also raised regarding structural adequacy, maintenance and accessibility for disabled people.
- Maputo's public health facilities are put under severe strain due to the proliferation of malaria, which features also as a major driver of malnutrition in the city, as is the case nationwide.
- The general lack of information on both Social Protection Floors and Basic Social Services reflects a weak performance of the city on this area, also due to the absence of similar measures at the country level.
- To conclude, the Local Government could benefit from further investigation and data generation processes regarding key socio-economic indicators – i.e. disaggregated poverty and unemployment data – in order to inform future policy actions in the social protection field.

# Economy

The Economy Element is comprised of three components and analyses information related to Economic Composition, Municipal Finance and Available Fiscal Mechanisms, and the degree to which the local economy is interconnected and connected to other markets.

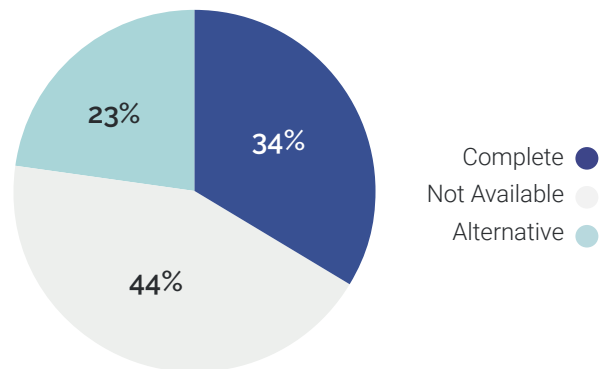
## Key Contextual Information

Maputo is the economic and administrative centre of Mozambique. As the nation's capital, the urban area contains a large proportion of the country's governmental activities, resulting in a significant number of jobs in healthcare, education, public administration, and other related sectors. In addition, the city has experienced tremendous growth over the past two decades, often characterized as one of the fastest growing economies in the world by GDP. Such growth has resulted in increased investment (both foreign and domestic capital) and the development of robust export industries for certain raw materials and intermediate goods, cementing itself as a key economic hub in the region. However, much of the City's rapid growth has been captured through informal activity, as the formal economy has neither the capacity nor economic infrastructure in place to absorb current demand. The results of these trends include persistent inequality, high levels of poverty, and reliance on high-value imports from international markets.

## Data Collection Assessment

Data collection for the Economy Element in Maputo for has been challenging, resulting in only 34% Complete and 23% Alternative (in total 57%). Of the three components comprising the Economy Element, data collection completion is far higher for both the Market Connectivity Component (58%) and Fiscal Stability and Municipal Finance (62%) than the Local Economic Structure Component (40%). For Local Economic Structure, analytical efforts are extremely limited due to the little amount of data available. However, a far more robust analysis could be conducted if current municipal budgets were made available and local and/or metropolitan industry and business data could be assessed.

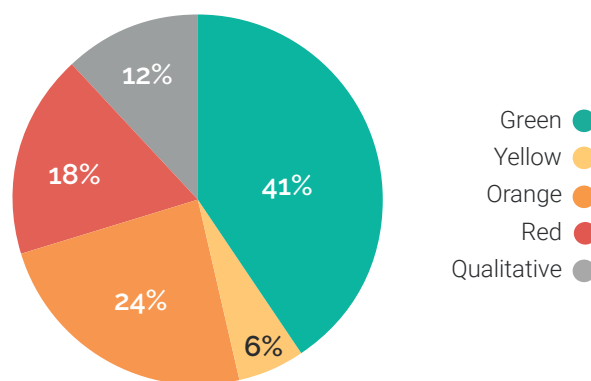
Furthermore, in addition to limitations in the sheer volume of data available, there exist significant limitations in gathering reliable economic data for Maputo as well. A large proportion of higher quality data is limited to the national level and sources providing data for many of the questions asking for greater detail or more specific information (i.e. business or industry information) have not been identified.



**Figure 13:** Data Collection Assessment (Economy).  
Source: CRPP (2019).

## Benchmark Assessment

The benchmarking analysis indicates that over half of the questions that possess benchmarks do not have sufficient data (44% Not Available). Such levels of completion greatly hinder any more holistic analysis and potential findings. However, based on the data available, of the supporting indicators that do have sufficient data, capacities (data found to perform at a 'green' or 'yellow' level) comprise a slightly larger share of the measurable data (47%) compared to vulnerabilities (supporting indicators found to be 'red' or 'orange'), which totals 42%. Across components, we find that Fiscal Stability and Municipal Finance includes the best performing composition of measurable data, while Local Economic Structure and Market Connectivity both demonstrate more vulnerability in the datasets available.



**Figure 14:** Benchmark Assessment (Economy).  
Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
7.1.3.3	Informal employment rate	51.7%	Red
7.1.3.4	Youth unemployment rate	39.7%	Red
7.2.1.2	Revenue variability over time (10 years)	10%	Yellow
7.2.2.3	Percentage of inhabitants paying land/property tax	Not Available	-
7.2.3.2	Percentage of total expenditures that are discretionary or fixed for each Local Government Division.	83%	Green
7.3.2.3	Currency volatility over the past decade	15%	Green

## Local Economic Structure

This component features key vulnerabilities related to employment. Overall unemployment levels (28.6%), Informal employment (52%) and youth unemployment (39.7%) levels indicate a local economy unable to absorb the growing labour market into the formal economy, particularly young people. Similarly, these data suggest an enormous resource of labour that is not being effectively leveraged. Moreover, as data indicate the presence of worker training programs in the city, there exist pre-existing commitments to better matching worker skills with market demands and thus address in part challenges related to employment.

## Fiscal Stability and Municipal Finance

The largest concentration of capacities ('green' and 'yellow' benchmarks) are found in the Fiscal Stability and Municipal Finance Component and relate to municipal revenue diversity (0.21), variability (10%), own-source revenue (59%), and discretionary spending (83%). These key capacities suggest the City possesses the operational autonomy and revenue flexibility and stability to invest in policy priorities over the medium and long-term. Aside from relatively low overall municipal revenues per capita in Maputo, an identified vulnerability that may hinder such policy efforts includes high levels of national debt as annual debt payments increase, national transfers to the city budget may be reduced over time.

## Market Connectivity

The third Economy Component features vulnerabilities related to the national business environment, the existence of civil and/or industrial unrest over the past 10 years, and the limited number of medium-to-large cities within close proximity (Pretoria is located approximately 518 km from Maputo). Identified vulnerabilities suggest that despite the rapid growth of Maputo, both in terms of population and production, there is reason for investors to be cautious given the relative risks present in the economic environment. Capacities include an existing robust international trade network and a stable national currency, which should encourage longer-term investment. In addition, the availability of formal banking institutions provides a structural framework for business development at the local level.

## Key Findings

- Based on the data available, it is clear that level of unemployment (29%), scale of the informal economy (e.g. proportion of informal employment is 52%) and the proportion of unemployed youth (40%) demonstrate the lack of economic opportunities provided by the formal economic system in Maputo. To better understand these complex and interconnected stresses, an effort to collect more detailed, local economic data should be pursued.
- The availability of formal banking institutions provides a structural framework for business development at the local level. Capacities that should be assessed further for how they could be potentially leveraged include the availability of commercial banks, a relatively stable currency, and a diverse import/export composition.
- While Maputo has cemented itself as an international trade hub in the region, the geographic distribution of commercial centres in the region limits the potential for economic clustering and more robust trading networks at the inter-continental and domestic levels. Given there is only a single large city located within close proximity to Maputo, development strategies should likely focus more on international exports and circular economic initiatives.
- While income inequality measures for Maputo City are not available, national figures indicating high levels inequality throughout Mozambique suggest the city faces a similar stress, one which will likely continue in the city going forward given current growth rates and high levels of unemployment.
- Issues pertaining to data availability limits the potential benefits of conducting this analysis. The main data source for economic data remains the national statistical offices, which generally produce statistics for only the national and regional levels. Economic statistical efforts covering municipal levels are restricted primarily to census surveys that take place every 10 years. Efforts to develop effective and consistent data collection processes in the city will provide a better capacity to make informed decisions, track policy effects, and justify new initiatives.
- Despite relatively stable fiscal revenue streams year over year, along with autonomy in how expenditures are prioritized, the data suggest limited land tax coverage and associated revenue generation, which hinder the scope and scale of potential policy initiatives. The analysis also suggests that municipal revenue for property taxation could significantly increase if Maputo Municipality improved tax compliance and/or increased rates where prudent.

## Ecology

The Ecology Element adopts the ecosystem services approach to assess how the city and its surrounding region interact with and impact its ecosystems – essential in providing resources for consumption, regulating the environment, and serving cultural and recreational purposes –, and by further analysing its ecological footprint, its biodiversity and green infrastructure, and its environmental quality.

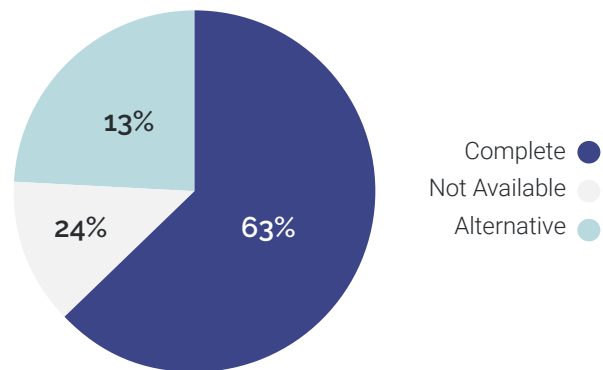
### Key Contextual Information

Maputo's location by a large natural bay and the Estuario do Espírito, where four rivers drain, means that it is predominated by water/wetland (intertidal areas, estuaries and mangroves, sandy beaches, riparian vegetation and water bodies) as well as terrestrial habitats (dune systems, and bushes and shrublands). The Municipality has established an ecological system or a series of ecologically sensitive areas that aim to improving the functionality of ecosystems in regard to the urban area (e.g. to regulate atmospheric flows and water runoff, secure biological systems, etc.). Other ecological areas relevant to Maputo include the Reserva Marinha Parcial da Ponta do Ouro (Ponta do Ouro Partial Marine Reserve), Reservas Florestais do Arquipélago de Inhaca (Archipelago of Inhaca Forest Reserve), and Área de Conservação Transfronteira dos Libombos (Libombos Transboundary Conservation Area).

### Data Collection Assessment

Data collection for the Ecology Element has resulted in 63% Complete and an additional 13% of Alternative data, while 24% of data was Not Available. In some cases, where data is Not Available, Alternative data and documentary analysis have been employed to supplement the needed information.

Much of the data for ecosystem services and biodiversity and green infrastructure were derived from the document Serviço de consultoria para a identificação, Zoneamento das áreas Ecologicamente Sensíveis do Município de Maputo (Consulting services for the identification, Zoning of Ecologically Sensitive Areas of the Municipality of Maputo), published in 2013. Apart from this, the Urban Master Plan of Maputo Municipality (PEUMM), was used for areas within the urban footprint of Maputo. Through the spatial information present in these documents, completion of spatial indicators was attempted by the CRPP team through spatial analysis; however, it must be noted that this is a preliminary effort and more thorough analysis should be carried out.

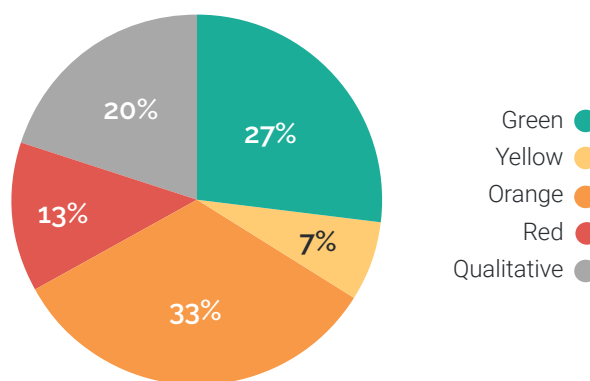


**Figure 15:** Data Collection Assessment (Ecology).  
Source: CRPP (2019).



## Benchmark Assessment

Based on the measurable data available, with a high reliance on 'qualitative' assessment, the way Maputo interacts with and impacts its ecosystem shows considerable vulnerabilities. There are multiple points of concern regarding the level of preservation and quality of its ecosystems and environment. However, marked capacities appear in the existence of frameworks and policies that support proper implementation.



**Figure 16:** Benchmark Assessment (Ecology).

Source: CRPP (2019).

Highlighted Indicators			
No.	Supporting Indicator	Data	Benchmark
8.1.2.3	Does the local government take the ecosystem services approach or a different environmental approach into consideration in local policy and planning?	Yes	Green
8.3.1.3	Proportion of natural areas and urban green spaces in the city as a percentage of the urban area	18.74%	Green
8.3.1.4	Urban green space per capita	10.6	Orange
8.4.2.1	Particulate matter (PM10) concentration (24-hour average)	200 (µg/m <sup>3</sup> )	Red
8.4.3.3	Pollutants present in Marine Class I Water that have transgressed the established limit	2 out of 6 tests comply with required limits	Red
8.4.3.4	Pollutants present in Marine Class I Water that have transgressed the established limit	3 out of 5 tests comply with required limits	Orange
8.4.5.2	Existence, monitoring and enforcement of air quality regulations	Approved regulations, limited monitoring, limited enforcement	Orange

## Ecosystem Services

Human settlements depend on ecosystems to obtain services for them to function and thrive. These include provision of resources, regulation of the environment, and cultural purposes. In the case of Maputo, there is a lack of systemic information on its varying ecosystems, preventing an accurate view of changes and trends in the ecosystem services in the past years. Nevertheless, a decreasing level of preservation has been reported in many areas in and around Maputo, such as in the northern coastal plain where the construction of settlements has degraded the mangroves, marshes and dunes over the past 20 years. However, there are policies and plans currently existing that recognise the varying types of ecosystem services and are geared towards preservation.

## Ecological Footprint

Ecological footprint provides an overview on the consumption and production patterns of people, represented by the amount of land required to meet demand (global hectares). However, there is currently no city-specific study for the ecological footprint of Maputo. National-scale data for Mozambique exists with a low ecological footprint per capita (0.87) and a stable trend over the past 10 years, but it cannot be assumed as representative of Maputo considering the low urban population of Mozambique.

## Biodiversity and Green Infrastructure

While there is limited updated and comprehensive information on biodiversity in Maputo at the local level, according to the Zoneamento Ecologico de Maputo (Maputo Ecological Zoning), the intensity of human and economic action within the urban limits of Maputo is such that natural vegetation has been practically decimated. There is a relatively high percentage of natural areas in what is considered Maputo's boundaries, but most of these areas are located in the island of Catembe, and in the eastern coastal zone, while the centre of Maputo itself is characterised by urbanised areas with an almost total absence of green areas and a low proportion of green space per capita. Natural protected areas can also be found in the surrounding regions, but there is a low level of connectivity from these and the peripheral natural areas to the central city area itself through corridors that can encourage biodiversity. Furthermore, these ecologically sensitive areas are constantly under pressure due to the ongoing urbanisation of Maputo, with many areas already having settlements located therein.

## Environmental Quality

The concentration of pollutants in the air (e.g. PM10 200-1200  $\mu\text{g}/\text{m}^3$ ) indicates that Maputo fluctuates between moderately and severely polluted. Water quality is also very poor, since groundwater, freshwater and marine water have shown significant contaminations of oil, nitrates, faecal coliforms, and E. coli, among others. These pollutants have been linked to the presence of ports, poor treatment of wastewater, and agrochemical runoff. The city also experiences other forms of pollution such as land pollution, due to poor disposal of human and solid wastes or, specifically in Paiol de Malhazine, due to chemical substances. Due to sources such as road traffic, the presence of the airport and nightlife, many districts in Maputo are also affected by noise pollution. While there does exist a framework in Maputo to address this myriad of problems, actual monitoring and enforcement are limited and carried out on an ad hoc basis. Similarly, while there is a joint project attempting to collect CO<sub>2</sub> levels with a partner university, testing was performed outside the country and systemic monitoring is absent at the municipal level.

## Key Findings

- The ongoing expansion of urbanization trends in Maputo is threatening the ecosystems and ecologically sensitive areas that surround the city, increasing exposure of its inhabitants to various risks, such as increasing frequency of flooding and erosion events especially along the coastline due to the loss of vegetation and reduced ground infiltration.
- Maputo experiences high levels and diverse types of pollution caused by a myriad of sources and factors. Furthermore, the Bay of Maputo acts as a receptacle of pollutants from other areas in the surrounding region, including the neighbouring Matola, which hosts most major industries in Mozambique.
- Climate change is expected to exacerbate the degradation of ecologically sensitive areas as well as aggravate the pollution issues of Maputo.
- There are existing frameworks that encourage maintenance of ecosystem services, biodiversity and green areas, and environmental quality. However, it has been noted that many initiatives remain in initial stages and there is still significant improvement necessary in implementation, monitoring and enforcement.
- The lack of systemic monitoring has led to significant data gaps particularly regarding the trends of ecosystem services, biodiversity, and greenhouse gas emissions. Furthermore, while available spatial information is able to capture the demarcated natural and green areas, many of these have already been encroached by settlements, making the spatial indicators less reliable.

# Annex IV





## List of figures

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<b>Figure 1</b>	Wheel of Shocks. Source: CRPP (2018)
<b>Figure 2</b>	Prioritised shocks in Maputo. Source: CRPT (2019)
<b>Figure 3</b>	Heat waves projections in Maputo. Source: "Future climate change, expected impacts and vulnerability in Maputo City by the end of the 21st century".
<b>Figure 4</b>	Areas prone to flooding (blue) overlapped with storm water drainage main critical areas (dashed red). Source: CRPP based on information provided by PEUMM (2008)
<b>Figure 5</b>	The state of data completion on RR Measures. Source: CRPT (2019)

## List of tables

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<b>Table 1</b>	Listing of shocks identified in Maputo and their characterisation. Source: CRPT (2019).
<b>Table 2</b>	Secondary shocks triggered and affected Urban Elements and Components by droughts. Source: CRPT (2019).
<b>Table 3</b>	Secondary shocks triggered and affected Urban Elements and Components by heat waves. Source: CRPT (2019).
<b>Table 4</b>	Secondary shocks triggered and affected Urban Elements and Components by floods. Source: CRPT (2019).
<b>Table 5</b>	Secondary shocks triggered cyclones. Source: CRPT (2019).
<b>Table 6</b>	Secondary shocks triggered and affected Urban Elements and Components by malaria. Source: CRPT (2019).

## List of acronyms and abbreviations

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	Programa de Perfil da Resiliência das Cidades
<b>CRPP</b>	City Resilience Profiling Programme
<b>CRPT</b>	City Resilience Profiling Tool
<b>EWS</b>	Early Warning System
<b>HIV</b>	Human Immunodeficiency Viruses
<b>INGC</b>	National Institute of Disaster Management
<b>NGO</b>	Non-governmental Organisation
<b>PNCM</b>	Ministry of Health through the National Malaria Control Program.
<b>PDRP</b>	Pre-Disaster Recovery Planning
<b>PDRRD</b>	Master Plan for Disaster Risk Reduction
<b>PARPA</b>	Action Plan for Extreme Poverty Reduction
<b>RR</b>	Risk Reduction
<b>SOP</b>	Standard Operation Procedures
<b>UNDRR</b>	United Nations Office for Disaster Risk Reduction
<b>WHO</b>	World Health Organization

# Annex IV

## Shocks Analysis

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This analytical section brings together data and information gathered through the urban context (SET1) and urban performance (SET4), with 'qualitative' data derived from publications, and local and expert knowledge, resulting in a composite mapping of Maputo's proneness to shocks, the stresses affecting its performance, the challenges it's facing, and their interrelations.

The section is separated into subcomponents addressing different types of shocks and adopts a qualitative methodology for evaluating interrelated data, resulting in an identification of the priority shocks in city. These priorities are highlighted and further analysed later on in this section. At the end of the section, a summary of key findings of this analysis is provided.

This analysis contributes to the formulation of a comprehensive diagnosis of the urban system through capturing weaknesses, pressures and contextual changes, thereby creating a foundation for the design of implementable and adaptable actions aimed at decreasing the possible impacts of these threats at the urban scale.

### Shocks

Shocks are defined as uncertain, abrupt or long-onset events, that have the potential to negatively impact the purpose or objectives of an urban system.

Building off of UNISDR's 2017 terminology and taxonomy on hazards, CRPT considers six main groups of shocks, of which four (Natural, Biological, Environmental and Technological/Man-made) are consistent with UNISDR's taxonomy. In addition to these four groups, CRPT's list includes Complex shocks as well as Societal shocks that seek to capture a range of potential socio-economic, socio-spatial, or socio-cultural, to name a few, shocks to which a city may be prone (refer to Appendix 2. List of Shocks, stresses and stressors).

Drawing on the CRPT's shocks taxonomy and using data collected through the urban context, documentary analysis, local knowledge, and interviews with researchers and professional experts, the following section brings together information on the different identified plausible shocks identified as plausible ones in Maputo.



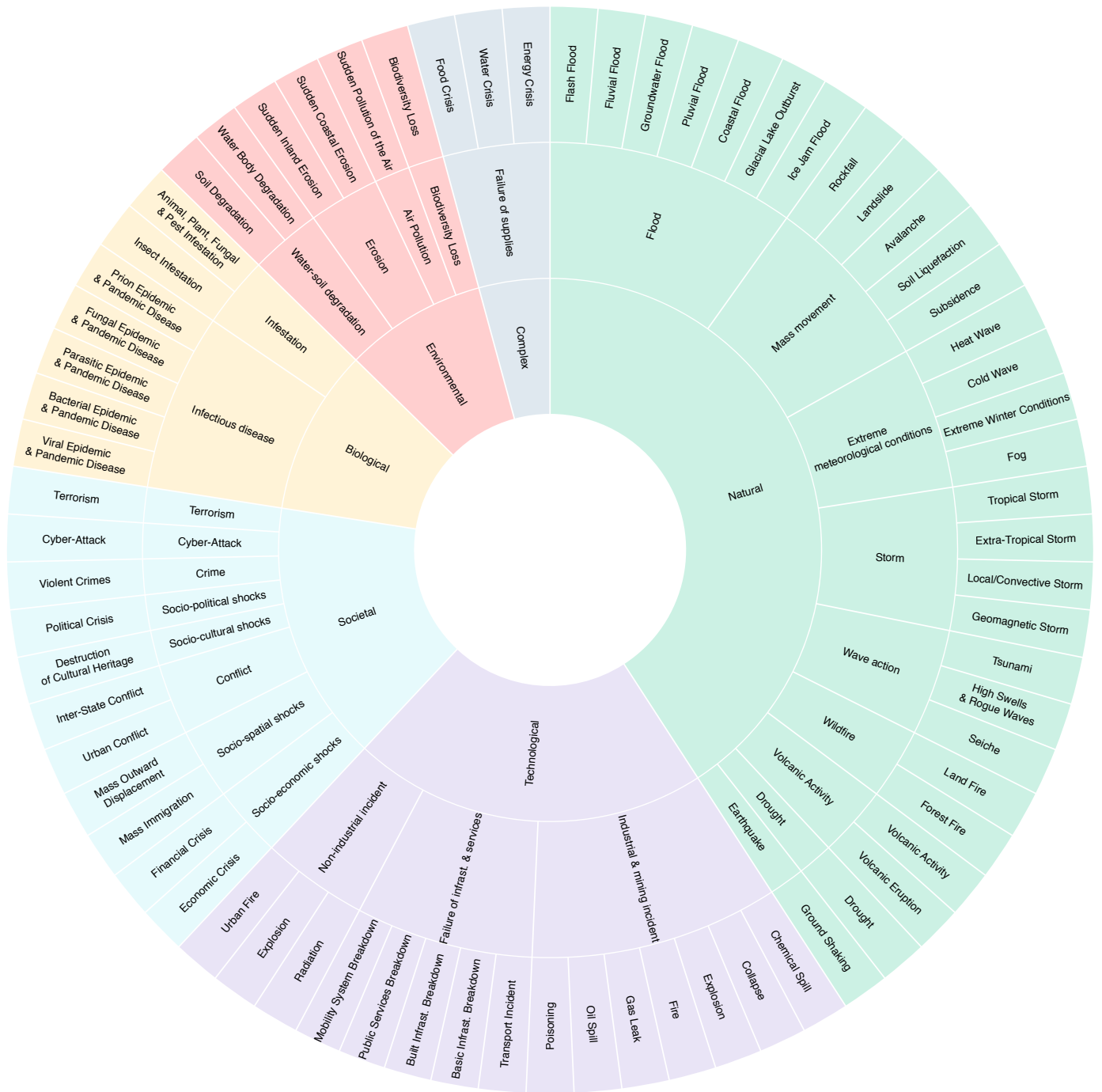


Figure 1: Wheel of Shocks. Source: CRPP (2018).

## Identification of Shocks in Maputo

Maputo has been identified as one of the most risk-prone locations to climate change in Mozambique<sup>1</sup>. This high-risk stems in large part from an increasing frequency of observed events such as droughts, high temperature periods, internal flooding, tropical cyclones and malaria outbreak<sup>2</sup>.

Furthermore, projections show that climate change may induce higher average temperatures, higher sea levels, catastrophic changes in precipitation patterns as well as affect the frequency and intensity of extreme events such as tropical cyclones, floods and droughts. The indirect consequences of climate-related threats in Maputo Municipality include the destruction of services and infrastructure such as roads, drainage, sewage, water and electricity systems, public spaces, and public and private buildings.

Moreover, the subsistence activities of the majority of inhabitants are sensitive to climatic risks (e.g. sea level rise) due to environmental implications and reduced service delivery. Freshwater sources along the coastal area are subject to saltwater intrusion from rising sea level. Salt intrusions is already causing damage to agricultural activities and production, leading to compounding ecosystem degradation.

In terms of economic implications, the current losses due to climate-related risks in Maputo Municipality are estimated at USD 50 million per year and are expected to increase in the future if appropriate adaptation measures are not implemented<sup>3</sup>.

**Table 1** below presents overview of the documented shocks identified in Maputo. Each shock is described by its group, type and subtype according to the classification systems documented in the CRPT Table of Shocks (**refer to Appendix 2. List of Shocks, stresses and stressors**), and partly introduced previously in the CRPT's "Wheel of Shocks" in **Figure 1** of this section. Moreover, the table provides information on the impacts of each shock on people, assets and processes, while displaying their future trends based on climate change projection.

## Prioritization of Shocks

In order to focus the analysis on the most serious shocks in Maputo, defined in terms of the level of impacts on the city, a framework for prioritisation has been adopted. The framework is centred around people, assets and processes affected by these adverse events. Based on data collected, this section displays impacts of each shock identified regarding: people (city's inhabitants) – population injured, affected or displaced –; assets -- including physical and environmental infrastructure, among others -- and disrupted processes that have potential implications on people's livelihoods and the city's resilience.






In addition, the section presents how climate change trends have the potential to exacerbate the impacts of some of the shocks identified. In doing so, this section concludes with highlighting shocks found to require priority actions based on a qualitative analysis of all the aforementioned information.

<sup>1</sup> World Bank (2011), Mozambique - Coastal Cities and Climate Change Project; Mozambique National Institute of Disaster Management (INGC) (2012), Respondendo as mudacas climaticas em mocambique.




<sup>2</sup> Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Maputo city by the end of 21st Century.

<sup>3</sup> Queface, A.J. (eds.) (2012), Responding to Climate Change in Mozambique: Synthesis Report.

Table 1: Listing of shocks identified in Maputo and their characterisation. Source: CRPT (2019).






Identification of Shocks in Maputo			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<b>Drought</b> <ul style="list-style-type: none"> <li>Group: Natural</li> <li>Type: Drought</li> <li>Sub-type: Drought</li> </ul>	Major severe drought periods in Mozambique were recorded in: <ul style="list-style-type: none"> <li>1981-1984,</li> <li>1991-1992,</li> <li>1994-1995</li> <li>2015-2016</li> </ul> the latter was induced by El Niño.	 <p>In 2016, an estimated 1.5 million people (including 850,000 children) were affected by El Niño in Mozambique. Worrying levels (15%) of child malnutrition were recorded.</p>	Long-term projection indicates that the intensified warming and changing patterns and frequency of extreme temperatures and precipitation are expected to affect water availability and food security in the area, predominately through the disruption of harvest cycles of major crops, reduced recharge water capacity of agricultural soils, increased water demand for irrigation, and the degradation of agricultural land induced by erosion and floods.
		 <p>Shrinking water tables and food scarcity.</p>	
		 <p>Economic losses due to deficiency in agricultural production and food supply</p>	
<b>Heat wave</b> <ul style="list-style-type: none"> <li>Group: Natural</li> <li>Type: Extreme Meteorological Conditions</li> <li>Sub-type: Heat Wave</li> </ul>	Frequency of heatwave events are projected to increase in Maputo due to effects of climate change.	 <p>People: Projected temperature increase in Maputo is likely to exacerbate health risks associated with heat stress<sup>4</sup>.</p>	Maputo is expected to experience a significant increase in the frequency of heat waves by the end of the 21st century. Projected increase in the number of heat waves per season are considerable in all seasons relative to the reference period, but particularly during winter and spring. Indication that a growing risk of heat stress in the area is likely to trigger a negative health impacts on Maputo residents.
		 <ul style="list-style-type: none"> <li>Disruption in water supply</li> <li>Surge demand for electricity</li> <li>Pressure on health services</li> </ul>	

<sup>4</sup> Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Maputo city by the end of 21st Century.

Identification of Shocks in Maputo			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<b>Flood</b> <ul style="list-style-type: none"> <li>• Group: Natural</li> <li>• Type: Flood</li> <li>• Sub-type: Flash Flood, Fluvial Flood, Pluvial Flood, Coastal Flood</li> </ul>	<p>Since 1970, major flood events in Maputo occurred in: 2000, 2001, 2007 and 2008</p> <p>Floods in Maputo are closely related to tropical cyclones and sudden sea level rise or wave actions.</p>	 <p>In 2000, (February and March) 700 death cases were reported in Mozambique.<sup>5</sup></p> <p>A significant proportion of the population living in flood-prone areas in Maputo are located in informal settlements with inadequate structures and capacities.</p>	<p>Projections indicate that a warmer climate in the Maputo area will increase in the frequency of heavy and very heavy precipitation days. This intensity of precipitation will in turn increase the risk of flooding (flash, pluvial and fluvial) if effective prevention and mitigation strategies are not implemented.</p>
		 <p>Estimated economic loss from 2000 floods in Mozambique was USD 600 million.<sup>6</sup></p>	
		 <ul style="list-style-type: none"> <li>• Damage to urban infrastructure</li> <li>• Disruption in mobility system</li> <li>• Disruption in education</li> <li>• Interruption of economic activities</li> </ul>	




<sup>5</sup> McBean, G. and Henstra, D., (2003). Climate change, natural hazards and cities. Research Paper Series, no. 31. Toronto: Institute for Catastrophic Loss Reduction (ICLR).

<sup>6</sup> Kundzewicz, Z.W., et al., (2002). Floods and droughts: coping with variability and climate change. Natural Resources Forum, 26, 263-274.

Identification of Shocks in Maputo			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<b>Cyclone</b> <ul style="list-style-type: none"> <li>• Group: Natural</li> <li>• Type: Storm</li> <li>• Sub-type: Tropical Storm</li> </ul>	<p>Tropical cyclones are common events in Maputo due to the city's geographic location on the coast of Mozambique.</p> <p>The frequency and intensity of these cyclones has increased over the past ten years due to the effects of climate change.</p>	 <p>Closely related to floods; combination of torrential rains and tropical cyclones cause floods resulting in human and economic losses.</p>	<p>The intensified warming of the local climate by the end of the 21st century is likely to maintain or to exacerbate the current exposure to episodic inland flooding and destructive cyclones, caused by the expected increasing capacity of the warmer atmosphere to hold more moisture and become saturated.</p>
		 <p>Destruction of major urban infrastructure, including that supporting electricity, water and sanitation systems, as well as roads.</p>	
		 <ul style="list-style-type: none"> <li>• Disruption in basic services provision</li> <li>• Disruption in transport operations</li> </ul>	
<b>Malaria</b> <ul style="list-style-type: none"> <li>• Group: Biological</li> <li>• Type: Infectious Diseases</li> <li>• Sub-type: Parasitic Epidemic and Pandemic Disease</li> </ul>	<p>Approximately 40% of Mozambique's population carry the malaria parasite.<sup>7</sup></p> <p>The frequency of outbreaks in post-floods conditions is exacerbated by the mismanagement of waste and water systems.</p>	 <p>Malaria accounts for 48% of total external consultations and 63% of paediatric clinics and hospital admissions in rural and general hospitals and accounts for 26,7% of total mortality.<sup>8</sup></p>	<p>Impacts of climate change will have indirect effects in triggering diseases like malaria. The intensified warming of the local climate is likely to increase the frequency of destructive cyclones and floods leading to disease outbreaks in the absence of adequate clean water and sanitation as well as proper waste management systems.</p>
		 <ul style="list-style-type: none"> <li>• High pressure on health system and services</li> <li>• High pressure on public finance in health sector</li> </ul>	




<sup>7</sup> World Health Organization (2018), Mozambique signals urgency on malaria as researchers seek fresh hope.

<sup>8</sup> Peter, M. & Zacarias, O. P., (2011), Comparison of infant malaria incidence in districts of Maputo province, Mozambique, Malaria Journal 2011.

Identification of Shocks in Maputo			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<b>Saltwater Intrusion</b> <ul style="list-style-type: none"> <li>• Group: Environmental</li> <li>• Type: Water-Soil Degradation</li> <li>• Sub-type: Water Body Degradation</li> </ul>	<p>The average sea level in Maputo may be influenced by the total rainfall/runoff pattern of the catchment areas of the Incomati, Maputo and Matola river basins.</p>	 <p>Serious consequences for the urban poor who live in lowest and unsafe topographical areas and have limited capacity to adapt to the sea-level rise.<sup>9</sup></p>	<p>Maputo is already highly vulnerable to sea-level rise and coastal erosion under the present-day climate.</p>
		 <p>Restricts the availability of fresh water in coastal areas, jeopardizing food security as once-fertile land becomes barren due to high salt content.<sup>10</sup></p>	
		 <ul style="list-style-type: none"> <li>• Damage to agricultural productivity and related livelihoods</li> <li>• Decreased tourism</li> <li>• Port of Maputo and its rail links will need to be gradually relocated as the water rises</li> </ul>	

<sup>9</sup> UN-Habitat, (2009), Climate Change Assessment for Maputo, Mozambique: A summary



<sup>10</sup> Ibid

Identification of Shocks in Maputo			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<p><b>Erosion</b></p> <ul style="list-style-type: none"> <li>• Group: Environmental</li> <li>• Type: Pluvial and Coastal Erosion</li> <li>• Sub-type: Sudden Inland Erosion and Sudden Coastal Erosion</li> </ul>	<p>Erosion in Maputo is driven by a combination of natural processes (rainwater runoff, sea wave dynamics) and anthropogenic actions (construction over dunes and destruction of mangrove areas).</p> <p>In the Bay of Maputo, coastal erosion occurs mainly along the beach and Avenida da Marginal between Mira Mar and Costa do Sol.</p>	 <p>People are prone to high risk in unplanned human settlements in erosion-prone areas.</p>	<p>Maputo City is already highly vulnerable to sea-level rise and coastal erosion under the present-day climate. Along with intensified erosion, soil salinization may also be associated with current trends.</p>
		 <ul style="list-style-type: none"> <li>• Disappearance of mangroves.</li> <li>• Degradation of water quality in wells.</li> <li>• Desertification, exposure of sand dunes, worsening wind erosion.</li> <li>• Loss of coastline and lack of arable land for domestic agriculture.<sup>11</sup></li> <li>• Coastline will be dominated by steep cliffs, which will make the development of new coastal infrastructure difficult and expensive.<sup>12</sup></li> </ul>	
		 <p>Shrinkage of sand strips on the beaches result in serious coastal erosion with negative consequences for economic activity and tourism.<sup>13</sup></p>	

<sup>11</sup> Ibid

<sup>12</sup> Ibid

<sup>13</sup> Ibid

Identification of Shocks in Maputo			
Shock	Key information	Impacts on People, assets and processes	Climate change Trends*
<b>Infrastructure and service collapse</b> <ul style="list-style-type: none"> <li>• Group: Technological</li> <li>• Type: Failure of Infrastructure and Services</li> <li>• Sub-type: Basic Infrastructure Breakdown, Built Infrastructure Breakdown, Public Services Breakdown, Mobility System Breakdown</li> </ul>	Infrastructure (e.g. roads, water and electricity systems) and services (e.g. schools, hospitals) are vulnerable to extreme climatic events.	 <p>In 2019, 17 people died due to the collapse of the Hulene dump triggered by heavy rains.</p> <p>The collapse of other infrastructure and service systems, especially during floods and heavy storms, have direct impacts on the population's livelihood and safety.</p>	Increased frequency of natural shocks induced by climate change effects will have severe impacts on the built environment and urban infrastructures and processes without regular upgrading and maintenance.
		 <p>Lack of adequate building codes, regulations, and construction quality makes built assets more prone to risks related to climate change.</p>	

As explained previously, for the purpose of prioritizing shocks in Maputo, the followings were considered:

- The magnitude of impacts on population, assets and processes (refer to **Table 1**).
- Recurrence of events and their impacts on different areas of the city and its population
- Analysis of how the shocks affect different Urban Elements and Components of the urban system; consideration of interdependencies among constituent parts of the urban system.
- Projections of climate change trends in Maputo and how trends may worsen the impacts of identified shocks

Floods including flash, fluvial floods, pluvial floods and costal floods, as well as cyclones appear to have the most severe impacts across the three constituents of the urban system – People, Assets and Processes. These impacts are projected to increase significantly over the next few decades in Maputo based on the climate change data (**refer to Annex V. Future climate change, expected impacts and vulnerability in Maputo City by the end of the 21st century**).

Furthermore, biological diseases, particularly malaria outbreaks, are anticipated to increase due to the projected temperature rise and precipitation changes (whether associated with drought or excess rainfall). A recent study on Climate Trends<sup>14</sup> (**Refer to Annex V**) identifies the role of inadequate solid waste management in Maputo in increasing the frequency of malaria outbreaks, particularly following flood events. Ineffective implementation of preventive measures and a lack of proper management of waste, water and sanitation may worsen the risk factors of such outbreaks.

Long-term projections of climate change trends suggest an increased frequency and severity of drought and heat waves, resulting in serious implications across various urban sectors. While health stress due to heatwave occurrence

<sup>14</sup> Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Maputo city by the end of 21st Century.



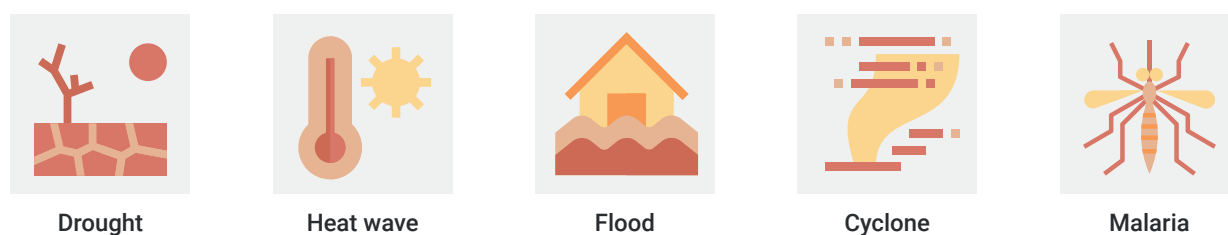
are expected to cause marked health issues and apply major pressure on health services in the city, droughts are projected to increase cases of malnutrition and lead to significant economic losses due to shrinking water tables, thus resulting in decreased agricultural production and associated food scarcity.

Spatial analysis of risks in Maputo shows that shock events, regardless of their types and origins, are highly interrelated and their impacts are aggravated by a combination of exposure and vulnerabilities factors, mainly:

- A significant number of the city's inhabitants, of which a majority is characterised as socio-economically disadvantaged, are located in areas that are highly prone to risks of floods, sea-level rise and coastal erosion, and lack adequate delivery of basic services and risk preventive infrastructure, such as water drainage network.
- The living conditions in these risk-prone areas are precarious as most of the settlements are informal where adequate structures and basic services supply are lacking.
- The livelihood practices of residents in risk-prone areas (including agricultural practices, securing basic needs, and construction practices) will become more challenging due to the deterioration of the ecosystem and biodiversity loss along the coastal areas, such as the destruction of mangroves.

Based on the above explanation of the qualitative analysis conducted, five shocks are prioritized in Maputo:

- **Natural:** Drought, Heatwave, Floods and Cyclones.
- **Biological:** Malaria.



**Figure 2:** Prioritised shocks in Maputo. Source: CRPT (2019).

Finally, a combination of a cross-sectional qualitative reading made by experts from the CRPP and stakeholder consultation was conducted with the purpose of validating the outcomes of this analysis.

These five key shocks – priority shocks – will be explained in further details through the following sections.

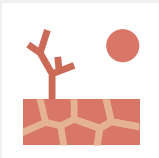
## Description of Prioritized Shocks

The following paragraphs describe the key shocks that concern Maputo. This description covers the frequency of occurrence, causes, secondary shocks that can be triggered, and affected Urban Elements and Components.

### Drought

Mozambique has faced serious drought periods due to intensified temperature and changing patterns in precipitation<sup>15</sup>. The most severe drought events recorded over the past decades were in 1981-1984, 1991-1992, 1994-1995 and more recently due to the effects caused by the El Niño in 2015-2016.

As presented in **Table 2** below, droughts trigger secondary shocks related to water supply, food supply, degradation and desertification of land and nutritional diseases due to major impacts on agriculture. Therefore, they also have direct social and economic impacts on the urban system.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
<b>Drought</b> 	<ul style="list-style-type: none"> <li>• Water Crisis</li> <li>• Food Crisis</li> <li>• Land Degradation and Desertification</li> <li>• Nutritional diseases</li> </ul>	Supply Chain and Logistics <hr/> Social Inclusion and Protection	Water Resources, Food Resources <hr/> Access to basic Social Services (Food)

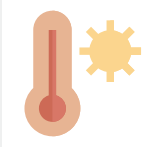
**Table 2:** Secondary shocks triggered and affected Urban Elements and Components by droughts. Source: CRPT (2019).

<sup>15</sup> Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Maputo city by the end of 21st Century.

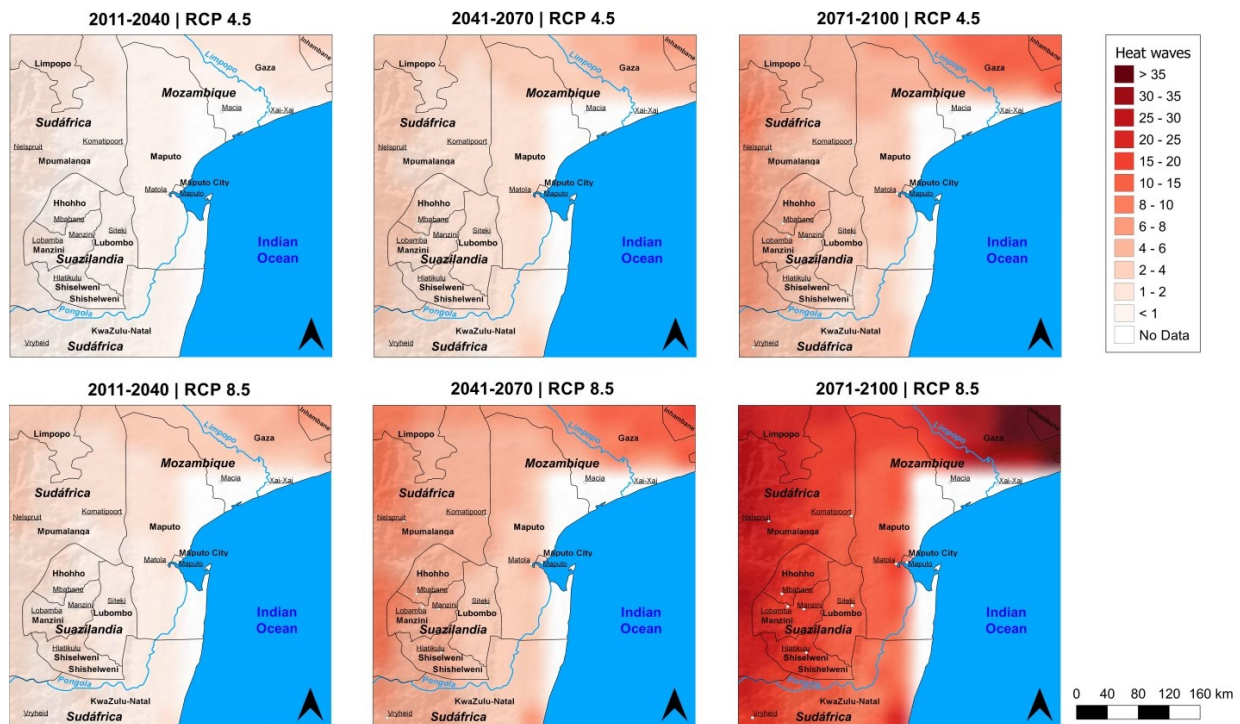
## Heat wave

Historical data indicate that most areas near the coast of Maputo recorded an increase of 0.32°C in the mean annual maximum air temperature per decade and a decrease of 0.04°C in the average annual minimum temperature per decade during in the 1970-2006 period. In the areas of Maputo farther from the coast the mean annual maximum air temperature increased by 0.23°C per decade, while the minimum temperature increased by 0.33°C per decade over the same period. Climate projections indicate that between 2046-2065 the average annual maximum and minimum air temperature in Maputo could increase by 2.1°C and 2.2°C, respectively.

According to the Maputo Local Adaptation Plan (2016), the direct impacts of the heat waves are the increase in energy demand for cooling, increased evapotranspiration and water scarcity, deterioration of air quality, and urban heat islands that may be aggravated even further by temperature rise. Moreover, the intensified warming of the local climate is likely to exacerbate health risks associated to heat stress and maintain or increase the frequency of episodic inland flooding and destructive cyclones due to a warmer, more saturated atmosphere.<sup>16</sup> **Figure 3** below shows how heat waves are predicted to increase in the next decades in Maputo.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
<b>Heat wave</b> 	<ul style="list-style-type: none"> <li>Water Crisis</li> <li>Agriculture (Food Crisis)</li> <li>Biodiversity Loss and Ecosystem Degradation</li> </ul>	Supply Chain and Logistics	Water Resources, Food Resources
		Social Inclusion and Protection	Access to basic Social Services (Food)

**Table 3:** Secondary shocks triggered and affected Urban Elements and Components by heat waves. Source: CRPT (2019).



**Figure 3:** Heat waves projections in Maputo.

Source: "Future climate change, expected impacts and vulnerability in Maputo City by the end of the 21st century".

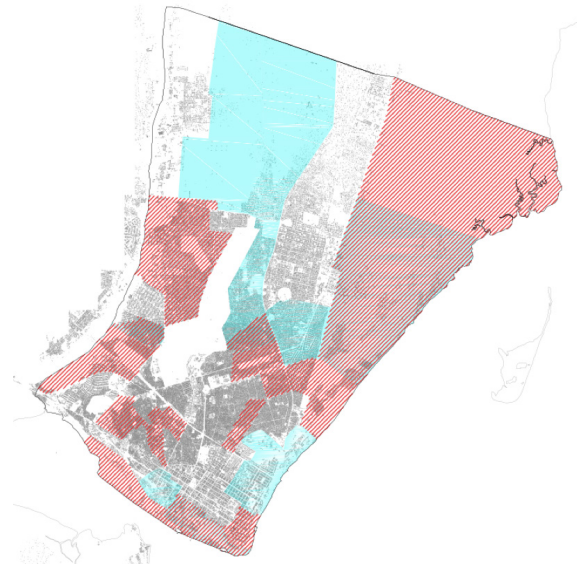
<sup>16</sup> Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Maputo city by the end of 21st Century.

## Flood

Since 1970, four major flood events have been reported in Maputo: in 2000, 2001, 2007 and 2008.<sup>17</sup> Maputo is situated downstream of two major southern African river systems, the Limpopo and Incomati river basins. When heavy rainfall occurs anywhere in the region, increased river flows are experienced in Maputo. This situation has been exacerbated by trans-boundary policies which favour South Africa and do not protect Maputo from the impacts of climate change. As a result, Maputo is vulnerable to both instances of drought and flooding.<sup>18</sup>


Projections indicate that under the warmer climate Maputo will experience an increase in the frequency of heavy and very heavy precipitation days.<sup>19</sup> This intensity of precipitation will increase the risk of flash, pluvial and fluvial flood.

**Figure 4** below shows areas in Maputo subject to flooding, highlighted in blue, overlapped with storm water drainage main critical areas. It can be observed that these areas coincide with the coastal strip and with some long-standing slum neighbourhoods scattered in the city centre, such as Mafalala, Luis Cabral, Chamanculo and Xipamanine.



**Figure 4:** Areas prone to flooding (blue) overlapped with storm water drainage main critical areas (dashed red). Source: CRPP based on information provided by PEUMM (2008).

Flood events lead to erosion of coastal areas and landslides. Moreover, the inadequate management of water systems and waste collection aggravates the risks of vector-borne diseases such as malaria. Intense and frequent flooding also disrupts the provision of services and leads to the degradation of infrastructural and environmental assets, as presented in the **Table 4** below.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
<b>Flood</b> 	<ul style="list-style-type: none"> <li>Degradation of coastal environment</li> </ul>	Built Environment	Housing, Built Assets
	<ul style="list-style-type: none"> <li>Vector-borne diseases</li> </ul>	Ecology	Biodiversity and green Areas
	<ul style="list-style-type: none"> <li>Landslide</li> </ul>	Supply Chain and Logistics	Water Resources, Energy Resources, Food Supply, Logistics
		Basic Infrastructure	Water and Energy Supply, Solid Waste Management
		Mobility	Urban and Inter-Regional Mobility

**Table 4:** Secondary shocks triggered and affected Urban Elements and Components by floods. Source: CRPT (2019).

<sup>17</sup> UN-Habitat, (2009), Climate Change Assessment for Maputo, Mozambique: A summary


<sup>18</sup> Local Governments for Sustainability (ICLEI), (2011). Sub-Saharan African Cities: A Five Cities Network to Pioneer Climate Adaptation Through Participatory Research Land Local Action

<sup>19</sup> Lobelia by IsardSAT (2018), Future climate change, expected impacts and vulnerability in Maputo city by the end of 21st Century.

## Cyclone

Since 1970, Mozambique has been affected by 34 significant cyclones or tropical depressions.<sup>20</sup> Due to Maputo's geographical location in the coast line of Mozambique, the area is commonly exposed to cyclones each year between October and April. However, the frequency of significant cyclones or tropical depressions to which the city is exposed has increased over the last 10 years from.

Strong winds, storm surges, and heavy rains from cyclones damage infrastructure, disrupt water, sanitation and electricity supply systems, and degrade the coastal environment, among other impacts as detailed in the **Table 5** below.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
<b>Cyclone</b> 	<ul style="list-style-type: none"> <li>• Degradation of coastal environment</li> <li>• Flooding</li> <li>• Landslides</li> </ul>	Built Environment	Housing, Built Assets
		Ecology	Biodiversity and green Areas
		Supply Chain and Logistics	Water Resources, Energy Resources, Food Supply, Logistics
		Basic Infrastructure	Water and Energy Supply, Solid Waste Management
		Mobility	Urban and Inter-Regional Mobility

**Table 5:** Secondary shocks triggered cyclones. Source: CRPT (2019).

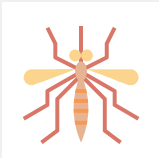
<sup>20</sup> UN-Habitat, (2009), Climate Change Assessment for Maputo, Mozambique: A summary

## Malaria

Malaria is one of the world's most important tropical diseases and one of the principal health issues in Mozambique.<sup>21</sup>

According to WHO (2018), Malaria is one of the world's leading causes of poverty and affects livelihoods such as the performance of children in school and the productivity of employees in the workplace, disrupting everyday life.<sup>22</sup> About 40% of Mozambique's population carry the malaria parasite, suggesting extensive stress on the public health system and related government finances.

Moreover, it has been estimated that diseases such as malaria and HIV/AIDS trigger approximately half of all cases of malnutrition globally.<sup>23</sup> This also highlights the importance of considering malaria impacts in order to tackle nutrition, urban poverty and public health issues.

Priority Shock	Triggered Secondary Shocks	Affected Urban Element	Affected Components
<b>Malaria</b> 	Health Hazard	Social Inclusion and Protection	Health Access

**Table 6:** Secondary shocks triggered and affected Urban Elements and Components by malaria. Source: CRPT (2019).

<sup>21</sup> Majjender, P. & Zacarias, O. P., (2011), Comparison of infant malaria incidence in districts of Maputo province, Mozambique, *Malaria Journal* 2011.

<sup>22</sup> World Health Organization (2018), Mozambique signals urgency on malaria as researchers seek fresh hope.

<sup>23</sup> Brown, M. E. and Funk, C. C. (2008), "Food Security Under Climate Change". NASA Publications. 131

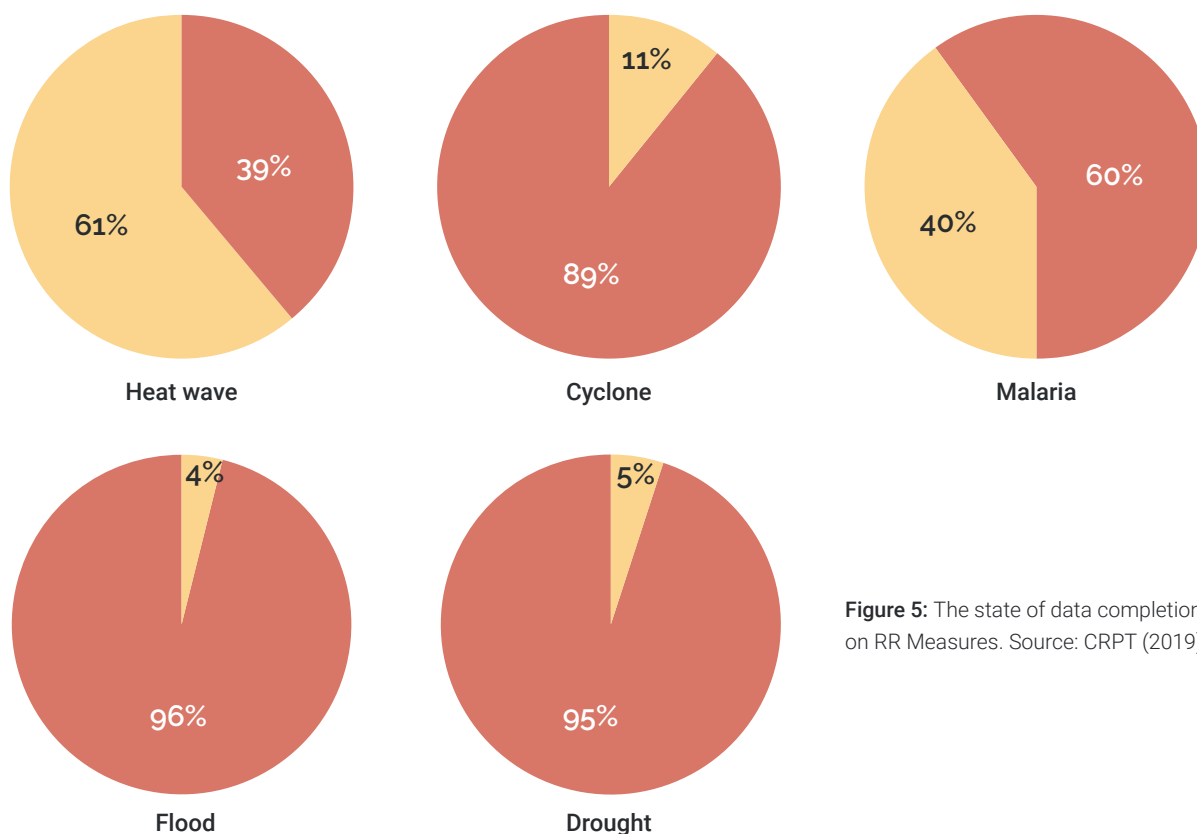
## The State of Risk Reduction Measures in Maputo

This section analyses data collected through the Urban Context concerned with measures and policies available at the local level, which are conducive to decreasing the risk of adverse events such as shocks. Particularly, this section examines existing risk reduction measures in regard to the identified priority shocks in Maputo.

### Data Collection Assessment

As demonstrated in **Figure 5** below, the average completion rate of data collection for risk reduction (RR) measures for all five shocks is 75%. As illustrated in the figures below, there is a notable availability of data on RR measures related to natural shocks, namely floods, with a rate of (92%); while for the biological shock of malaria, there exists significantly less data available with only (44%) of questions answered. Data collected is primarily derived from interviews and workshops with experts at Mozambique's National Institute of Disaster Management (INGC), local and international NGOs working in relevant fields, and from the review of studies and research carried out by universities and research institutes.

Regarding risk reduction measures, data availability is far better for questions falling under the category of Risk Assessment, Early Warning system, while data on Risk Management, particularly long-term risk mitigation measures, and Recovery Planning are far more limited.



**Figure 5:** The state of data completion on RR Measures. Source: CRPT (2019).

### Risk Assessment

Risk assessment is defined as a qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could pose harm to people, property, services, livelihoods, and the environment on which people depend. Ideally, a risk assessment process would include hazard analysis, exposure assessment, vulnerability analysis and capacity assessment.

Data shows that risk assessment is carried out in Maputo for some of the natural priority shocks, namely floods and cyclones, albeit irregularly. These assessments are focused on exposure and vulnerability analyses, particularly spatial mapping of areas prone to floods and to the severe impacts of cyclones. Due to the unavailability of data, it is difficult

to determine whether the outcomes of the assessments are consolidated into local risk management plans. Outcomes of risk assessments, including risk maps, are mostly, or partially, not accessible to the public, making public awareness regarding plausible threats limited.

## Early Warning Systems - EWS

Early Warning System refers to an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.<sup>24</sup> Three key elements contribute to the enhancement of an Early Warning System's performance: monitoring and warning services, response capability, and warning dissemination and communication.

Data indicates that existing EWS in Maputo exist for monitoring meteorological shocks (subset of natural hazards) -- floods, tropical cyclones, and heatwaves--, are more limited regarding biological ones such as malaria. Flood and cyclone EWS are established throughout Mozambique and include regular monitoring, especially in areas where river floods are likely to occur. However, response rates to warnings are often delayed, hindering the purpose of these systems, which is a reduction in loss of life. Such delays are attributed, in part, to the unclarity and, at times, inaccuracy of messages as well as the use of technical language that is not accessible by the general public. Furthermore, data collected indicates that limited financial and technical expertise hinders the effectiveness of these systems.

## Risk Management

Risk Management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk, and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.<sup>25</sup> Measure considered for evaluation under risk management include those described as long-term (predominately related to mitigation) and those aimed at immediate emergency response including preparedness and contingency planning. Mitigation is the lessening or minimising of the adverse impacts of a hazardous event,<sup>26</sup> while preparedness is the knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.<sup>27</sup>

Based on the data collected, there has been significant effort over the past decade in localizing mitigation in Maputo for natural shocks, culminating in the development and implementation of a number of local plans. A selection of key planning and ongoing initiatives are described briefly below:

- Plano de Adaptação às Mudanças Climáticas (2017) was developed to strengthen mangroves in coastal areas to protect the settlements from coastal flooding.
- Planning for building river dams and corresponding basins in the metropolitan region of Maputo is ongoing, an undertaking aimed at mitigating the risk of drought.
- Efforts are ongoing for setting building codes and regulations, though data suggests the existence of challenges related to enforcement, particularly in informal settlements, many of which are located in risk prone areas.
- Regarding malaria, the Plano Estratégico Malaria 2012 – 2016 was developed by the Ministry of Health through the National Malaria Control Program (PNCM). It presents the vision and mission of PNCM for reducing malaria morbidity and mortality by half in 2016 compared to levels of this disease observed in 2009. The objectives of the plan remain mainly response-oriented; strategies for mitigating root triggers of the disease, such as proper waste management, and access to clean water and sanitation, are not directly addressed.

<sup>24</sup> United Nations Office for Disaster Risk Reduction (UNDRR) (2017), Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.

<sup>25</sup> Ibid.

<sup>26</sup> Ibid.

<sup>27</sup> Ibid.



- Preparedness and Contingency Planning (Plano de Prontidão e Resposta) is updated annually and implemented, while Standard Operation Procedures (SOP) drafted by the national government with the support of the World Bank is currently under approval, thus not yet implemented. Regarding both of these planning efforts, government financial, human and technical capacities remain limited, resulting the hinderment of proper implementation.

## Recovery

Recovery is the restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.<sup>28</sup>

Based on the data available on recovery planning, there is no explicit pre-disaster recovery planning (PDRP) in the country. Nevertheless, the new Plano Director para a Redução do Risco de Desastres 2017-2030 (PDRRD 2017-2030), which is aligned with the Sendai framework, is oriented towards the development of a national PDRP.

Strategies for recovery are within the competencies of the national government. However, the role of the National Institute of Disaster Management (INGC) in recovery is limited, as recovery responses have generally been managed and coordinated by the relevant ministries for each affected sector with the oversight of the CCGC (WB, 2005). Over the last years, national government recovery strategies have been focused on securing external assistance and funding for prevention and recovery in line with Plano Director de Gestão de Desastres, Plano Quinquenal do Governo and PARPA.

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<sup>28</sup> Ibid.

## Key Findings

- Maputo Municipality's Governance Structure and Environmental Management Department manages all climate-induced hazards such as floods and cyclones, as well as environmental risks such as coastal erosion. The Municipality primarily follows the National Disaster Risk Management Plan through the establishment of Local Committees for Disaster Risk Management in villages within the Municipal Area. For some specific shocks and their related risks, the Department of Environment is responsible for the development of contingency plans and community awareness, including the coordination of drills. More specifically, a Water Drainage Management Plan has been established, as part of flood mitigation and management in several neighbourhoods prone to floods such as Chamanculo.
- The restructuring of the INGC and its organizational processes is intended to bridge the gap between long-term sustainable reconstruction and humanitarian actions following adversities.
- While data shows that marked efforts are being undertaken by Maputo Municipality in terms of Risk Reduction Measures, the implementation of long-term mitigation measures and awareness raising strategies may be more challenging due to normative and institutional realities, including the complexity of coordination among different levels of governance. Maputo is exposed to the risk of multiple shocks, of which some are natural, environmental, or biological. Some of these (floods, storms and Dengue) pose relatively significant risk on the urban system and thus require priority actions aimed at alleviating the consequences of such events. In addition to the direct and indirect effects of climate change, a combination of factors contributes to worsening the impacts of shocks identified in Maputo:
  - Unplanned urbanisation which results in developments located in risk-prone areas, exposing inhabitants to risk, endangering the natural ecosystem and negatively affecting biodiversity.
  - Limited financial and technical capacities at the local level for strategic infrastructure projects conducive to preventing and mitigating disaster risks.
  - Lack of cross-sectoral coordination on common mechanisms for appraising, planning, implementation and monitoring.
  - Enforcement of building codes and regulations is challenging, especially in informal settlements which are mostly located in areas that are exposed to severe impacts of shocks.
  - Climate change trends pose further challenges and aggravate Maputo's susceptibility to risks of floods, cyclones and heatwaves.
  - The impacts of shocks affect the urban poor most severely, whose vulnerabilities remain challenging to address.

It is also important to highlight that the consequences of shocks interrelate, and have direct impacts on, the stresses that the city is undergoing and challenges it faces. Conversely, vulnerabilities and weaknesses present in the urban system due to pressures posed by stresses and challenges aggravate the impacts of shocks.





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**Key Messages:  
Climate Change**



## Key messages

# Future climate change, expected impacts and vulnerability in Maputo City by the end of the 21st century

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# Key messages

## Table of contents

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<b>1</b>	<b>Future air temperature and precipitation change .....</b>	<b>6</b>
1.1	<b>18 GCM ensemble projections .....</b>	<b>6</b>
1.2	<b>Downscaled air temperature and precipitation projections .....</b>	<b>9</b>
1.2.1	Air Temperature .....	9
1.2.2	Precipitation .....	12
<b>2</b>	<b>Future changes in climate extremes .....</b>	<b>14</b>
2.1	<b>Temperature extremes .....</b>	<b>14</b>
2.2	<b>Precipitation-based extremes .....</b>	<b>17</b>
<b>3</b>	<b>Expected impacts and vulnerabilities.....</b>	<b>20</b>
<b>4</b>	<b>References .....</b>	<b>21</b>

# Key messages

## 1 Future air temperature and precipitation change

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Maputo City, the capital of Mozambique, is a densely populated city (3,648 inhabitants/km<sup>2</sup>) with a high positive population dynamics (due to the high birth rates and immigration), posing a great challenge to the local government to ensure basic services, food supply and to improve life-support infrastructure (UN-HABITAT<sup>1</sup>). Through its geographical position, at 47 m a.s.l., on the East African side, open to the Indian Ocean, the city lies in a tropical savanna climate (Aw in the Koeppen-Geiger classification) and is particularly vulnerable to destructive cyclones, inland flooding, pluvial erosion, as well as to coastal erosion due to sea level rise and sea wave dynamics. It is worth mentioning that in 2010, the World Bank and INGC recognized Maputo as a city particularly prone to climate change-associated risks in Mozambique.

### 1.1 18 GCM ensemble projections

- *Climate of Maputo City is projected to become warmer than today by the end of the 21<sup>st</sup> century, under both selected RCPs. Mean annual temperature is estimated to increase between 1 to 2.4°C under RCP4.5 and between 1.1 to 4.3°C under RCP8.5. In the worst case scenario (RCP8.5), the climate warming is particularly intense after 2070, when the annual temperature is estimated to reach almost 27°C.*
- *Throughout the year, the distribution of temperature increase magnitudes shows visible differences between the RCPs and future time-intervals. In general, the averaged projected temperature change over the hot season (December-March) is superior to those estimated for the cool season (June-August), under both RCPs, especially in the mid- and far-future.*
  - *In RCP4.5: air temperature is projected to increase in general at fairly comparable magnitudes in all months of about 1°C by 2040 and with 1.6-1.8°C by 2070. In the far-future, the warmth has a more pronounced seasonality, indicating peak temperature increases of about 2.5°C in May and October, relative to those projected for other months like August and February, for which the rise is limited to about 2.1-2.2°C.*

<sup>1</sup> <http://urbanresiliencehub.org/city-population/maputo/>

# Key messages

- In RCP8.5: the climate warming signal is particularly intensified, revealing distinct time-intervals of intense warming over the year – with more than 2.5°C from March to May and from October to December, in the mid-future; with about 4°C in January-February, June-July and in September and with more than 4.4-4.5°C from March to May and from October to December, in the far-future.

Expected evolution of monthly air temperature in the Maputo City by the end of the 21<sup>st</sup> century under different scenarios is shown in Figure 1.

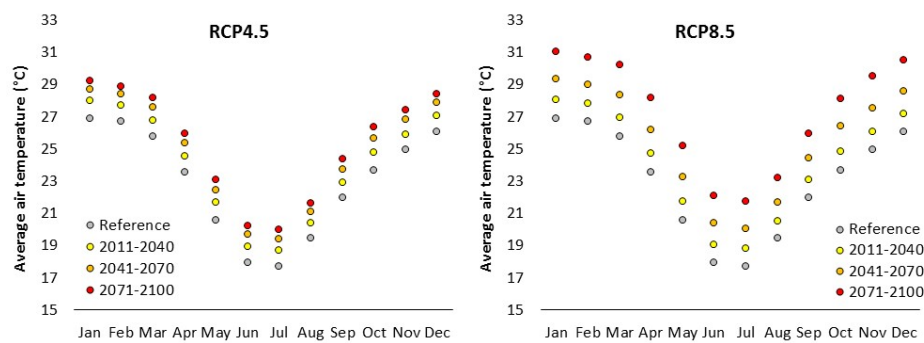


Figure 1 Projected average air temperature in the Maputo City by 2100, under different climate scenarios (ensemble mean of 18 GCMs).

- There is a great asymmetry in the diurnal warming in the area of the Maputo City, as a stronger warming is projected by maximum temperature (daytime) and less by minimum temperature (night-time), all over the year, in over all future time-intervals and in both RCPs. In general, daytime warming is up to 1°C stronger than night-time all over the year under both scenarios. Exceptionally, in RCP8.5, daytime warming is particularly intense than night-time (with more than 1°C) in the far-future, over several months of the year: January and October (1.3°C), June (1.2°C), November and December (with about 1.7°C).
- In RCP4.5: maximum temperature is projected to increase substantially in some distinct months or intervals, as follows: with about 1.6°C in May, June, August and October, in the near-future, suggesting a possible lengthening of the hot season towards autumn; with about 2.5°C in June, October-December, in the mid-future, at the beginning of hot season and also, overlapping the first part of the wet season in the Maputo area (October-April); and with about 3°C from April to December, overlapping much of the dry season in the area (especially in May and June, 3.2-3.3°C). Lowest increases in daytime temperatures are projected in February (mid-future and far-future) or March (near-future), at the

# Key messages

end of the hot season. Night-time, the monthly distribution of warming magnitudes are somewhat synchronized to those projected daytime, indicating peak increases in May-August (over 1 °C) in the near-future, in May (about 2 °C) in the mid-future and in January and from March to December (over 2 °C) in the far-future.

- In RCP8.5: the projected positive changes in the seasonal cycle of maximum temperature, indicate the same intervals of maximum throughout the year in all future time-intervals: in January, April-June, September and December (above 1.6 °C) in the near-future; in January and from April to December (above 3 °C) in the mid-future; and in January, May-June and November-December (above 5.5 °C) in the far-future. Night-time, peak warming magnitudes depicts the same months and intervals as daytime, but with more diminished values.
- Maputo City has a relatively dry climate, with an annual precipitation total of about 800 mm. In the reference period, the wet season has a muggy and mostly clear weather and lasts from October to April, while the dry season, windy and clear, covers the April-October interval. *Over the 21<sup>st</sup> century, change signal in precipitation intensity (mm/day) is mixed, both increases and decreases being likely in the target area (Fig. 2).*
  - In RCP4.5: projected decreases are apparently stronger in magnitude, likely to affect the target area especially in September and October, in all future time-intervals but more visibly in the mid- and far-future, with about 24-42% in September and 21-25% in October. The negative change signal in these months is robust as about 60-90% of GCMs in the ensemble agreed on the trend sign. Slighter decreases but robust in terms of model agreement, are also projected in March (in the near and mid-future) and April (in all future time-intervals), but in both cases the estimated change is of less than 10%. Projected positive (robust) changes are rather slight and depict especially the February month, for which a 5 to 22% increase in precipitation intensity is expected by 2100 in Maputo area.
  - In RCP8.5: the negative change signal appears more intensified and extended throughout the year across the area. Most robust decreases are expected in March-April (in all future time-intervals), as well as in May (in the mid-and far-future), but with magnitude of less than 10%, and from July to November, (with peak values in September and in the far-future), in the range of 10 to 50%.

# Key messages

- Least consistent change signal in precipitation intensity (by means of trend sign agreement between the GCM members of the ensemble) has been projected for January (over 2011-2040, in both RCPs), March, July and December (over 2041-2070, in RCP4.5) and in June (over 2071-2100, in RCP8.5).

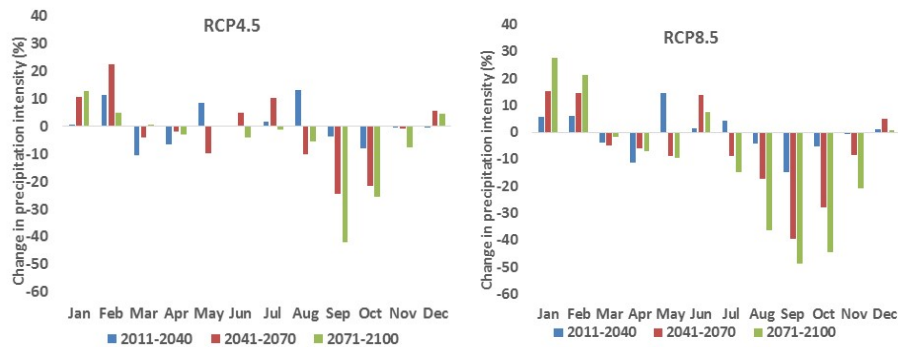


Figure 2: Projected monthly precipitation change in Maputo by the end of the 21<sup>st</sup> century, based on the simulations of 18 GCMs (RCP4.5 and RCP8.5).

## 1.2 Downscaled air temperature and precipitation projections

### 1.2.1 Air Temperature

The downscaled RCP4.5 scenario of average temperature from EC-EARTH GCM provides also evidence of a visible and ongoing warming in Maputo by the end of the 21<sup>st</sup> century. On annual scale, the downscaled scenario suggest an increase with up to 1.9°C relative to the reference period, corresponding a rise of the annual temperature to about 25°C in the far-future. Throughout the year, the largest increases are projected in March (with 1.6°C in the mid-future and 2.01°C in the far-future) and April (with 1.7°C in the mid-future and 2.3°C in the far-future). These months are relevant as they mark the end of hot season and of the wet season, respectively. These trends might suggest a *lengthening of the hot season in the detriment of the cool (thermal comfortable) one*, lasting from June to August under present-day climate conditions. Is this worth mentioning that, in the near-future, least temperature increase is projected from February to April (with less than 1°C). In the mid-, but especially in the far-future, warming signal in this months is expected to intensify most significantly compared to the other months of the year.

Under RCP8.5, climate warming is visibly intensified relative to present-day conditions. On annual scale, average temperature is projected to increase in Maputo City with 1.5°C by 2040, with 2.5°C by 2070 and with 3.9°C by 2100. Monthly temperature increases are expected to exceed the annual rates at the end of warm season (March-April), with peak warming rates in April of 2.8°C by 2070 and in



# Key messages

March-April of 4.1-4.3°C by 2100. During the cool season, large temperature increases are expected by 2100, in May and June, (of about 3.9°C), as well as in November and December (of 3.8-3.9°C). This temperature change signal is also suggestive for indicating a lengthening of the hot season in the detriment of the cool (thermal comfortable) one, as also projected under RCP4.5.

- Comparing the two projection datasets, the warming signal is coherent and obvious, but shows different magnitudes depending on the selected RCP and future time-interval. In RCP4.5, the projected warming from downscaled simulations is slightly lower than that projected by the 18GCM ensemble, mostly in the mid- and far-future (Table 1). In the near-future, downscaled simulations provide evidence of a slightly stronger warming than that projected by the 18GCM ensemble during the cool season of the year, generally from June to September. However, differences in magnitudes are rather small, below 0.3°C. An opposite situations have been observed in the rest of the year, from October to May, except January, during which local climate warming has been found to evolve at fairly comparable magnitudes in both sets of projection runs. Under RCP8.5, the downscaled warming is stronger than that projected by the 18 GCM ensemble only over the near- (2011-2040) and mid-future (2041-2070) intervals (except October and November), while after 2071 the magnitude pattern is reversed, providing evidence of a stronger warming from the downscaled projections, all over the year.

Table 1: Future temperature change in the Maputo City at different spatial resolutions and RCPs (RCP4.5 and RCP8.5)

Months	Projections	2011-2040		2041-2070		2071-2100	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5	RCP4.5	RCP8.5
January	1	1.1	1.4	1.5	2.6	1.8	3.9
	2	1.1	1.2	1.8	2.5	2.3	4.1
February	1	0.9	1.7	1.5	2.5	1.9	3.7
	2	1.0	1.1	1.8	2.3	2.2	4.0
March	1	0.9	1.4	1.6	2.6	2.0	4.1
	2	1.0	1.2	1.8	2.6	2.4	4.4
April	1	0.9	1.6	1.7	2.8	2.3	4.3
	2	1.0	1.2	1.9	2.6	2.4	4.6
May	1	1.0	1.4	1.4	2.6	2.0	3.9
	2	1.1	1.2	1.9	2.7	2.5	4.6
June	1	1.2	1.4	1.4	2.6	2.0	3.9
	2	1.0	1.1	1.8	2.5	2.3	4.2
July	1	1.2	1.6	1.6	2.6	1.9	3.7
	2	1.0	1.1	1.7	2.4	2.3	4.0
August	1	1.2	1.5	1.5	2.5	1.7	3.7

## Key messages

	2	1.0	1.0	1.6	2.2	2.1	3.8
September	1	1.1	1.7	1.4	2.4	1.9	3.8
	2	0.9	1.1	1.8	2.4	2.4	4.0
October	1	1.0	1.5	1.5	2.4	1.8	3.5
	2	1.1	1.1	2.0	2.8	2.7	4.5
November	1	0.9	1.3	1.4	2.3	1.8	3.8
	2	1.0	1.1	1.9	2.6	2.4	4.6
December	1	0.9	1.5	1.3	2.5	1.8	3.9
	2	1.0	1.1	1.8	2.5	2.4	4.5

1 – Downscaled projections (30 km); 2 – projections of the 18 GCM ensemble (50 km).

- The downscaled projections for Maputo City provide evidence for an asymmetric diurnal warming similarly to the projections of the 18 GCM ensemble. In the baseline period (1971-2010), climate warming is apparently more important during the day (maximum temperatures) than at night (minimum temperatures). This pattern maintain only on near-term (2011-2040) in RCP4.5 and only in April and September. In the rest of the year and in the other future-time intervals, projected warming is stronger night-time than daytime.
  - In the near-future (2011-2040): night-time warming is generally stronger than daytime over most of the year in both RCPs. However, some exceptions are expected depending on the selected RCP. In RCP4.5, night-time warming is estimated to overpass the daytime one except April and September, when the signal is opposite and May, when daytime and night-time warming is expected to have fairly similar magnitude of 1.1°C. In RCP8.5, night-time and daytime warming is expected to have similar magnitudes in May-April, July and September. In this scenario, minimum temperatures is projected to increase with more than 1.5°C in all months, with peak magnitudes of over 2°C in February and October, while maximum temperatures, in February, May, July and over September-October interval.
  - In the mid-future (2041-2070): night-time warming is also stronger than daytime, especially in March-April and in December (under RCP4.5). In the worst case scenario, projected increase in maximum temperature could exceed 2.5°C in most months (except October and November), whereas minimum temperatures is expected to rise with more than 3°C in January, March-April and from June to August.

# Key messages

- In the far-future (2071-2100): diurnal warming shows similar distribution as over the mid-future time-period, with a greater contribution of night-time warming than daytime most visible in March-April and in December (in RCP4.5). The projected rise of minimum temperature is expected to exceed 4°C, extensively throughout the year, with peak warming magnitudes (of almost 5.0°C) in March-April and June.
- Comparing the magnitudes of the diurnal warming in the Maputo area derived from two climate projection datasets (the downscaled and the 18 GCM ensemble) we found the followings:
  - Increase in maximum temperatures is projected larger by the GCM ensemble in the near-future (RCP4.5) and mid- and far-future (RCP8.5). Apart from these exceptions, the situation is reversed for the 2041-2070 and 2071-2100 in RCP4.5 and for 2011-2040 in RCP8.5.
  - The projected minimum temperature increase is larger in the downscaled dataset compared to that estimated from the 18 GCM ensemble in all future time-intervals and in both RCPs, generally from June to October (2041-2070) or even January (2071-2100) in RCP4.5 and all over the year in RCP8.5.

## 1.2.2 Precipitation

*The future change signal in precipitation intensity (mm/day) from the downscaled RCP4.5 scenario of EC-EARTH GCM in the area of the Maputo City is inhomogeneous, both increases and decreases being expected to the end of the 21<sup>st</sup> century. According to these projections, over January-April interval precipitation intensity is expected to be on a general decrease, especially in February (in all future time-intervals, with 18 to 27%), as well as in April and May, mostly in the near-future, with 18 to 31%. Major decreases have been projected in July with 20 to 34% and in September with 18-28%, especially in the near- and mid-future. A moderate changing signal of precipitation intensity is expected in June and is positive, suggesting an increase of 11 to 36%, especially in the mid-future. Other increases of precipitation intensity in the target area are expected also in October (in the mid- and far-future, with 15-33%) and in December (also in the mid- and far-future, with 27-31%).*

*It could be noted that the projected magnitude of changes under RCP4.5 derived from downscaled EC-EARTH GCM suggest an opposite signal than that estimated by*

# Key messages

the 18GCM ensemble, in the first part of the year, more specifically for January and February, as well as in the middle of the year, in July (Fig. 3).

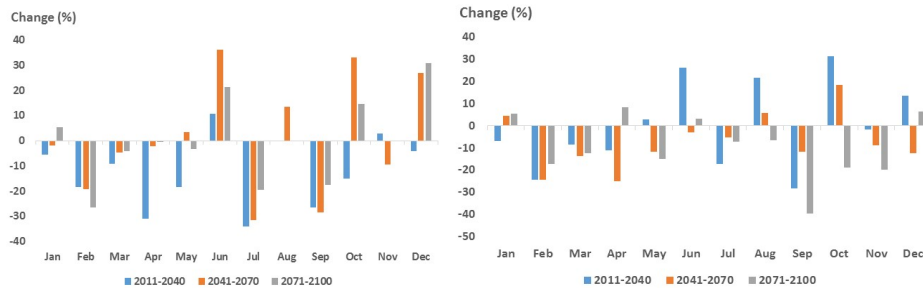


Figure 3. Projected changes in precipitation intensity (mm/day) in the area of Maputo City by the end of the 21st century from downscaled EC-EARTH GCM (RCP4.5 – up, RCP8.5 – down).

In RCP8.5, projected changes in precipitation intensity (mm/day) from the downscaled EC-EARTH GCM in the area of the Maputo City is also inhomogeneous likewise RCP4.5, but the negative signal is more generalized throughout the year, in all future time-periods. In this scenario, the last part of the wet season (February to May) is also dominated by a decrease of precipitation intensity as in RCP4.5, especially in February (in all future time-intervals, with 17 to 24%), as well as in April (mostly in the mid-future, with 25%). Most important decreases have been projected in September, at the beginning of the wet season in the area, with 28% in the near-future and about 40% in the far-future. The projected patterns of change in this climate parameter are somewhat comparable between the two selected RCPs, as both scenarios are depicting the same distinct months in which precipitation intensity is expected to decrease in the Maputo area relative to present-day conditions. However, most obvious difference between the two RCPs is in the change signal is associated to July, for which the moderate scenario is projecting a larger decrease by 2100 (up to 30%) than the worst case scenario (up to only 17%). Projected positive changes in precipitation intensity are also moderate under RCP8.5, pinpoints the same months of the year as in RCP4.5, but they are mostly expected in near-future and less in the other future-intervals (as in RCP4.5): October (32%), June (26%), August (22%) and December (13%).

The change signals in precipitation intensity derived from the two climate projection datasets (downscaled EC-EARTH GCM versus the 18GCM ensemble) are rather antagonist, depicting different intervals of decrease or increases. It is worth mentioning that the estimated changes from GCM ensemble have a more clear seasonality pattern of change compared to the downscaled projections, suggesting that precipitation intensity is expected to increase especially in the last part of the wet season and to decrease notably at its beginning. Moreover, this pattern appears to intensify by the end of 2100 and in the worst case scenario.

# Key messages

## 2 Future changes in climate extremes

### 2.1 Temperature extremes

- *Substantial increasing frequency hot tropical nights during the months of the cool season. In response to the expected warming intensification by 2100, the projected number of tropical nights under RCP4.5 are likely to increase considerably in winter, from June to August (with 12 nights in the mid-future and up to 19 nights in the far-future) and in spring, from September to November (with 26 nights in the mid-future and 31 nights in the far-future). In the worst case scenario (RCP8.5), this change signal intensifies significantly especially during the cool season, indicating a growing risk of heat stress in the area likely to trigger a potentially augmented impact on the health of city's residents. According to the estimates, the frequency of tropical nights in the area is expected to increase the most after 2040 with 30 to 34 nights in March-May (autumn), with 35 to 64 nights in June-August (winter) and 36 to 42 nights in September-November (spring) (Fig. 4).*

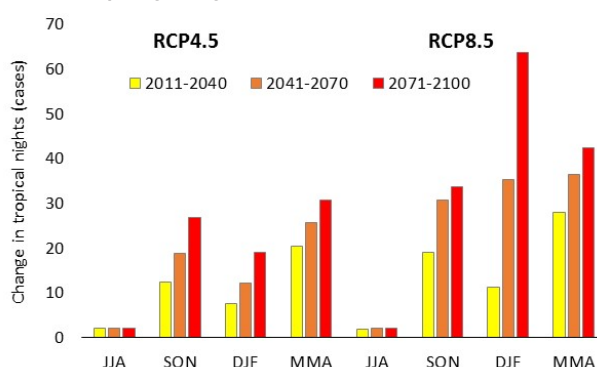


Figure 4: Change in the seasonal frequency of tropical nights in the Maputo City under different scenarios over the 21<sup>st</sup> century.

- *An increasing percentage of days when daily minimum and maximum temperatures could exceed the corresponding threshold of the 90<sup>th</sup> percentile, indicating the in the Maputo City both types of extremes (hot nights and hot days) are expected to become a more common climate feature after 2070, regardless the season.*
  - *Frequency of hot nights is expected to increase the most in the area in all seasons by 2100, suggesting a growing exposure to night-time heat stress of local population. Peak increases under both RCPs are projected in the months of the second half of the warm season in the area, overlapping the calendar winter (30-*

## Key messages

36% in the near-future, 50-64% in the mid-future and 61-84% in the far-future) and spring months (18-26% in the near-future, 40-62% in the mid-future and 55-84% in the far-future). Lowest increases are expected from September to November (spring) with 23 to 47% in RCP4.5 and 27 to 72% in RCP8.5. Over the cool season, increasing frequency of these extreme is estimated in the range of 33-50% in RCP4.5 and of 27-80% in RCP8.5.

- *Hot days are estimated to increase moderately in frequency relative to hot nights and this increase is also likely to affect all seasons. As for the previous type of extreme events, it is the December-February interval (summer) which is expected to experience the greatest increase in frequency, with 11 to 23% in the near-future, 17 to 34% in the mid-future and 23 to 55% in the far-future. Over the rest of the year, positive changes are expected to exceed 20% only in March-May (25% in the far-future) in RCP4.5 and in March-May (27 to 50% in the mid- and far-future), June-August (23 to 39% in the mid- and far-future), as well as in September-November (27% in the far-future) in RCP8.5.*

- *Growing exposure to more recurrent, intense and persistent hot weather episodes (s).*

- *Maputo City is expected to experience a significant increase in the frequency of heat waves (spells) by the end of the 21<sup>st</sup> century. Projected positive changes in the number of heat waves/season are considerable in all seasons relative to the reference period, but they are particularly large during December-February (summer) and March-May (autumn) (with up to 4 days in RCP4.5 and 19 days in RCP8.5, after 2070), overlapping the second half of the warm season. The June-August interval (winter) is also expected to be affected by an increasing frequency of heat spells, but with a lower magnitude of change signal compared to December-February and March-May (with up to 1.5 days in RCP4.5 and up to 11 days in RCP8.5, by the end of the century). In September-November (spring), positive changes are the weakest, as they are estimated to reach only 3 days after 2070, in the worst case scenario (RCP8.5) (Fig. 5).*

# Key messages

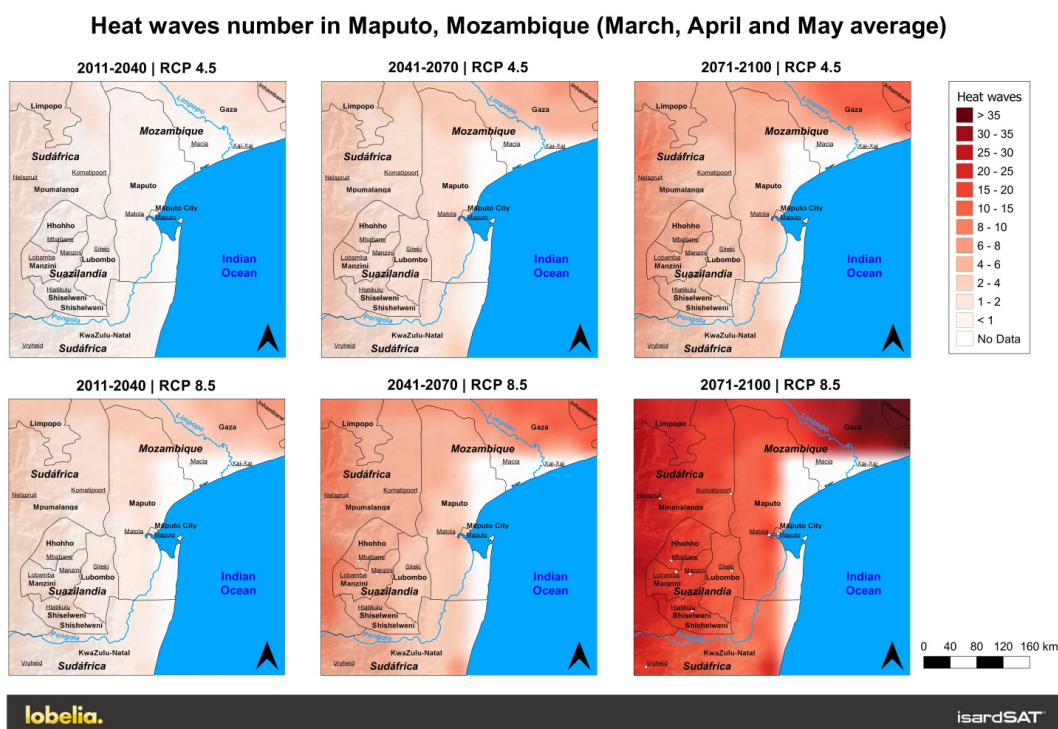


Figure 5. Spatial patterns of change in heat wave frequency over March-May interval in the area of Maputo City, by 2100, under RCP4.5 (upper graphs) and RCP8.5 (lower graphs).

- The projections suggest a *lengthening of periods affected such extremes in the area*. Positive changes in this heat wave characteristic are suggestive for a growing exposure to bioclimatic heat stress given the high relative humidity levels in the area all over the year. Maputo City is expected to be affected by longer heat waves/heat spells in the same months when the frequency of such extremes is likely to increase the most, namely: in December-February (with up to 3-5 days under RCP4.5 and 6-12 days under RCP8.5, after 2040) and March-May (with 3-4 days in RCP4.5 and with 6-12 days under RCP8.5, also after 2040). Projected changes in the duration of extreme heat events during the calendar June-August months (winter) are more important despite their smaller change in frequency, suggesting that such extremes are expected to become longer also during the cool season, with up to 3 days in RCP4.5 and 9 days in RCP8.5, after 2070.
- Intensity of heat waves is also projected to increase in the Maputo area. Under the moderate climate scenario (RCP4.5), especially after 2070, there will be increments in March-May (with 1.5 °C) and June-August (with 3 °C). Under RCP8.5, heat waves in the area are projected to become also more extreme in



# Key messages

terms of intensity, in all seasons. For example, in winter (June-August), the projected increase in the intensity of such extremes after 2070 is up to 3.7°C.

- *Increasing exposure to diurnal heat stress associated to the rise of record minimum and maximum temperatures throughout the year.*
  - *In line with the projected intensified warming, the record minimum temperatures are on a visible increase in all months of the year, especially after 2040, under both RCPs. In the moderate climate change scenario (RCP4.5), largest positive changes are expected in June (4.2°C in the far-future), March (2.5 to 3.1°C in the mid- and far-future) and January (2.9°C only in the far-future). However, some decreases have been also projected by 2040 for the Maputo area in July (0.9°C), September (0.6°C) and October (1.3°C). Under the worst case scenario (RCP8.5), projected positive changes are substantial, mostly after 2070, exceeding 4.0°C in most months (except July and October) or even 5°C in January (5.3°C), March (6.4°C), June (6.1°C) and November (6.6°C).*
  - *Record maximum temperatures are projected to increase at slightly lower magnitudes, but still suggestive for augmentation of heat stress. Under RCP4.5, projected changes are dominantly positive in all future time-intervals, except those estimated on near-term (2011-2040), in January-February (0.6-1.4°C), April and September (below 0.5°C). Peak increases are expected in the far-future, especially in June (with up to 4.6°C), December (4.2°C) and May (3.4°C). In RCP8.5, the increasing signal is visibly intensified throughout the year, reaching peak magnitudes of over 5°C after 2070, in February, March, May and August.*

*Persistent cold weather events in the Maputo area are uncommon extremes under the present-day climate conditions and they are expected to become even rarer by 2100. In RCP8.5, such extremes are projected to disappear from the area after 2070 in most seasons (except autumn). The duration of cold waves (spells) is projected to decrease significantly in all seasons (especially in summer and winter months), with 69 to 80% in RCP4.5 and with 70 to 81% in RCP8.5 in the near-future, with 77 to 91% in RCP4.5 and 88 to 97% in RCP8.5 in the mid-future and with 85 to 99% in RCP4.5 and 98 to 100% in RCP8.5 in the far-future.*

## 2.2 Precipitation-based extremes

- *The downscaled climate model indicate that under the warmer climate the Maputo area is projected to experience an increase in the frequency of heavy and very heavy precipitation days as follows:*



# Key messages

- In RCP4.5: the increase is expected in December-February (in the mid- and far-future) with 3 to 7%, but especially in June-August (in the near- and mid-future) with 6 to 43% in the case of heavy precipitation days. Exceptionally, the very heavy precipitation days are expected to become a common feature of the Maputo climate in June-August (400% in the mid-future), September-November (in all future time intervals, but especially after 2040, with an increase of 29 to 38%), but also in March-May (about 2%, in the far-future). The projected changes for the other seasons have an opposite sign, with peak magnitudes of 20-29% in spring by 2040, for both types of extreme precipitation days.
- In RCP8.5: in the case of heavy precipitation days, the increase is expected only in winter, from June to August (11 to 30%, in all future time-intervals) and spring, from September to November (up to 4%, in the near- and mid-future). The positive signal associated to these seasons becomes stronger in the case of very heavy precipitation days, indicating an outstanding increase of over 100% in winter (June-August), in all future time-intervals (exceeding 300% after 2070) and of 12 to 50% in spring (September-November), in the near- and mid-future intervals.
- The aforementioned change signal in precipitation extremes is in line with the projected future variability of the greatest one-day precipitation under RCP4.5, which indicates an increase in July (with 39% on mid-term) and August (from 30 to 77%, in all future time-intervals), as well as in September (with up to 25% in the mid-future) and October (42 to 78% in the mid- and far-future). It is also important to mention that this climate extreme indicator is also on a slight increase (5 to 17%) in December and January by 2040 and at the end of the warm season (in March), with 38%, after 2070. In the rest of the year, the projections suggest a significant decrease in this indicator, with peak magnitudes in January (56% in the mid-future) and February (up to 53% in all future time-intervals, but especially after 2070). Under RCP8.5, projected negative changes in the greatest one-day precipitation are expected to be prevalent throughout the year, becoming more important in terms of magnitude, especially in January and February. Positive changes maintain in July and August, with 43 to 55% in the far-future), in September, with 15-22% in the mid- and far-future and in October, with 14 to 36% in all future time-intervals and to a smaller magnitude in December (12% in the far-future) and May (11% in the near-future).
- In rows of five consecutive days, under RCP4.5, maximum precipitation is expected to increase slightly in January-March (with less than 10%), moderately in June (12 to 16% in the mid- and far-future) and more significantly in May (52% in the mid-future),

# Key messages

November and December (54 to 58% in the far-future and near-future, respectively). A substantial decrease in this indicator is projected for the rest of the months, especially in April (66 to 76% in all future intervals) and August (58-60% in the near- and mid-future). Under RCP8.5, the change patterns are common with those estimated under RCP4.5, but they are more intensified as follows: the increase in the maximum five-day precipitation is very significant in May (190% in the near-future), October (169% in the mid-future) and December (108% in the far-future) and rather moderate in February and March (about 29%, especially in the near-future); projected negative change is prevalent all over the year, indicating important changes relative to present-day conditions (over 50%) especially in August, September and April.

- Monthly precipitation totals exceeding the 95<sup>th</sup> percentile of daily precipitation suggest an intensification of wetness in the Maputo area especially in January (RCP4.5), October (RCP4.5) and November (RCP8.5). An opposite signal have been projected in April, and especially in July and August.

- Wet spells in the area of Maputo are tending to increase in frequency only in December-February (19 to 34% in the near- and mid-future) and March-May (with 69% in the far-future) under RCP4.5, as well as in September-November (but very slightly, in the mid-future and far-future, respectively), March-May (with 1 to 38%, in all future time-intervals) and in June-August (with 24% in the near-future) in RCP8.5. In terms of duration, wet spells show an increase in summer (December-February), winter (June-August) and spring (September-November) (22 to 33% in the mid-future) in RCP4.5 and in summer (17% in the near-future), winter (33 to 44% in the near- and mid-future) and spring (56% in the mid-future) in RCP8.5.

- Future trends towards a greater wetness in summer (December-February), winter (June-August) and spring (September-November) both RCPs (in the mid-future under RCP4.5 and mid- and near-future under RCP8.5) is supported also by the projected changes in the number of consecutive wet days.

- Increasing temperature is expected to intensify also the effects of dryness in the area of Maputo over some distinct intervals throughout the year and future time-intervals, that could be considered a potential response to longer and more frequent heat waves:

- The number of consecutive dry days is projected to increase in summer (with 30 to 38% in the near- and mid-future) under RCP4.5 and in summer (about 30% in

# Key messages

the mid-future) and autumn (with 46% in the far-future) under RCP8.5. For the other seasons and future time-intervals, this indicator is on a visible decrease especially in summer (with peak decreases of 53 to 56% in the mid-future, under both RCPs).

- The number of dry spells is projected to increase in all seasons, showing differences in the magnitude of change signal between the future time-intervals and selected RCPs: in RCP4.5 - December-February (11% in the mid-future), March-May (2 to 8% in the near- and mid-future) and September-November (1 to 9% in the mid- and far-future); in RCP8.5 - in December-February (1 to 22% in all future time-intervals), March-May (1 to 4% in the mid- and far-future), June-August (up to 2% in the mid-future) and September-November (7 to 11% in all future time-intervals).
- Overall, projected changes in future precipitation extremes in the Maputo area over the 21<sup>st</sup> century are rather inconclusive, due to the mixed change signals (both increases and decreases being expected).

## 3 Expected impacts and vulnerabilities

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- The intensified warming of local climate by the end of the 21<sup>st</sup> century, is likely to maintain or to exacerbate the current exposure of the Maputo area to episodic inland flooding and destructive cyclones, caused by the expected increasing capacity of the warmer atmosphere to hold more moisture and to become saturated.
- The Maputo City is already highly vulnerable to sea level rise and coastal erosion under the present-day climate. Projected changes in precipitation intensity and precipitation extremes towards a greater wetness in the area is expected to result into a greater exposure to floods (part of it due to the precipitation associated to cyclones), especially during the months of the rainy season (overlapping summer months). Associated to the effects of future sea level rise, coastal erosion and salinization of shallow coastal groundwater and soils in arable lands are processes likely to intensify in the area.

# Key messages

- The intensified warming and the changing patterns in temperature and precipitation extremes is expected to affect water availability and food security in the area, through perturbations of harvest cycles of major crops, reduced recharge water capacity of agricultural soils, increased water demand for irrigations, but also agricultural land degradation induced by erosion and floods, in relation to the growing frequency of hot extremes (tropical nights, heat waves), heavy and very heavy precipitation days and higher evapotranspiration.
- Projected temperature increase in the Maputo City is likely to exacerbate also health risks associated to heat stress.

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# Annex VI

# **Local Government and Stakeholders Analysis**





## List of figures

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- Figure 1** Organisational Chart of the Municipality of Maputo. Source: Maputo Municipality (2018)
- Figure 2** Stakeholder Map for Built Environment. Source: CRPT (2019)
- Figure 3** Stakeholder Map for Supply Chain and Logistics. Source: CRPT (2019)
- Figure 4** Stakeholder Map for Basic Infrastructure. Source: CRPT (2019)
- Figure 5** Stakeholder Map for Mobility. Source: CRPT (2019)
- Figure 6** Stakeholder Map for Municipal Public Services. Source: CRPT (2019)
- Figure 7** Stakeholder Map for Social Inclusion and Protection. Source: CRPT (2019)
- Figure 8** Stakeholder Map for Economy. Source: CRPT (2019)
- Figure 9** Stakeholder Map for Ecology. Source: CRPT (2019)
- Figure 10** Stakeholder Map for Risk Reduction Measures on Floods, Cyclones and Droughts. Source: CRPT (2019)
- Figure 11** Stakeholder Map for Risk Reduction Measures on Malaria. Source: CRPT (2019)
- Figure 12** Stakeholder Map for Risk Reduction Measures on Heat Wave. Source: CRPT (2019)

## List of acronyms and abbreviations

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<b>A4R</b>	Actions for Resilience
<b>AfDB</b>	African Development Bank
<b>AMB</b>	Barcelona Metropolitan Agency
<b>AMT</b>	Metropolitan Transportation Agency
<b>AP</b>	Associations of Producers
<b>BEN</b>	Built Environment (Urban Element)
<b>BIN</b>	Basic Infrastructure (Urban Element)
<b>CMM</b>	Maputo Municipality
<b>CENOE</b>	National Emergency Operations Centre
<b>CERUM</b>	Multiple Uses and Resources Centres
<b>CRPP</b>	City Resilience Profiling Programme
<b>CRPT</b>	City Resilience Profiling Tool
<b>DFID</b>	United Kingdom Department for International Development
<b>DRR</b>	Disaster Risk Reduction
<b>EdM</b>	Electricity of Moçambique
<b>EU</b>	European Union
<b>ECL</b>	Ecology (Urban Element)
<b>ECN</b>	Economy (Urban Element)
<b>FAO</b>	Food and Agriculture Organization
<b>FFH</b>	Fund for Housing Development
<b>FIPAG</b>	Investment Fund and Heritage of Water Supply
<b>GIZ</b>	Gesellschaft für Internationale Zusammenarbeit
<b>ICLEI</b>	Local Governments for Sustainability
<b>IGRAC</b>	International Groundwater Resource Assessment Centre
<b>INAM</b>	National Institute of Meteorology
<b>INGC</b>	National Institute of Disaster Management
<b>JICA</b>	Japanese International Cooperation Agency
<b>MAEFP</b>	Ministry of State Administration and Public Functions
<b>MEF</b>	Ministry of Economy and Finance
<b>MITADER</b>	Ministry of Land, Environment and Rural Development
<b>MINEDH</b>	Ministry of Education and Human Development
<b>MISAU</b>	Ministry of Health
<b>MOB</b>	Mobility (Urban Element)
<b>MOPHRH</b>	Ministry of Public Works, Housing and Water Resources
<b>MPS</b>	Municipal Public Services (Urban Element)

## List of acronyms and abbreviations

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<b>PEUMM</b>	Urban Master Plan of Maputo Municipality
<b>RAR -S</b>	Recommendations for Actions for Resilience and Sustainability
<b>RR</b>	Risk Reduction
<b>SIDA</b>	Swedish International Development Cooperation Agenc
<b>SCL</b>	Supply Chain and Logistics (Urban Element)
<b>SIP</b>	Supply Chain and Logistics (Urban Element)
<b>UNAPROC</b>	National Civil Protection Units
<b>UN / ONU</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UN-Habitat</b>	United Nations Human Settlements Programme
<b>WB</b>	World Bank / Banco Mundia
<b>WFP</b>	World Food Programme

# Annex VI

## Local Government and Stakeholders Analysis

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This section provides a multi-level cross-cutting analysis of governance processes in the city while considering a broad variety of interactions among relevant stakeholders. It brings together all the relevant information in the CRPT that facilitates a better understanding of the urban system as a whole from a governance perspective. The Local Government, as UN-Habitat's main counterpart in the CRPT and a city's main stakeholder charged with delivering quality services for all its inhabitants, constitutes the backbone for analysing governance.

The purpose of this analysis is to better inform Actions for Resilience (A4R) of the concrete realities on the ground, through a comprehensive analysis of the actors working actively in different aspects of the urban system. It considers the full picture of local government including decision-making, implementation and planning processes, and extensive stakeholders mapping which attempts to capture the interactions and influences among the relevant actors.

### 1. Local Government

This section aims to examine the structure, roles, and responsibilities of the local government, in this case Maputo Municipality, to understand how it can effectively work towards building resilience. It provides contextual information such as the place of the local government in the overall government structure, its internal structure, and its competencies, including budgeting processes. As the first point of contact between the city's inhabitants and the government, it sets the stage for further analysis of the local government's relationship with stakeholders mapped in different aspects of the urban system, as well as those related to risk reduction measures.

The data collection and analysis period concluded in early 2019. Since then, the local government has been undergoing significant structural changes. While the analysis provided herein pertains to the previous local government structure, understanding its functions, strengths and challenges provide valuable insights for the new structure.

#### Local Government: Organisational Structure

The Government of Mozambique, through the Ministry of State Administration and Public Administration, has been progressively implementing a decentralization process to transfer the central government's political and financial responsibilities to municipalities. This decentralization aims to ensure the provision of adequate public services, involving the participation of communities in the decision-making process, where accountability is one of the key factors for success.

Since November 1998, the Municipality of Maputo has been run by a Municipal Council, a collegial executive body constituted by a democratically elected President for a term of five years and by 15 councillors appointed by the President. The government is monitored by a Municipal Assembly, composed of councilmen also elected by direct vote. Prior to this date the city was run by an Executive Council appointed by the central government.

Prior to the structural changes currently in process in the municipality, the previous local government was composed of 17 Municipal Councils, 9 Municipal Cabinets, 12 Municipal Directorates, 28 Municipal Departments and 11 Municipal Repartitions. The overall objective of these entities is to focus on growing municipal economy and to provide infrastructure and services to those living under their jurisdiction.

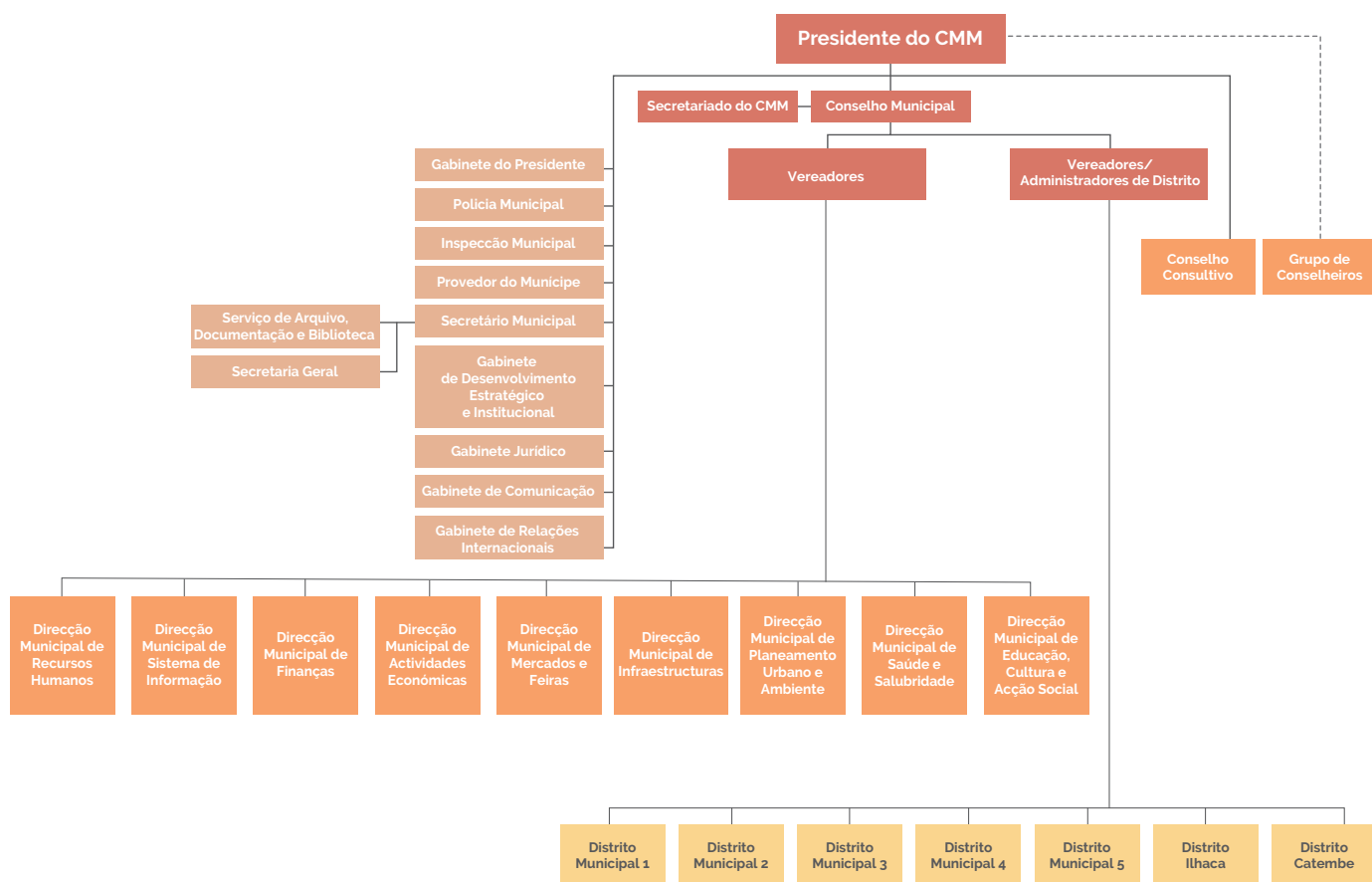


Figure 1: . Organisational Chart of the Municipality of Maputo. Source: Maputo Municipality (2018).

## Local Government: Responsibilities and Competencies

The Municipality of Maputo is organized through the following directorates: President's Office; Economic Activities; Education, Culture and Social Action; Finance; Infrastructure; Market and Trade Shows; Urban Planning and Environment; Human Resources; Health and Health and Information Systems.

### The main responsibilities of the Municipal Directorates are:

- To intervene in services of the Municipal Council or others of public services, through the monitoring of its activities, understanding of problems and bottlenecks, the impact of the action and the expectations of the demand, aiming at contributing to its improvement;
- To interact with the municipal society organized in its diverse economic, social and cultural activities in order to understand the problems, expectations and priorities, working with the community, parties and society in general;
- Exercise the direct action of administrative superintendence with the Directorates or Municipal Districts, by incumbency and representation of the President of the Municipal Council;
- Contribute, individually and as a member of the Municipal City Council to the evaluation of the business plans and the monitoring of their execution.

## Local Government: Budget Competencies

The Municipality of Maputo has its own budget, prepared and managed according to the principles of the State Budget. Municipalities harmonize their financial regime with the general and financial principles and assets in force for the General State Budget, in order to ensure the application of national accounting standards. Revenue from Municipalities is classified by its nature, in terms of capital and depending on its origin, is either own or sub-conventional nature.

### Current revenues are:

- The proceeds from the collection of taxes of an eminently municipal nature already existing or that may be created;
- A percentage of certain taxes levied by the state, under the terms to be defined by Law;
- The integral product of collection of fees or tariffs resulting from the provision of services or licensing by the local authority;
- The product of penalties that may be imposed on local authorities by law, regulation or position;
- The product of inheritances, legacies, donations other liberalities

### Own capital revenues include:

- The income from the services of the local authority, which it administers or grants;
- Income from own, movable or immovable property;
- The income from financial partitions;
- The product of alienation of patrimonial and own assets;
- The product of loans contracted by the local authority;
- The product of inheritances, legacies, donations and other liberal charities on specific investments

## 2. Stakeholders

Stakeholders are entities (groups or individuals) that can affect or be affected by changes in the city, and act with varying roles and responsibilities in the urban system. A conscious effort to create a comprehensive map of these actors was undertaken as part of the CRPT implementation through collecting information on each stakeholder's type, responsibilities towards specific aspects of the urban system (Urban Elements or potential shocks), and relationships with the local government and other stakeholders.

**Types of stakeholders include:**

- Local Government: as the partner institute, should be analysed in all Urban Elements
- Public Sector Entities: relevant sub-local, local, supra-local (e.g., region, district, province) and national government entities or departments
- Private Sector Entities: for-profit enterprises, companies or businesses (e.g., service providers, industry, commerce, financial and private research institutions), from the local to the international level
- Civil Society Entities: civil society organisations (e.g. neighbourhood and cultural associations, indigenous groups, charitable and local non-governmental organisations), traditional and community councils, amongst others
- Other Major Institutions: non-governmental foundations, organisations, academia, financial institutions, and public-private consortiums; multilateral organisations (e.g. United Nations); international government unions (e.g. European Union) and other intergovernmental associations or communities (e.g. African Union)

The main objective of this mapping and analysis is to identify key stakeholders in resilience-building as a mechanism to improve the overall understanding regarding their role on the resilience-based sustainable development for the city. It aims to identify the gaps and improve their coordination, in order to avoid redundancy of efforts and create synergies among them. With the support of the local government, this mapping process was conducted by reviewing existing project documents, identifying a list of stakeholders, and engaging them through the analysis and data collection of the Urban Elements and the risk reduction measures. Several technical workshops and different meetings have been organized to assess and validate the data. Moreover, representatives of key stakeholder groups were invited to the technical workshops, which were used to identify the stakeholders' roles within the specific aspects considered, benefits and values they receive. Data obtained from these technical workshops, meetings and review of documents led to the mapping of key stakeholders.

To better understand stakeholder interactions and how these may impact the resilience of the city, stakeholders were analysed per aspect of the urban system (Urban Element or potential risks) considering the following:

- Classification of stakeholder as essential or complementary for resilience, based on the analysis of effective interactions between them and the local government from a resilience perspective. In this analysis, three criteria were taken into consideration: stakeholders' interest, power, and resources in order to act for resilience together with the Local Government.
  - Essential stakeholders for resilience, are directly linked to the local government through formal and close relationships.
  - Complementary stakeholders for resilience may not always be directly related to the local government, despite being able to influence and be influenced by its operation and outcomes.
- Identification of local government entities involved
- Assessment of how stakeholders influence the local government
- Assessment of what the Local Government needs from the stakeholders to effectively perform their functions
- Stakeholders relationship with other Urban Elements / Risk Reduction Measures for prioritised shocks

For the purpose of this analysis, 134 stakeholders organised among the eight Urban Elements and Risk Reduction Measures were identified. This includes 87 stakeholders at the national level, 16 stakeholders at the municipal level, and 31 stakeholders at the international level. A number of these stakeholders were consulted during the data collection process in order to support this mapping and analysis.

### 3. Stakeholders by Urban Elements

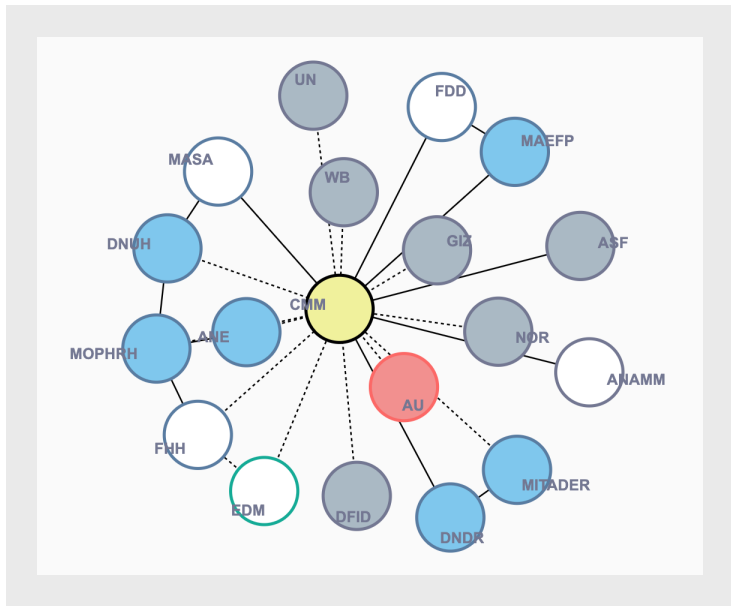
This section presents stakeholders analysis per Urban Element (explored further in Annex III. Urban Performance Overview) and provides findings and possible proposals for addressing the exposed issues in order to support resilience-building actions by the local government.

Built Environment (BEN)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Fundo Municipal de Planeamento Urbano e Ambiente</li> <li>• Pelouro do Planeamento Urbano e Ambiente</li> <li>• Direção Municipal de Planeamento Urbano e Ambiente</li> <li>• Repartição de Assentamentos Informais</li> </ul>
<b>How stakeholders influence the local government</b>	<p>In this element, the stakeholders mainly influence the Local Government in policy formulations, development and planning. For instance, The Urban Master Plan of Maputo City (Plano de Estrutura Urbana da Cidade de Maputo) was developed under the City Development Programme funded by the World Bank and counted with the support of GIZ and the DFID. The Ministry of Public Works (Ministério das Obras Públicas) supports the local government in identifying priorities for the City Urban Planning in terms of policy revision, governance and awareness raising for law enforcement and application.</p>
<b>What the local government needs from these stakeholders</b>	<p>The Local Government needs to strengthen the existent coordination mechanisms and manage to bring all the stakeholders from the early stage of planning to the implementation. This can be achieved through a robust stakeholders mapping followed by a strong communication platform, which so far is still weak within the sphere of the stakeholders, either essential or complementary. The Local Government should also count on the stakeholders to support the reporting, evaluation and monitoring mechanisms followed by accountability and transparency, as these are the most concerning issues of the Local Government, not only regarding this element but others like BIN, SIP and MPS.</p>
<b>Stakeholders relationship with other Urban Elements</b>	<p>The Built Environment stakeholders happen to be the same acting with the Local Government in other elements that deals with service provision (such as BIM, MPS and SIP). For instance, the Ministry of Public Function (Ministério da Função Pública) also plays a primary role for the Municipal Public Services ensuring good administration boards, processes and mechanisms while also responding for the Municipalities in terms of policy formulation. Although directly related to the BIN, the FFH (Fundo para o Fomento de Habitação) is one of the key actoractors for BEN as it acts under the umbrella of the available and recommended land for building new housing. Moreover, thinking about the access to the basic services in relation to the land use plans and basic infrastructures regulations and norms, this demonstrates how these elements are so correlated and hence its relevant stakeholders must keep an efficient communication.</p>



- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

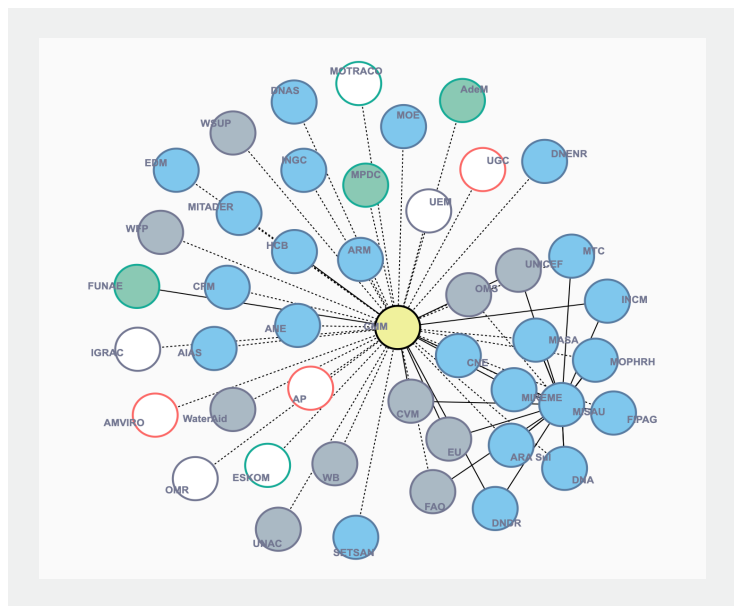
- Formal Partnership
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**Figure 2:** Stakeholder Map for Built Environment. Source: CRPT (2019).

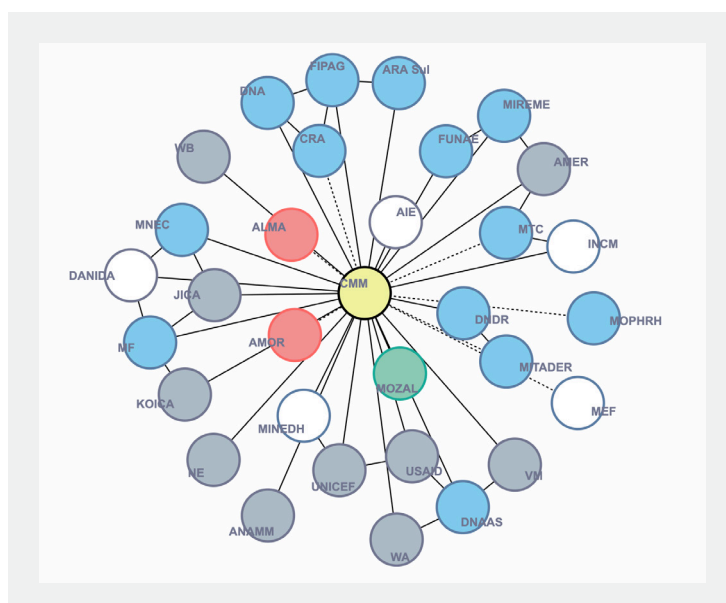
Supply Chain and Logistics (SCL)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Direção Municipal de Actividades Económicas</li> <li>• Pelouro de Actividades Económicas</li> </ul>
<b>How stakeholders influence the local government</b>	In the Supply Chain & Logistics (SCL) element, the essential stakeholders mainly provide key services (like energy and water resources and goods transportation) to the local government that in this way is highly dependent on them in order to provide an adequate service to the citizens.
<b>What the local government needs from these stakeholders</b>	In SCL, stakeholders are often involved in services provision as well as in the quality evaluation of the services provided, through institutions such as the International Groundwater Resource Assessment Centre (IGRAC), Food and Agriculture Organisation (FAO) and Associações dos Produtores (AP), among others. What the government needs is to have a quality provision services and support in monitoring and maintenance of the same.
<b>Stakeholders relationship with other Urban Elements</b>	SCL is an element that has many points of contact with other elements, like BIN, concerning energy and water. This is the reason why many stakeholders act and influence both fields, especially public ones, such as Instituto Nacional de Gestão de Calamidades (INGC), Direcção de Água e Saneamento, Ministério das Obras Públicas, Habitação e Recursos Hídricos (MOPHRH), and other private institutions (e.g. Fundo de Investimento e Património do Abastecimento de Água - FIPAG, Electricidade de Moçambique - EdM)

- Public Entity
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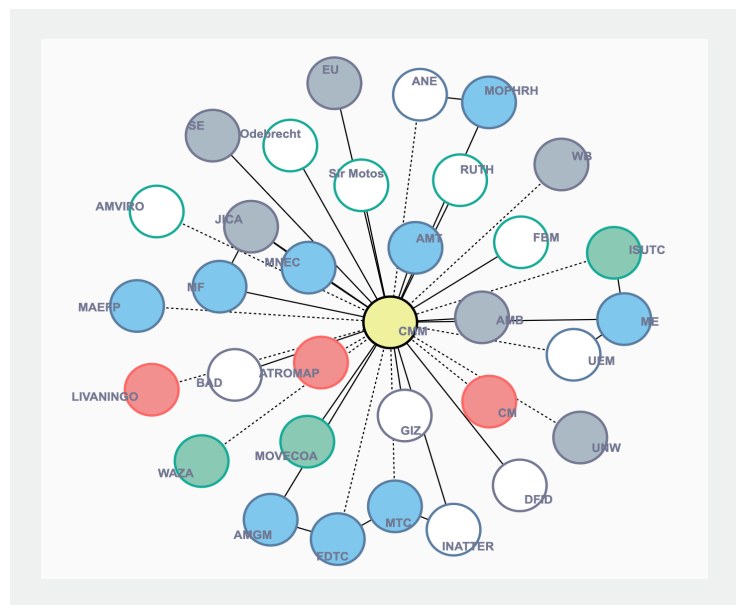
**Figure 3:** Stakeholder Map for Supply Chain and Logistics.  
Source: CRPT (2019).

Basic Infrastructure (BIN)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Direção Municipal de Infraestruturas</li> <li>• Direção Municipal de Gestão de Resíduos Sólidos e Salubridade</li> <li>• Direção Municipal de Saúde e Salubridade</li> </ul>
<b>How stakeholders influence the local government</b>	<p>Under the Basic Infrastructure (BIN) element, essential stakeholders provide key services on energy, water, sanitation and communication, including solid waste management. This is a vast element comprised of several components; however, the number of stakeholders involved is not that high considering the scope of the element. The major role of the stakeholders in this element towards the Local Government relies on provision of resources for activity implementation, technical assistance to the government as well as capacity building. There is still lack of support for accountability and transparency mechanisms as well as integrated coordination between the stakeholders and local government when it comes to plans implementation, evidenced by existence of local government plans that have not been implemented.</p>
<b>What the local government needs from these stakeholders</b>	<p>The Local Government needs to strengthen an integrated approach among the various stakeholders and avoid redundancy of efforts while allocating resources. Involvement of the stakeholders in the municipal planning cycle is necessary, as sometimes the stakeholders do not follow the planning framework but their own priorities towards municipal development.</p>
<b>Stakeholders relationship with other Urban Elements</b>	<p>The vast range of components involved in Basic Infrastructure makes it difficult to put all the stakeholders involved together in a same platform for communication, planning, coordination and joint action. Stakeholders such as Electricidade de Moçambique (EDM), responsible for energy provision, must interact with other elements such as Urban Mobility and Built Environment. Moreover, BIN is directly related to MPS and SIP in a sense that its services provision is important for the functioning of the city in its physical, environmental and social sphere. As such, it is possible to assume that the stakeholders involved and acting with the Local Government on BIN should also manage to interact together on BEN, SIP, MPS, as well as SCL.</p>



**Figure 4:** Stakeholder Map for Basic Infrastructure. Source: CRPT (2019).

Mobility (MOB)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Pelouro de Transportes e Comunicação do Conselho Municipal</li> <li>• Direção Municipal de Transportes de Maputo</li> </ul>
<b>How stakeholders influence the local government</b>	In Mobility, the stakeholders are able to influence the Local Government by working directly with them in supporting the planning and budgeting, implementing projects and mobilizing resources. The stakeholders are also committed with capacity building of the local government in order to ensure high efficiency in management of resources which most of the time are poorly managed due to lack capacity.
<b>What the local government needs from these stakeholders</b>	While the involvement of the stakeholders is strong in what regards the provision of services, planning and capacity building, the Local Government needs to increase the level of engagement of the essential stakeholders mainly to support accountability and transparency.
<b>Stakeholders relationship with other Urban Elements</b>	The essential stakeholders such as JICA, WB, AMB (Agência Metropolitana de Barcelona), and AMT (Agência Metropolitana de Transportes), include donors that also play important role in other urban Urban elements Elements such like Built Environment, SIP and BIBasic Infrastructure. The complementary stakeholders should coordinate more with the Local Government and other stakeholders in other elements such as built Built environment Environment and basic Basic infrastructure Infrastructure as the interventions in mobility mobility affect issues related for example with solid waste management and land use planning. This is case for example of GIZ, DFID and AfDB that work with the Municipality in addressing mobility development and also have other interventions in other areas above mentioned.

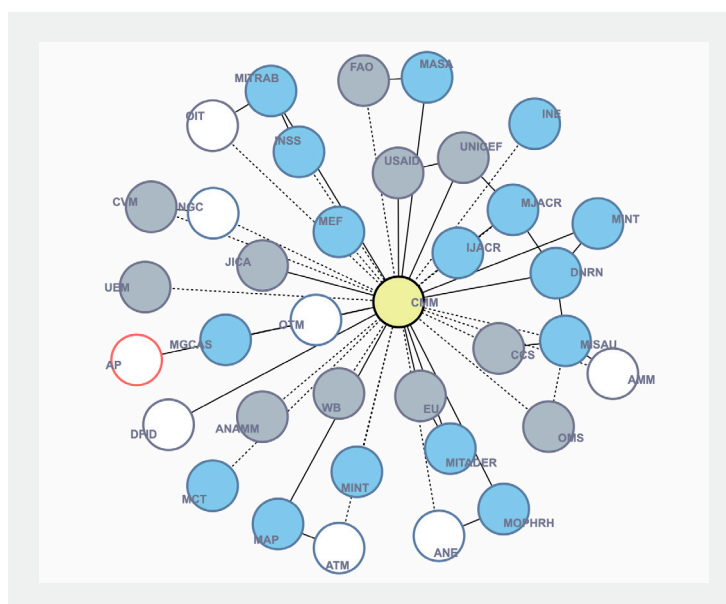


**Figure 5: Stakeholder Map for Mobility.**  
Source: CRPT (2019).

Municipal Public Services (MPS)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Conselho Municipal de Maputo</li> <li>• Direcção Municipal de Gestão de Resíduos Sólidos Urbanos e Cemitérios</li> <li>• Direcção Municipal de Actividades Económicas</li> <li>• Direcção Municipal de Mercados e Feiras</li> <li>• Direcção Municipal de Saúde e Acção Social</li> <li>• Direcção de Saúde da cidade de Maputo</li> <li>• Pelouro de Desenvolvimento Económico Local</li> <li>• Pelouro de de Saúde e Acção Social</li> </ul>
<b>How stakeholders influence the local government</b>	In MPS, the vast range of stakeholders contribute to the Local Government with resources allocation and planning.
<b>What the local government needs from these stakeholders</b>	The Local Government needs support from the essential stakeholders and major institutions on ensuring coordination and accountability. Capacity building is one of the core needs of the Local Government and efforts have been undertaken with the support of the private stakeholders in order to strengthen the capacity of the local technicians and authorities in the field of MPS; however, challenges regarding management and planning are still outstanding.
<b>Stakeholders relationship with other Urban Elements</b>	It is important to take into consideration the relationship of this element with the Basic Infrastructure and Built Environment, as the services are provided at those infrastructures and so it is important to understand who are the key actors and what they do, regarding the physical assets and services, as they both need to interact together.

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
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- ..... Communicates
- ..... No Legal Engagement



**Figure 6:** Stakeholder Map for Municipal Public Services. Source: CRPT (2019).

Social Inclusion and Protection (SIP)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Pelouro da Saúde e Acção Social</li> <li>• Direcção Municipal de Saúde e Acção Social</li> </ul>
<b>How stakeholders influence the local government</b>	<p>Since this element comprises many other components like: such as education Education, social Social care Care and protection Protection, food Food security Security and health Health, it is quite challenging to understand in a consolidated approach how the stakeholders influence the local government in each of these sectors. In accordance to the actual governance structure, the Municipal Directorate of Health and Social Care (Direcção Municipal de Saúde e Assistência Social) is responsible for health, social care and food security and the various essential stakeholders are usually the providers of resources for activity implementation, technical assistance to the government as well as capacity building. In this element, those classified as complementary stakeholders do not depend on resources delivered directly, so they are only consulted and made aware of the initiative by the Local Government.</p>
<b>What the local government needs from these stakeholders</b>	<p>In this Urban Element, the Municipality deals with many different stakeholders. The Local Government therefore needs to manage relationships, through consultation, negotiation, and communication with stakeholders. More coordination with the Local Government in regarding risk reduction issues is needed, including the strengthening of communication and technical capacity of the local technicians and authorities to address disaster risks in emergency periods. There is still a limited stakeholder involvement in strategic planning and management of the activities within this Urban Element such as social care, emergency and education. The stakeholders involved in education and health need to proactively engage in Local Government planning as most of the initiatives follow within the central government even though primarily directed to the local government. For instance, MISAU (Ministry of Health/Ministério da Saúde) and MINEDH (the Ministry of Education and Human Development/Ministério da Educação e Desenvolvimento Humano) have lower influence at local level but higher influence at central level, despite being relevant to the local level when it comes to implementing actions and programmes related to these sectors.</p>
<b>Stakeholders relationship with other Urban Elements</b>	<p>The SIP stakeholders are at the centre of issues related to disaster risk management at local level, and therefore they deal constantly with the stakeholders involved with risk reduction mechanisms such as INGC (National Institute of Disaster Management/ Instituto Nacional de Gestão de Calamidades). Furthermore, it is important to take into consideration the relationship of this element with BEN and BIN, to effectively tackle basic services provision as well as the physical assets and its spatial distribution in relation to the population needs and demands. Stakeholders involved in these must be put all together in the planning process as well as evaluation and monitoring mechanisms as they finally correlate to each other.</p>



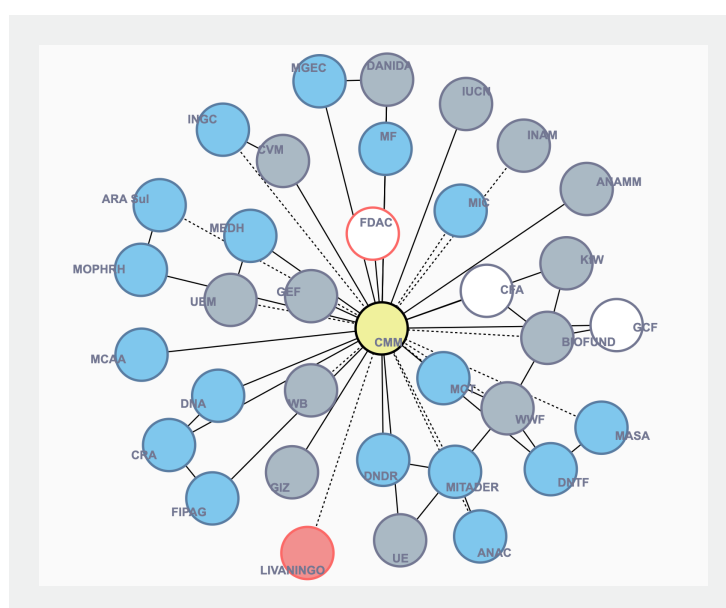




Ecology (ECL)	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Conselho Municipal de Maputo</li> <li>• Direcção Municipal de Planeamento Urbano e Ambiente</li> <li>• Direcção Municipal de Mercados e Feiras</li> <li>• Pelouro de Desenvolvimento Económico Local</li> </ul>
<b>How stakeholders influence the local government</b>	<p>In this element, the stakeholders contribute most to the implementation of related activities such as developing environmental management plans, restoring of natural ecosystems, managing natural resources, ensuring that environmental protected areas are safe and its regulation is under implementation. The stakeholders also contribute to the resources allocation, planning and capacity building in matters related to environment and climate change.</p>
<b>What the local government needs from these stakeholders</b>	<p>As similar to the other urban Urban elementsElements, the Local Government needs support from the essential stakeholders and major institutions on ensuring coordination and accountability. Capacity building is one of the core needs from the Local Government and efforts have been undertaken with the support of the private stakeholders in order to strengthen the capacity of the local technicians and authorities in the field of climate change, environmental management, disaster risk reduction, and enforcement and implementation, .of environmental regulations</p>
<b>Stakeholders relationship with other Urban Elements</b>	<p>Ecology stakeholders are closely related with the Basic Infrastructures and Built Environment stakeholders. One prime example is MITADER (Ministério da Terra, Ambiente e Desenvolvimento Rural) at which all the regulatory frameworks related to the environment at all levels (from National to Local) are developed and approved. This includes the development and approval of the City Urban Plans, in which ecology Ecology components are taken into consideration. This stakeholder is crucial for both Ecology and Built Environment, but still bring to table the Basic Infrastructures in which deployment of specific ecological conditions and urban plans are taken into consideration.</p>

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

- Formal Partnership
- Legally Engages
- ..... Communicates
- No Legal Engagement



**Figure 9:** Stakeholder Map for Ecology.  
Source: CRPT (2019).

## 4. Stakeholders involved in Risk Reduction

Similar to the Urban Elements, analysing the relationships among different stakeholders involved in the potential risks and the associated Risk Reduction Measures present in the city (explored in Annex II Shocks Analysis) is essential for proposing recommendations that can address how to prepare and respond to different shocks to which the city is exposed.

Floods, Cyclones and Droughts	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Direcção Municipal de Planeamento Urbano e Ambiente</li> <li>• Direcção Municipal de Saúde e Salubridade</li> </ul>
<b>How stakeholders influence the local government</b>	<p>The majority of stakeholders involved in Disaster Risk Reduction (DRR) in Maputo are public stakeholders, mainly belonging to the national government. The main national stakeholder involved in Risk Reduction of natural hazards and man-made ones is the National Institute of Disaster Management (INGC). Operating under the Ministry of State Administration (MAE), INGC is concerned with coordinating emergencies, promoting disaster prevention through population and government mobilization, protecting human lives, ensuring multi-sectoral coordination in disaster emergency, coordinating early warning systems, and carrying out public awareness activities on national, regional and district level.</p> <p>INGC has multiple regional operation arms known as CENOE(s) (Centro Nacional Operativo de Emergência) focusing on flood, cyclones and drought. Whereas, on district level, CERUM(s) act as the operational centres for INGC in terms of Drought events. CENOE carries out continuous data collection from different sectors and monitor plausible events. Once the estimated intensity of the plausible hazard reach certain levels, it disseminates alerts and gets activated and directed by central level when the situation exceeds the responsiveness of the provincial levels. It then works closely with UNAPROC – National Civil Protection Units. CENOE committees have normally representatives from all municipalities together with representatives from INGC and INAM (National Institute of Meteorology). These committees strategize and coordinate disaster relief response.</p> <p>While it appears that INGC through its operational arms coordinate and operate together with representatives of different levels of governance and various relevant national agencies, this coordination with the local level is limited to emergency response and disaster relief. The limited availability of data on how the INGC is cooperating with local level inhibits the comprehensive mapping of links between various levels of government when it comes to the extent to which risk reduction measures are being institutionalized across different sectors within the local government, and the level of alignment between urban plans and policies on one hand and the national strategies for disaster risk reduction.</p> <p>Data shows that financial resources and the annual funding for Contingency Plan, the Mozambican government continuously needs external financial support from other governments and donors (e.g. World Bank), especially to deal with recovery in the aftermath of disasters.</p>

**What the local government needs from these stakeholders**

The national government plays a primary role in responding to events and challenges that exceed the local governments' capacities, particularly during the phases of emergency response and disaster relief. Nonetheless, coordination in terms of risk mitigation measures including urban development strategies and plans, between national stakeholders and Maputo's local government are highly needed. In addition to coordination efforts, support in building technical and financial capacities by the national government directed to the municipality are essential requirements to ensure the durability and effectiveness of such strategies and plans.

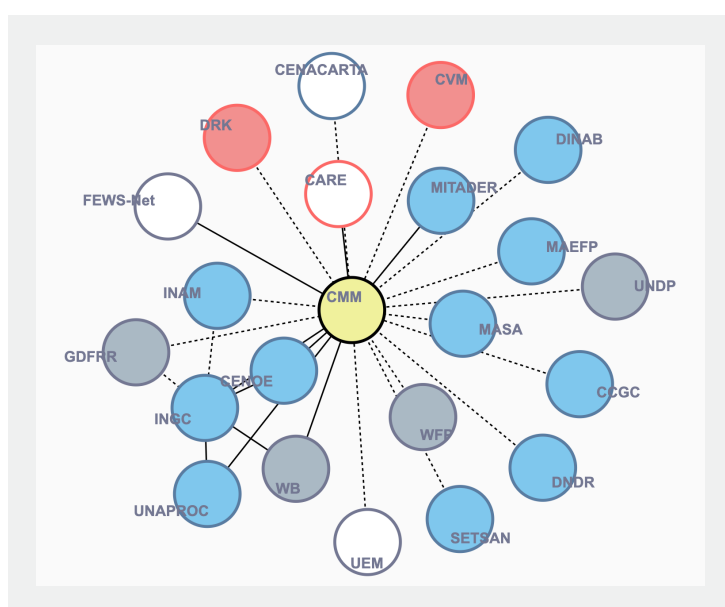
**Stakeholders relationship with other Shocks**

INGC is the national body concerned with coordinating emergencies resulting from different types of hazards including natural and man-made.

However, it appears that the existing RR measures supported by the INGC and other national bodies are closely linked with natural hazards. Besides, the donors are usually the same for the meteorological-related shocks (e.g. cyclones, droughts and floods). Nonetheless, other natural hazards such as heatwave and soil erosion have been given, relatively, less attention by these agencies and are considered minor threats.

- Public Entity
- Private Entity
- Civil Society Organization
- Other Major Institution
- Local Government

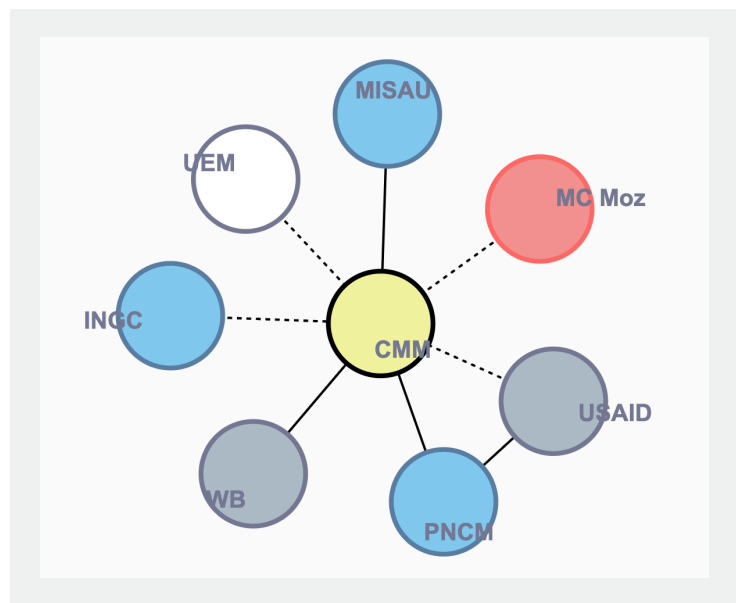
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**Figure 10:** Stakeholder Map for Risk Reduction Measures on Floods, Cyclones and Droughts. Source: CRPT (2019).

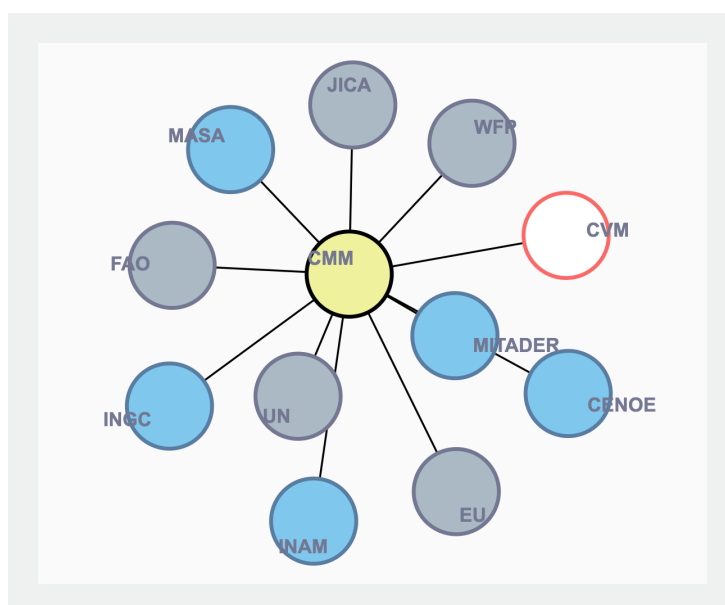
Malaria	
Key Issues	
<b>Local government entities</b>	Direcção Municipal de Saúde e Salubridade - MISAU
<b>How stakeholders influence the local government</b>	The national government organizes campaigns to defeat malaria, which are then replicated at local level by the health department within the municipality of Maputo. However, despite the numerous outbreaks of these disease, there is only limited information available on risk reduction measures in place, aimed at decreasing Malaria risk. Therefore, drawing the links between the different stakeholders involved with this type of shocks.
<b>What the local government needs from these stakeholders</b>	Despite the limited information available on malaria risk, it appears that national government is in need for the technical support of NGOs, CSOs, university and private organizations, to further study the disease and finance/provide prevention strategies. Additionally, for effective reduction of Malaria risk, a strong coordination and cooperation among stakeholders is needed horizontally (across the local government departments, especially those engaged with the provision of basic services and waste management and health department) and vertically with the different provincial and national levels of governance, with the aim of aligning and ensuring coherence across these levels.
<b>Stakeholders relationship with other Shocks</b>	On the institutional and organizational level, it appears that minor attention is given to the linkages between malaria and natural shocks like floods and cyclones. This could be attributed to the differing levels of governance, as well as different directorates, within which each shock is grappled with. It is common in Maputo, that malaria, as a water-borne disease, spreads particularly after events like floods, due to the presence of standing water among the houses and settlements combined with waste accumulation due to lack of proper waste collection and management, this results in fostering the presence of the virus and leading to disease outbreak.

- Public Entity
  - Private Entity
  - Civil Society Organization
  - Other Major Institution
  - Local Government
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- Formal Partnership
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  - No Legal Engagement



**Figure 11:** Stakeholder Map for Risk Reduction Measures on Malaria.  
Source: CRPT (2019).

Heat Wave	
Key Issues	
<b>Local government entities</b>	<ul style="list-style-type: none"> <li>• Direcção Municipal de Planeamento Urbano e Ambiente</li> <li>• Direcção Municipal de Saúde e Salubridade</li> </ul>
<b>How stakeholders influence the local government</b>	For the Heat Wave issue, stakeholders influence the local government regarding the implementation of planning tools, and development policies. There are tools as Director Plan for Disaster Risk Reduction (Plano Director para a Redução do Risco de Desastres), or National Strategy for Climate Change Adaptation (Estratégia Nacional de Adaptação as Mudanças Climáticas), which address potential threats due to Climate Change.
<b>What the local government needs from these stakeholders</b>	Local Government needs to increase internal and external communication and coordination in matters related to risk reduction measures, particularly those concerning risk assessment and monitoring climate change projection. There is also the need to invest in capacity building within the Local Government structures to develop related activities in a more efficient manner with other stakeholders.
<b>Stakeholders relationship with other Shocks</b>	Whereas Heat heat Waves waves have direct and indirect impacts on a number of urban Urban elements Elements such as Municipal Public Services, Social Inclusion and Protection and Ecology, its effects are exacerbated by the low performance (vulnerability) of some other urban Urban elements Elements such as Built Environment and Mobility, as well as other hazardous events such as Droughtsdroughts. there exists certain levels of coordination among National Government (INGC, INAM, CENOE) who have the competence to act on some aspects within certain urban Urban elements Elements with the aim of risk management and emergency response. In addition, there are private stakeholders, including donors, as JICA, UE, ONU, FAO and WFP.



**Figure 12:** Stakeholder Map for Risk Reduction Measures on Heat Wave. Source: CRPT (2019).

## Key Findings

- The Local Government and the National Government remain highly connected despite the existence of decentralization policies, which consider the Local Government (Municipalities) as autonomous bodies. As such, part of the Municipal budget (20%) comes from the contribution of the National Government. However, this relationship is more reflected at the policy level, which proposes very limited practical implementation and planning competencies at local level.
- There is significant influence and participation of major institutions in the Municipal Development, among which include development and cooperation partners such as the WB, AfDB, Embassies and United Nations.
- While many of the stakeholders were directly linked to the Municipality, the lack of an effective coordination among the stakeholders acting at Municipal Level was a main source of disruptions for sustainable management of funds allocated to implement several initiatives as well as redundancy of interventions and roles. There is a significant need for strengthened coordination among the stakeholders and reinforcement of communication.
- In general, data on the role of stakeholders in risk reduction and the interlinkages between them are limited. Available data, however, indicate relatively dominating roles by national agencies and bodies in developing and implementing Risk Reduction Measures and strategies. Nevertheless, in comparison with efforts given to meteorological events (floods, cyclones and droughts), only minor attention is given to biological threats (malaria) by these national stakeholders and the relevant strategies.
- There appears to be a good level of coordination between the national stakeholders and local ones in terms of emergency response and disaster relief, whereas less data is found on how these stakeholders are linked and cooperate regarding long terms risk mitigation measures.
- As only stakeholders recognised and gathered during technical workshops with the local government and in existing documentation were possible to be included in the analysis, there emerged an evident need for further recognition of the significance, perspectives and contributions of private stakeholders, civil society organisations, and most critically, groups in vulnerable situations, that should be also highly connected with the Local Government.



# Annex VII



**Urban Resilience  
Unit Terms of Reference  
Maputo City Council**

# Annex VII

## Urban Resilience Unit Terms of Reference

### Maputo City Council

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#### Context

The United Nations Human Settlements Programme (UN-Habitat) is the agency for human settlements mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities. UN-Habitat helps the urban poor by transforming cities into safer and healthier places with better opportunities. It works with organizations at every level, including all spheres of government, civil society and the private sector.

As the main UN Agency responsible for ensuring the sustainable development of cities, towns, and other human settlements, UN-Habitat is strategically placed to coordinate the humanitarian and development efforts of multiple actors and policy makers at all levels in the common pursuit of urban resilience. UN-Habitat is focused on supporting local capacities in Cities, and humanitarian partners, in measuring their resilience status and have an action plan in order to build resilience. The action builds on the achievements of the Hyogo Framework for Action – Building the Resilience of Nations 2005-2015, and paves the way toward the implementation of the Sendai Framework for DRR (Disaster Risk Reduction) 2015-2030 at the local level and the New Urban Agenda adopted at Habitat III (The United Nations Conference on Housing and Sustainable Urban Development) in Quito, Ecuador October 2016 and the Global Agenda 2030 for Sustainable Development, making cities and communities sustainable, safe and resilient (SDG 11).

Fast growing cities and urban areas of the world are engines of growth and wealth accumulation and Maputo is not an exception. This growth can have positive social, cultural and educational impacts. On the other hand, evidence demonstrates that fast economic growth, combined with rapid sprawling population expansion in urban areas, also increases disaster vulnerability and exposure. Maputo City is highly exposed to natural hazards and Climate Change impacts and is increasingly affected by strong winds, floods, severe erosion, saltwater intrusion, loss of vital infrastructure and the spread of diseases such as malaria, cholera, and influenza, being at the highest exposition and vulnerability risk due to the fact is a coastal city. Furthermore, changing rainfall patterns will lead to a decrease of soil water recharge, impacting ground water resources and the water table in wells, as the reduction of Mozambique's trans-boundary river flows will decrease the availability of surface water. All this climate change related impacts will be worsened by the fast urbanization processes happening in Maputo city (32%), increasing the high vulnerability of people, assets and systems towards natural hazards and socio-economic shocks and stresses. UN-Habitat, through its joint initiative with UNISDR (United Nations International Strategy for Disaster Reduction) and the European Commission the City Resilience Profiling Programme (CRPP), goes beyond conventional approaches to 'risk reduction', delivering a forward-looking, multi-sectoral, multi-hazard, multi-stakeholder model for building resilience that recognizes the complexities and unique value of cities, and the inherent interdependencies of each part of an urban system.

Citizens and local communities must be able to easily respond and quickly react towards climate change impacts, human-made hazards and better understand and plan for resilience building and therefore it is important that the Governance mechanisms in cities are deployed in a manner that resilience is mainstreamed and resources are leveraged to build resilience.

#### Urban Resilience Concept

Urban resilience is the measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability. A resilient city assesses, plans and acts to prepare for and respond to hazards – natural and human-made, sudden and slow-onset, expected and unexpected – in order to protect and enhance people's lives, secure development gains, foster an investible environment, and drive positive change.

To be truly resilient, cities should work towards sustainability to ensure positive long-term impacts, and in the same manner, being truly sustainable entails incorporating resilience to drive and protect development goals. Resilience also lies at the core of the humanitarian-development nexus, bridging together two often disparate agendas. Ingraining resilience can reduce risks by increasing capacities and addressing vulnerabilities can decrease fragility and mitigate impacts, hereby enhancing effective and forward-thinking response. Building urban resilience takes on multiple forms, but in its essence must seek the betterment of people, specifically those in vulnerable situations, who are at the center of our aim and mandate.

By engaging all stakeholders in resilience efforts, cities have the ability to harness transformational change and improve the lives of their inhabitants. This has been acknowledged by the global community through agreements such as the New Urban Agenda, Paris Agreement, Sustainable Development Goals, and Sendai Framework, however in almost all contexts, cities lack the capacity to operationalize these alone and fully harness change. One approach to addressing this is through holistic and multi-stakeholder resilience-building. Resilience offers a crucial meeting point among different yet essentially similar paradigms in urban development.

## Justification for Urban Resilience Unit in Maputo Municipality

People in vulnerable situations and the urban poor are disproportionately affected by shocks and stresses as they often live in precarious locations and situations, do may not have the resources or capacity to recover. To protect inhabitant's lives, and lead them towards sustainability, the best strategy fruitful demonstrated from the municipal governance perspective is to implement resilience strategies. In the pursuit of its actions the municipality of Maputo is guided through the various plans, policies and strategies developed by both the Central Government and the Municipal Council. Some of the key policies include the Maputo City Council Five-Year Program for 2014-2018, the Urban Solid Waste Management Master Plan in Maputo City, the Urban Solid Waste Management Regulation, and the Hazardous Waste Management Regulations. Among several strategies that are most relevant to the Municipality in the context of Urban Resilience is the National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC) for the period 2013-2025. This strategy defines as a national priority the adaptation and reduction of climate risk and groups strategic actions within the two main pillars (i) Adaptation and reduction of climate risk and (ii) Low carbon mitigation and development, in particular the development of resilience mechanisms urban areas and other settlements and promoting low-carbon development and the green economy through their integration into the sectoral and local planning process. For resilience strategies to become integral in the municipal policy a Municipal Resilience Unit is totally needed. This initiative aims at improving capacity of local government (Maputo City Council) and stakeholders in understanding and promoting a resilient development planning. Similar initiatives are being deployed in several cities throughout the world aiming at strengthening their capacities for resilience building; as an example, is the Barcelona Municipality that has a Resilience Department. A successful urban resilience agenda requires partnerships between all key international actors, as well as the engagement with principle national, regional and city players. Besides, inclusive cooperation is needed in order to build upon a shared resilient vision which might be undertaken under the umbrella of the Resilience Unit.

## Main Objective of Establishment of Urban Resilience Unit in Maputo Municipality

The overall objective of this Unit is to build more inclusive, sustainable, and resilient city, by strengthening the capacity of the local government, key public, private and civil society stakeholders to measure, make decisions, plan and develop actions for building resilience to ensure that public and private investments are risk and resilience-informed and that early interventions are linked to longer-term development goals in line with the actions of the New Urban Agenda and the global agendas such as the Sendai Framework for DRR and the Agenda 2030 for Sustainable Development. The Resilience Unit will ensure that the Municipality of Maputo applies a resilience lens so that resilience is mainstreamed in every sector, project and planning cycle, still ensuring that the resources are leveraged holistically and bringing all stakeholders to act at the same board. The Urban Resilience Unit under full support of UN-Habitat in an initial phase, will serve as basis to strengthen the capacity of Maputo Municipality to make decisions and develop plans, policies, practices and actions for building resilience at city level. To do so, UN-Habitat's Urban Resilience Programme will equip the Municipal council and its personnel with tools and information that can support the Unit for more effective and

comprehensive integration of resilience into urban management, empowering the City of Maputo to 'do more with what it has' and catalyze new finance opportunities by promoting resilience as a criterion for investment.

## Urban Resilience Unit Main Responsibilities

- The Resilience Unit will be linked to International Community through International Resilience Campaigns and Action Boards, with the aim of being a reference point not only in Mozambique but in Africa.
- The Resilience Unit will identify and be involved in National and Regional Resilience Strategies working closely with National and Regional Administrative bodies, supporting the mainstreaming of Resilience through the Legal National Framework.
- The Resilience Unit will work under the umbrella of the Governance Architecture of Municipality. It has not a fixed place yet, being something to discuss where it is specifically located within. Our recommendation, due to the fact that the aim of this unit is fundamentally holistic and cross sectorial, ideally, it could be located within the Mayor's Cabinet body.
- The Resilience Unit will have the following tasks:
  - Acting as Cross-sectorial Unit within the municipality and related departments to support resilience's mainstreaming.
  - Rallying the necessary political and technical support from government departments and related stakeholders.
  - Coordinating and leading resilience strategy and urban resilience projects with different kind of partners (institutions, enterprises and academia) from local to national and international. Positioning of Maputo and companies based in the city that collaborate in the development and implementation of resilience projects as referents in this field, as well as international institutions (City Resilience Profilling Programme of UN-Habitat,...)
  - Supporting data collection and data management: Assess the data collection process, prioritize areas that need support, identify gaps, overlapping, risks and challenges.
  - Assisting in the development of Actions for Resilience, incorporating assessments, reflections and findings from the data collection and diagnosis process.
  - Ensuring the mainstreaming and integration of resilience into planning and governance cycle of the Municipality.
  - Bring together a wide array of stakeholders to learn about the city's challenges and help build support for individual initiatives, and for resilience building in general. These stakeholders include government officials, and it is critical that representatives from the private sector, non-profits, and civil society are also included.
  - Development, monitoring of studies and projects of urban resilience.
  - Creation and leadership of urban resilience broads (URB).
  - Link of communication and coordination with the programs of United Nations and other international institutions oriented to the creation of urban resilience.
  - Dissemination of the urban resilience strategy and projects developed in Maputo nationally and internationally.
  - Representation of the city as a reference in this field in Africa.



Appendices



# Appendices

# Appendix 1



**Current Scenario:  
stresses and stressors  
identification in Maputo**

Key related SDG	Stress	Stressor (stress' factor)	Interrelated stresses
<b>SDG 10</b>	Socio-economic inequity	Spatial segregation/ Zoning impacts	Illiteracy; Gender inequity; Unhealthy economic growth and unemployment; Rapid and unregulated urbanization; Justice and security deficit.
		Insecurity of tenure	
		Informal economy	Concentrated poverty; Hunger and malnutrition; Illiteracy; Gender inequity; High dependency on non-clean energy; Unhealthy economic growth and unemployment; Rapid and unregulated urbanization; Ecosystem degradation; Lack of policies and institutional cohesion.
		Social exclusion (i.e. Lack of social inclusion)	
<b>SDG 11</b>	Rapid and Unregulated urbanization	Informal settlements	Concentrated poverty; Hunger and malnutrition; Gender inequity; Miss-management of urban metabolism; High dependency on non-clean energy; Unhealthy economic growth and unemployment; Fragile infrastructures; Unsustainable industrial development; Socio-economic inequality; Inefficiency in the use of resources; Ecosystem degradation; Lack of policies and institutional cohesion.
		Inadequate structures - inadequate enforcement of rules and regulations	
		Inadequate coverage of basic infrastructure	
		Inefficient mobility	
<b>SDG 6</b>	Miss-management of urban metabolism	Mismanagement of water cycle	Hunger and malnutrition; High dependency on non-clean energy; Unhealthy economic growth and unemployment; Inefficiency in the use of resources; Ecosystem degradation; Lack of policies and institutional cohesion.
		Mismanagement of solid waste	
		Mismanagement of ecosystem services and related infrastructures	

**Table 1:** Stresses and stressors identification in Maputo in relationship with SDGs.. Source: CRPT (2019).

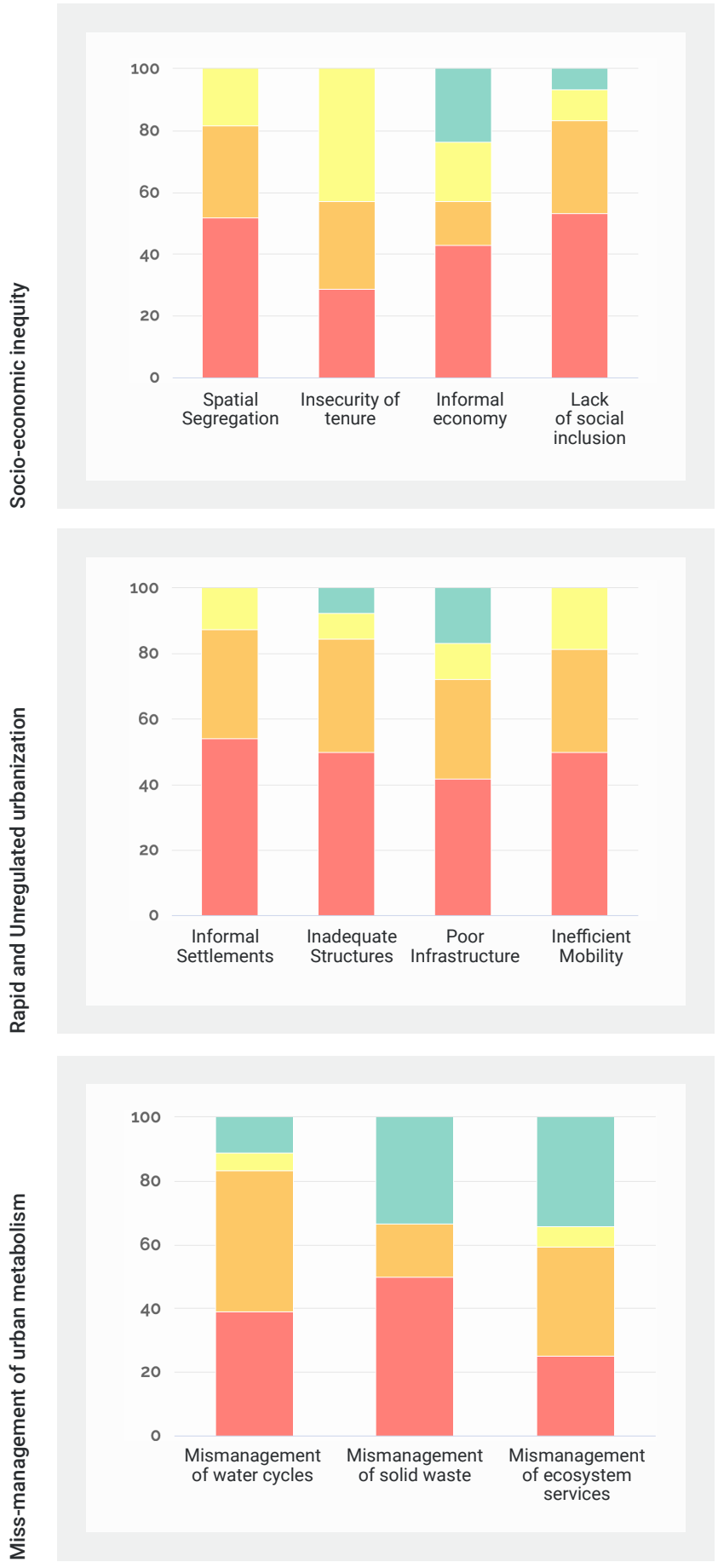


Figure 1: Stressors / Indicators benchmarking exercise in Maputo. Source: CRPT (2019).

This graphic is presenting the indicators of each element that are related with any of the stresses considered in the analysis: socio-economic inequity, unregulated urbanization and miss-management of urban metabolism. Indicators not directly related with the stresses considered are excluded from this representation.



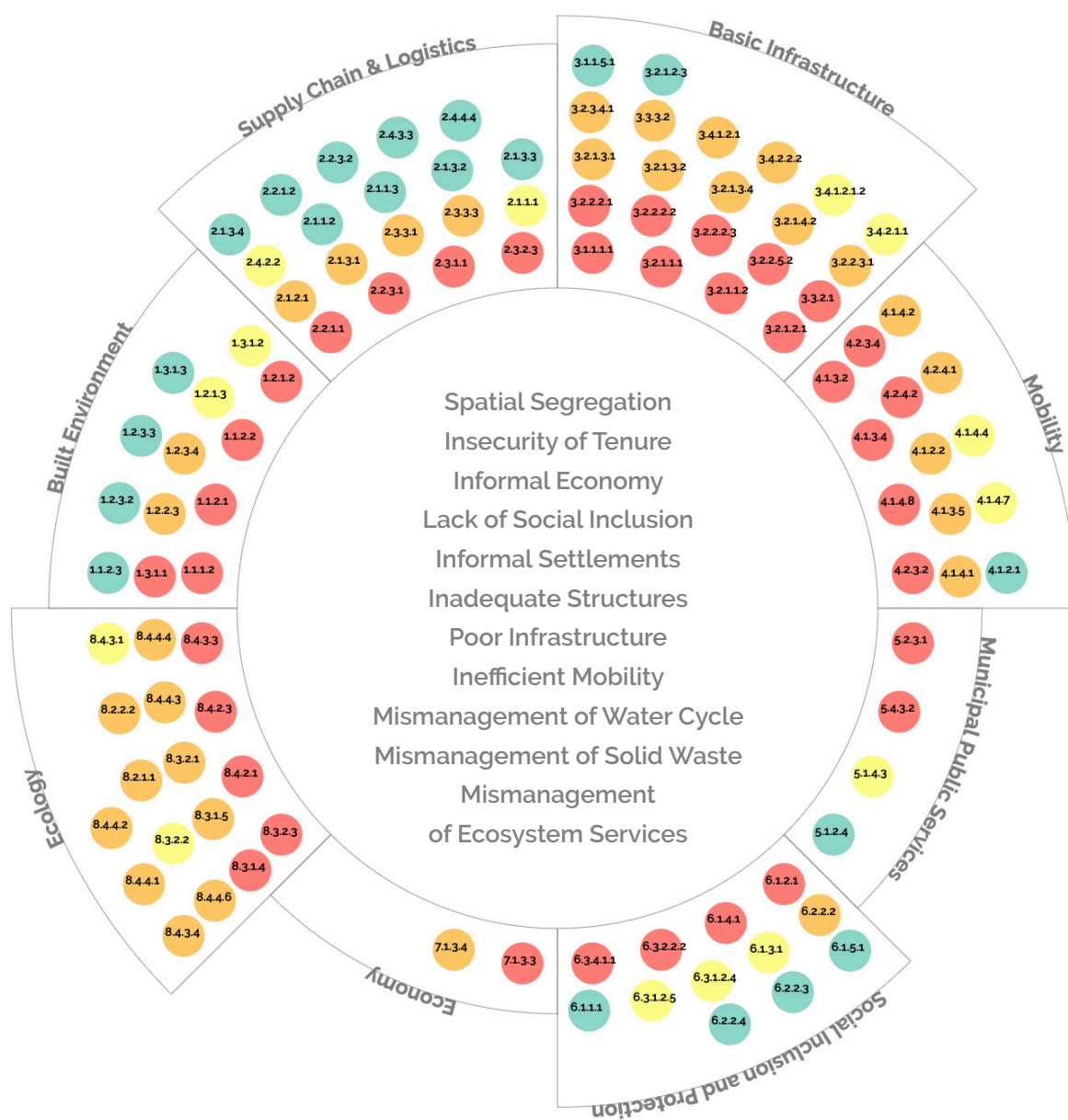


Figure 2: Current scenario. Stresses filter. Source: CRPT (2019).









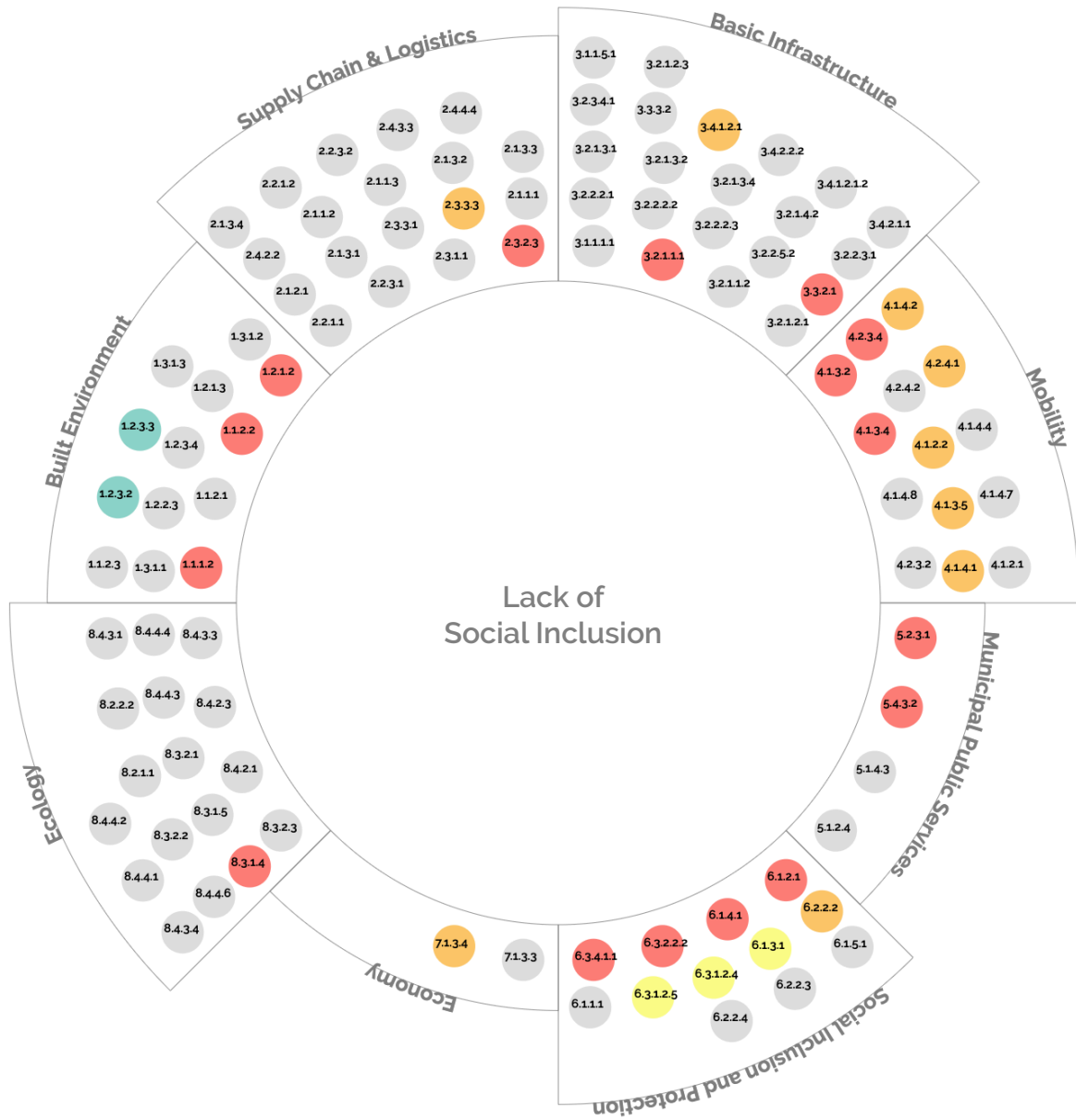


Figure 6: Stresses filter: Lack of Social Inclusion. Source: CRPT (2019).

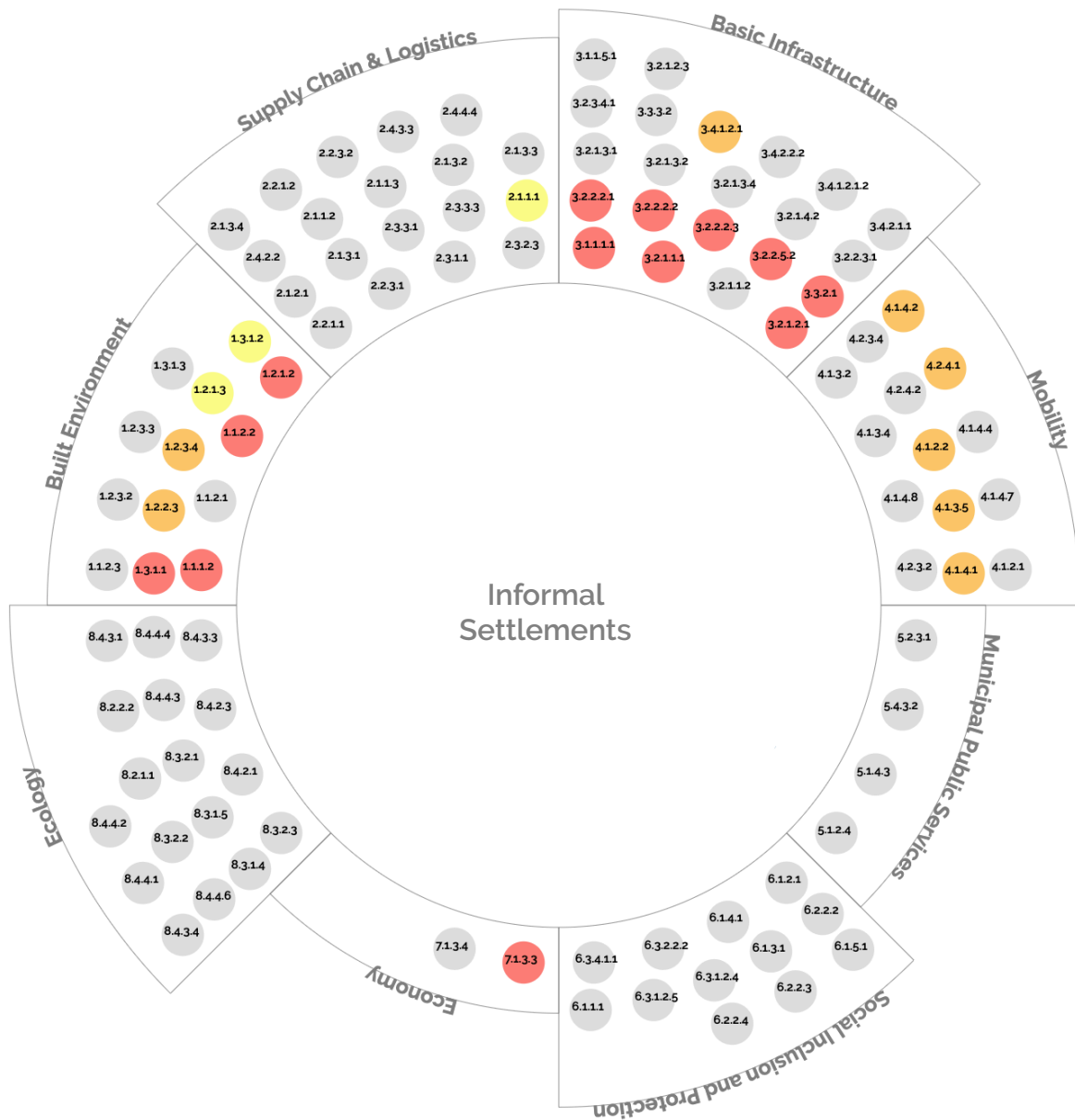


Figure 7: Stresses filter: Informal settlements. Source: CRPT (2019).

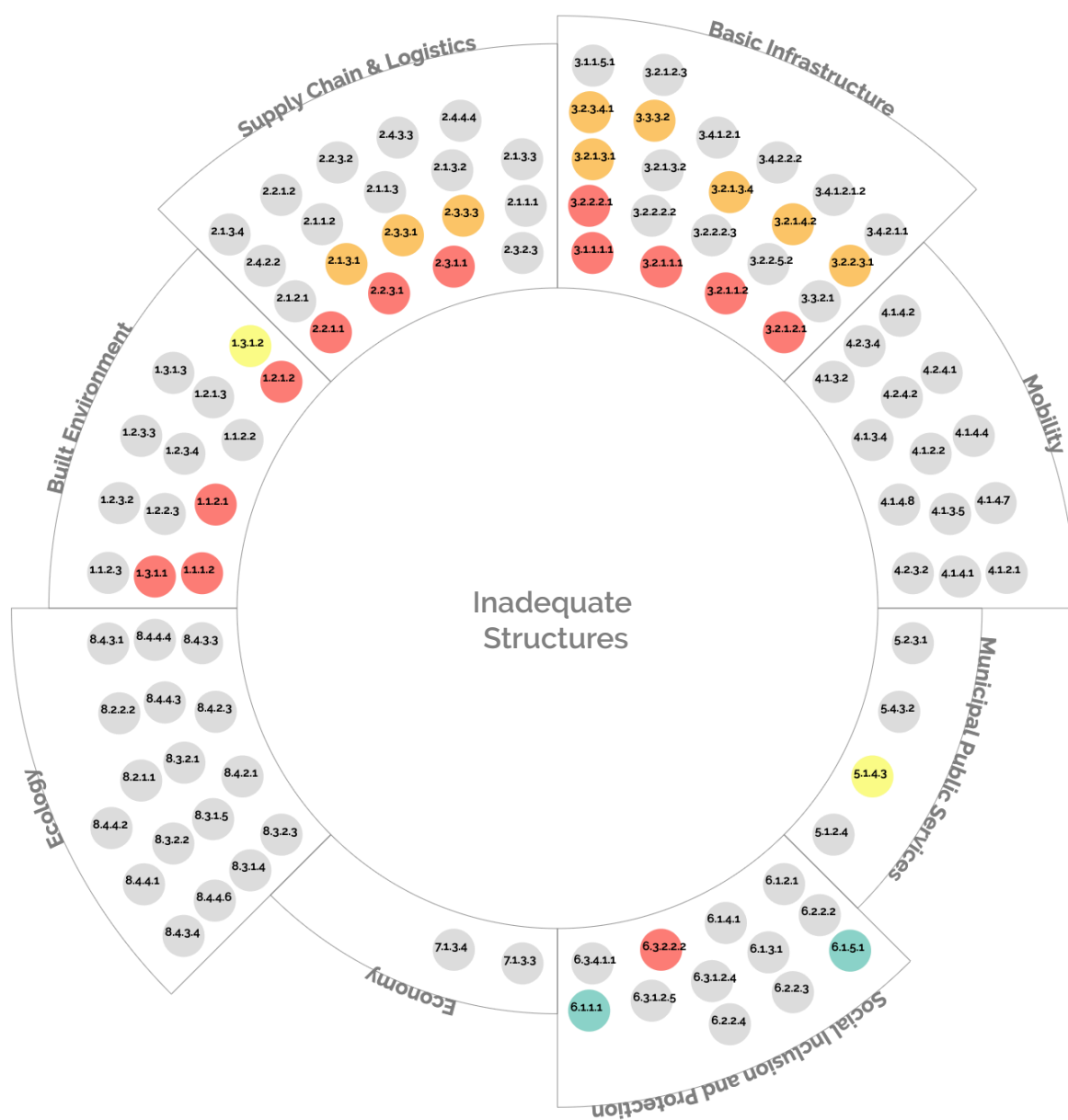


Figure 8: Stresses filter: Inadequate Structures. Source: CRPT (2019).

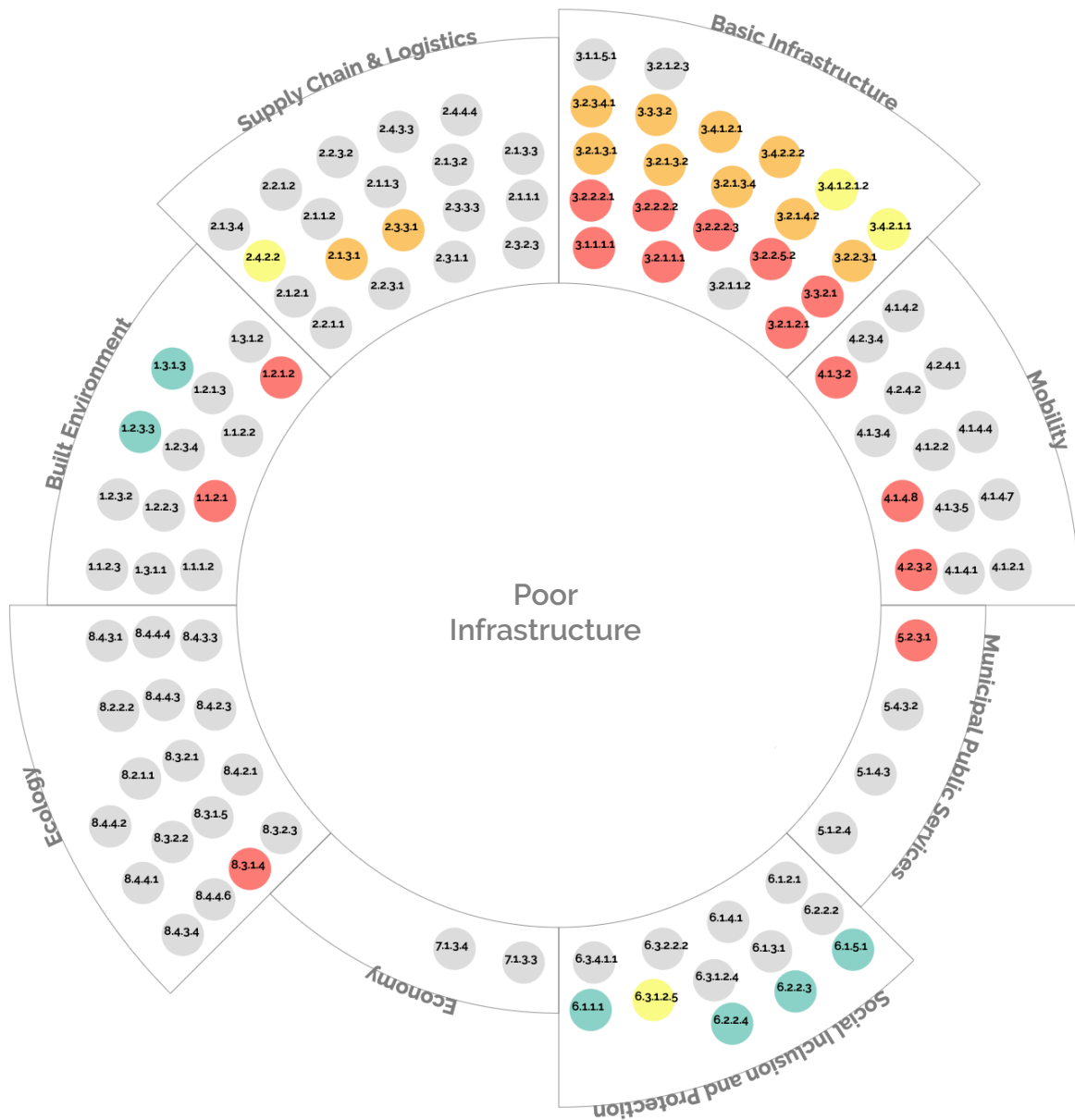


Figure 9: Stresses filter: Poor Infrastructure. Source: CRPT (2019).

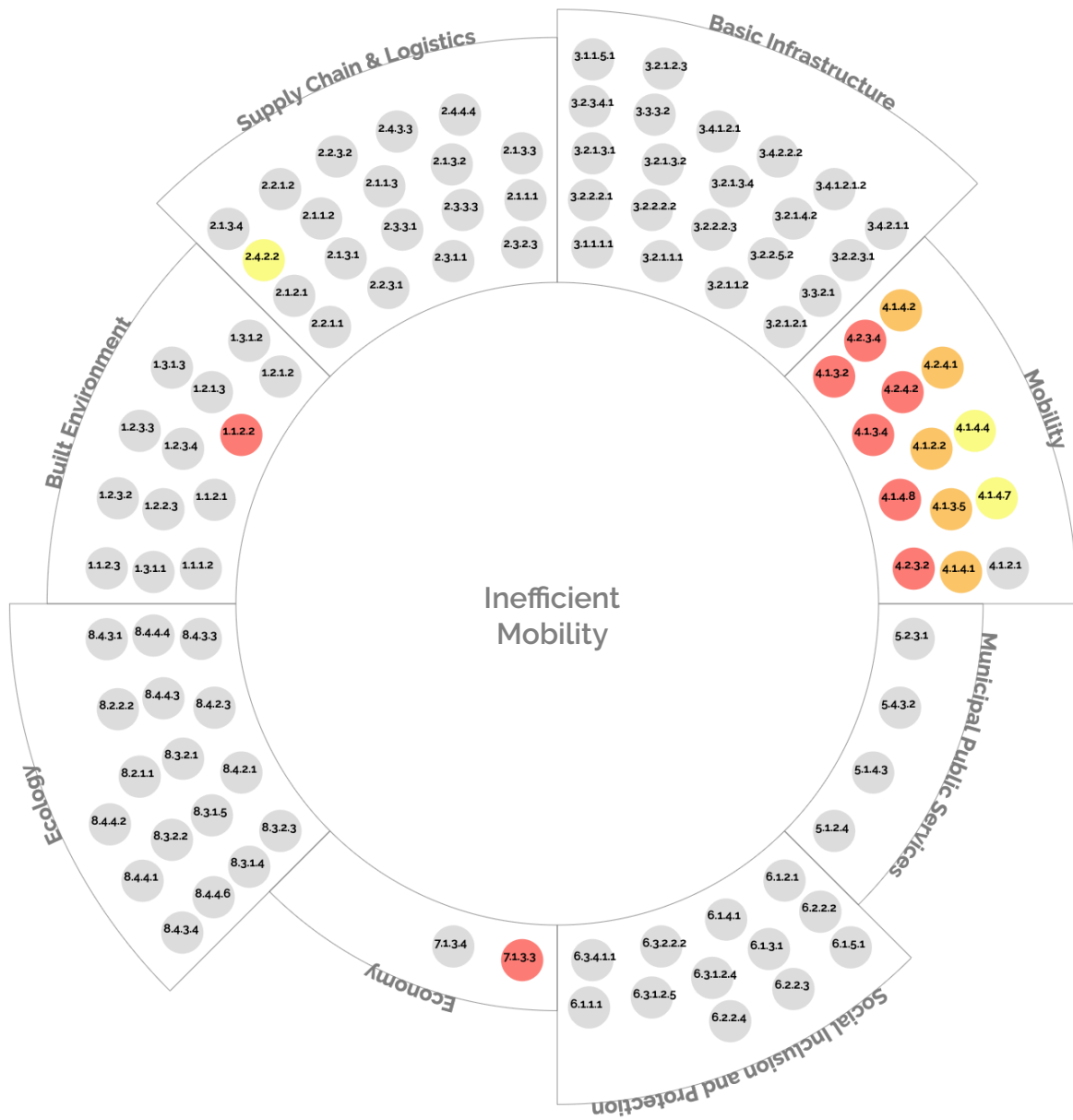


Figure 10: Stresses filter: Inefficient Mobility. Source: CRPT (2019).

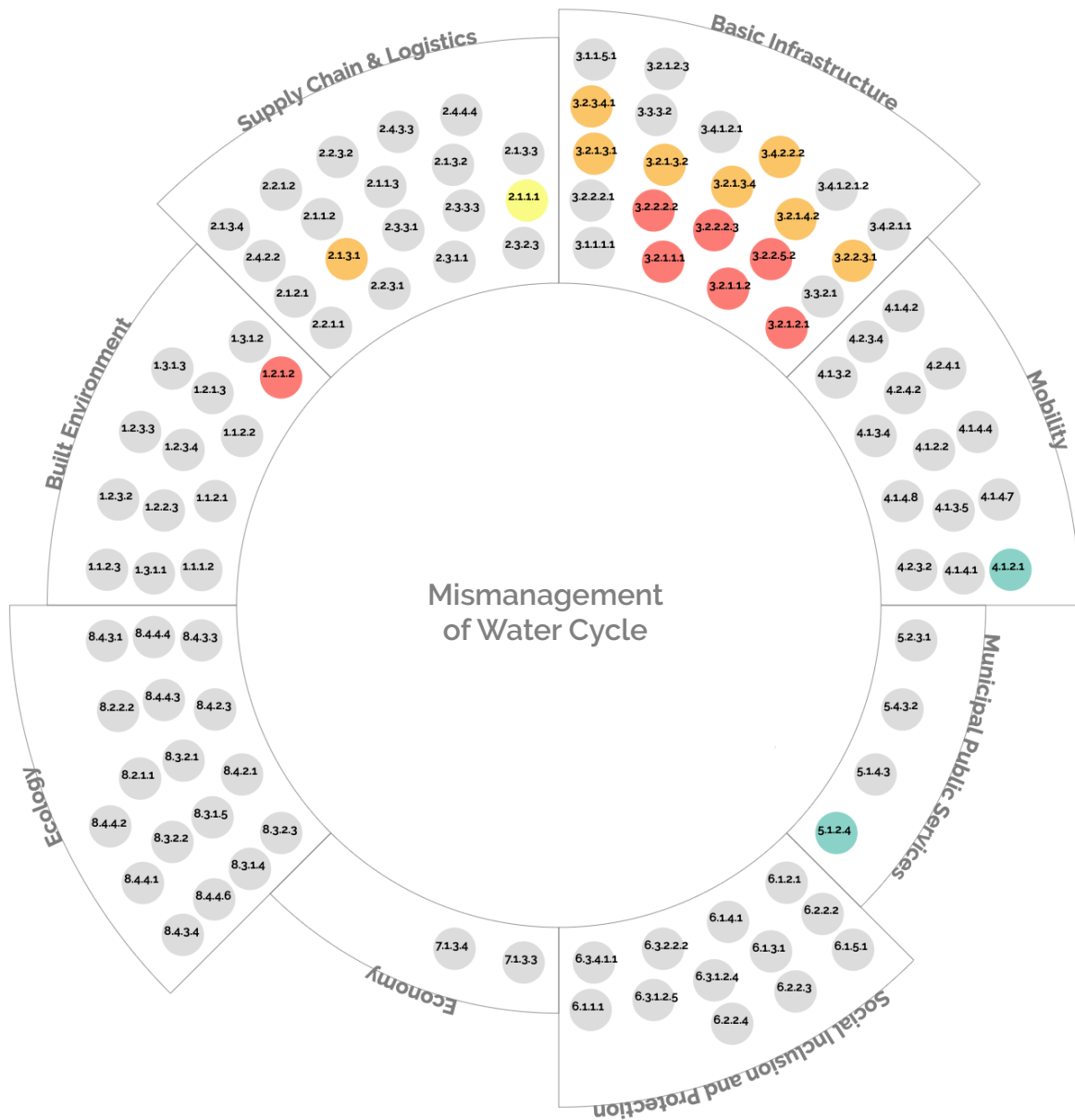


Figure 11: Stresses filter: Mismanagement of Water Cycle. Source: CRPT (2019).



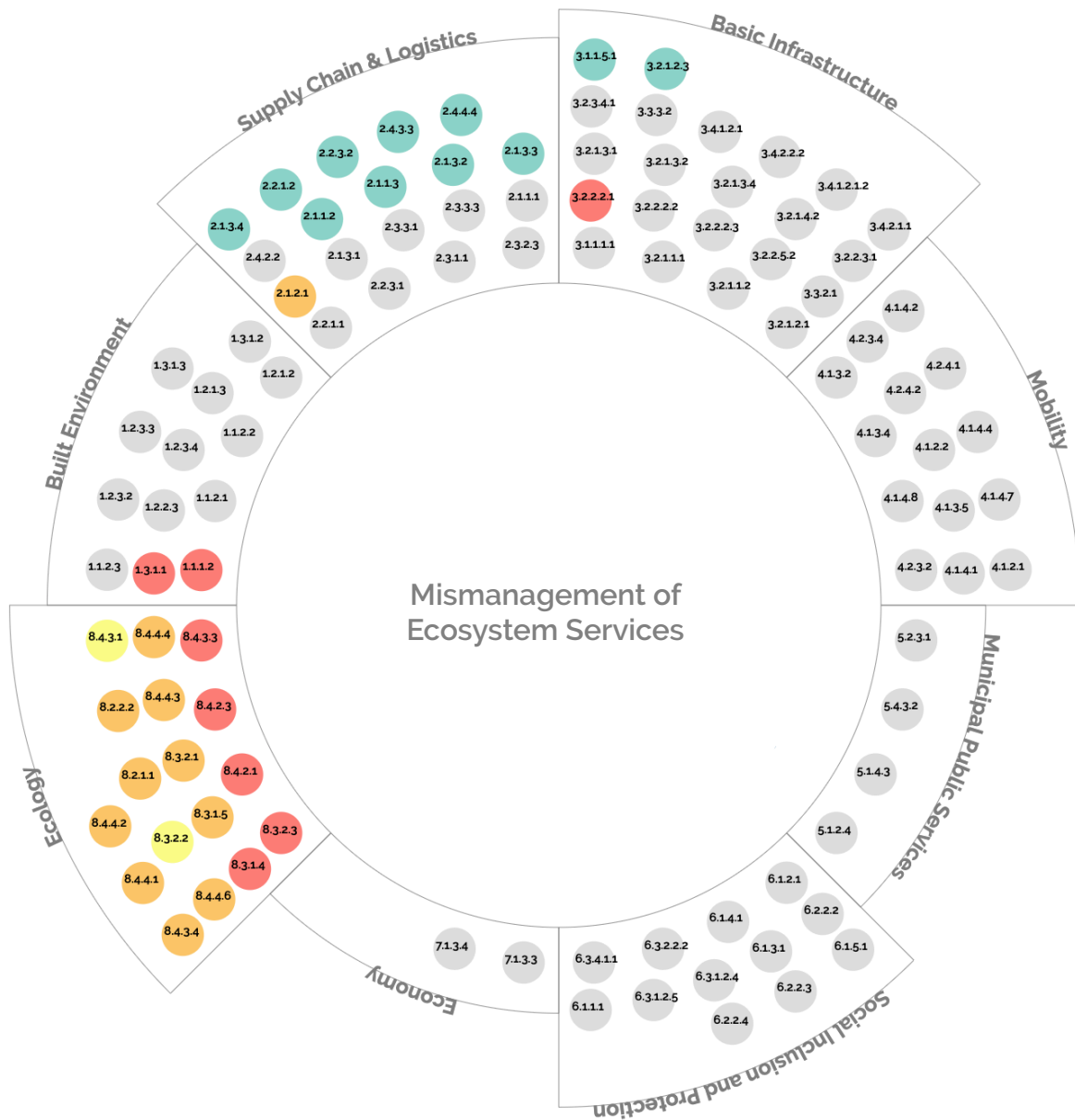


Figure 13: Stresses filter: Mismanagement of Ecosystem Services. Source: CRPT (2019).





# Appendix 2

**Current Scenario:  
selection of indicators and  
their relationships with shocks  
and stresses in Maputo**



Legend				
Stressors	Relationship between Indicators / Stressors / shocks from 1 to 3	1	2	3
1. Spatial segregation / zoning				
2. Insecurity of tenure				
3. Informal economy				
4. Lack of social inclusion				
5. Informal settlements				
6. Inadequate structures - caused by inadequate enforcement of rules and regulations –				
7. Inadequate coverage of basic infrastructure - Poor infrastructure –				
8. Inefficient mobility				
9. Mismanagement of water cycles				
10. Mismanagement of solid waste				
11. Mismanagement of ecosystem services and related infrastructures				

Element	Component	Question	Color
01 BEN	1.1 Urban form	1.1.1.2 Percentage of urban footprint located in hazardous areas.	
		1.1.2.1 Percentage of open areas within the urban footprint.	
		1.1.2.2 Percentage of streets within the urban footprint.	
	1.2 Land tenure	1.2.1.2 Percentage of city area considered informal.	
	1.3 Housing	1.3.1.1 Percentage of homes in hazardous location.	
02 SCL	2.2 Energy resources	2.2.1.1 Proportion of energy consumed from each source, based on shares in total final consumption.	
		2.2.3.1 Existence of energy efficiency regulations in place.	
	2.3 Food supply	2.3.1.1 Average dietary energy supply adequacy (disaggregated by basic food commodity groups, if possible).	
		2.3.2.3 Proportion of households obtaining food through different avenues. <b>-98%</b>	
<b>INFORMAL MARKETS -</b>			
03 BIN	3.1.1 Energy supply building	3.1.1.1.1 Proportion of population with access to any means of electricity supply	
		3.2.1 Water supply	3.2.1.1.1 Percentage of population with access to water services
		3.2.1.1.2 Are there obligations/incentives in the building codes for secondary source/reusing of water?	
		3.2.1.2.1 Percentage of households covered by piped water supply network.	
	3.2.2 Wastewater and sanitation	3.2.2.2.1 Percentage of households connected to a wastewater network.	
		3.2.2.2.2 Is the network able to cope with seasonal increase in wastewater?	
		3.2.2.2.3 Is the network able to cope with seasonal increase in rain/stormwater (if combined sewer system)?	
		3.2.2.5.2 Is the city conducting regular sampling of wastewater discharge for compliance with water quality standards?	
	3.3 Solid waste	3.3.2.1 Percentage of population with regular municipal solid waste collection service (at least once a week)	
	3.4.1 Phone and internet	3.4.1.1.2 Access Opportunities - Number of subscriptions per 100 inhabitants ( <b>Fixed telephone network</b> )	
		3.4.1.2.1 Percentage of households covered by communication network, per network type [+] <b>(Fixed telephone network)</b>	
04 MOB	4.1 Urban mobility	4.1.1.4 Percentage of passengers that transfer between modes more than once per journey	
		4.1.3.2 Is public transport affordable?	
		4.1.3.4 Is public transport accessible to people with reduced-mobility?	
		4.1.4.2 Does the service have adequate redundant capacity?	
		4.1.4.8 Does the city have an integrated central control of all transport modes?	
	4.2 Inter-regional mobility	4.2.3.2 Availability of adequate car parking? ( <b>Coach, Train and Port stations</b> )	
		4.2.3.4 Is it accessible for people with reduced-mobility? ( <b>Airport</b> )	
		4.2.4.2 Does these services have adequate redundant capacity?	
05 MPS	5.2 Civil registration services	5.2.3.1 Proportion of children under 5 years of age whose births have been registered with a civil authority.	
	5.4 Cultural heritage and cultural activities	5.4.3.2 Do all ethnic minorities in the city have the right to enjoy their culture, practice their religion, and use their own language in private and in public?	

	Stresses											Shocks			
	Socio-Economic Inequity				Rapid and Unregulated Urbanization				Mismanagement of Urban Metabolism			Floods	Droughts	Tropical Cyclones	Malaria
	1	2	3	4	5	6	7	8	9	10	11				
	3			1	1	2				2		2		2	2
	3					2	1								
	1			2	2			2							
	3	3	3	3	3	2	2		2	2		2			2
	3	3	2		1	2				2		2		2	
						2								2	
						2									
			1			2							2		
	2		3	2									2		
	1				1	2	2							1	
	1			1	1	2	2		3			2	2		
						2			3						
	2		1		1	3	3		3						
	2		1		1	3	3			2	1	1			1
					1		1		2			1			1
					1		2		2						
	1				3		3		2						
	1			1	1		2			3					2
	1			1	1		3								
	1			1	1		3								
	2				1			3							
			3	2			1	3							
				2				3							
								3							
								1	3						
								1	2						
				2				2							
								2							
				2					1						
				2											

Element	Component	Question	Color
<b>06 SiP</b>	6.1 Social accountability	6.1.2.1 Are there currently any citizens' initiatives under way?	
		6.1.4.1 Does the local government collect citizens' feedback?	
	* BSC: Basic Social Services	6.3.2 Access to bsc* - health	
	6.3.4 Access to bsc* - food	6.3.4.1.1 Existence of malnutrition in the city?	
<b>07 ECN</b>	7.1 Local ecn structure	7.1.3.3 Informal employment rate	
<b>08 ECL</b>	8.3 Biodiversity and green infrastructure	8.3.1.4 Specify the urban green space per capita	
		8.3.2.3 Please specify the total size of the number of areas (in ha) that connect protected natural areas and urban green spaces in the city, using the Green Infrastructure Index as measure.	
	8.4 Environmental quality	8.4.2.1 Particulate matter (PM10) concentration (24-hour average)	
		8.4.2.3 Nitrogen dioxide (NO2) concentration (1-hour average)	
		8.4.3.3 Select the pollutants present in Marine Class I water that have transgressed the established limit	
<b>01 BIN</b>	1.2 Land tenure	1.2.2.3 Percentage of households experiencing land conflict	
		1.2.3.4 Is the city conducting awareness-raising campaigns and projects regarding the use and ownership of land?	
<b>02 SCL</b>	2.1 Water resources	2.1.2.1.b Total domestic water consumption per capita	
		2.1.3.1 Existence of (IWRM) toolbox components in place.	
	2.3 Food supply chain	2.3.1.3 Percentage of functional area with arable land (disaggregated by tenure type, if possible)	
		2.3.3.1 What level of disruptions does the food supply chain face? (per food supply chain stage, if possible) [+]	
		2.3.3.3 Does the city have access to food reserves and/or other strategies for food emergencies?	



	Stresses											Shocks			
	Socio-Economic Inequity				Rapid and Unregulated Urbanization				Mismanagement of Urban Metabolism			Floods	Droughts	Tropical Cyclones	Malaria
	1	2	3	4	5	6	7	8	9	10	11				
	1		1	2											
	1			2											
				2		2									
				2											
			2		2			2							
				1				1				2			
												2			
												2			
												2			
		2	1		1										
		2			1										
	1		1	1			2		2						
						1	1		2						
												1	1		
			1			2	1					1	1		
				1		2						1	1		

Element	Component	Question	Color
03 BIN	3.2.1 Water supply	3.2.1.3.1 Percentage of unaccounted for water (water loss).	Orange
		3.2.1.3.2 Annual daily average of hours of continuous water supply service	
		3.2.1.3.4 What level of unplanned disruptions does the service face?	
		3.2.1.4.2 What maintenance and monitoring measures are applied?	
	3.2.2 Wastewater & sanitation	3.2.2.3.1 Proportion of wastewater that is safely treated.	
	3.2.3 Stormwater	3.2.3.4.1 What monitoring and maintenance measures are applied?	
	3.3 Solid waste	3.3.3.2 Legal obligation of pre-treatment for non-municipal solid waste generators?	
	3.4.1 Telecoms - phone and internet	3.4.1.2.1 Percentage of households covered by communication network, per network type [+]	
	3.4.2 Telecoms - tv and radio	3.4.2.2.2 Is the city covered by any local, regional or national public broadcasting?	
	04 MOB	4.1 Urban mobility	
4.1.3.5 Average commuting travel time using various modes of transport			
4.1.4.1 What level of disruptions does the service face? <b>(Public Mode)</b>			
4.1.4.1 What level of disruptions does the service face? <b>(Private Mode)</b>			
4.1.4.2 Does the service have adequate redundant capacity? <b>(Private Mode)</b>			
4.2 Inter-regional mob			4.2.4.1 What level of disruptions does the service face? (Bus - Coach Station)
06 SIP		6.2 Access to social protection floor for all	6.2.2.2 Access to family planning and reproductive healthcare services.
07 ECN	7.1 Local economic structure	7.1.3.4 Youth unemployment rate (Please disaggregate by sex and groups in vulnerable situations, if possible)	

	Stresses											Shocks				
	Socio-Economic Inequity				Rapid and Unregulated Urbanization				Mismanagement of Urban Metabolism			Floods	Droughts	Tropical Cyclones	Malaria	
	1	2	3	4	5	6	7	8	9	10	11					
						1	1			2						
	1									2						
						1	1			2						
						1	1			2						
						1	1			2						
						1	1					2				
	1							2								
								2								
	1			1	1			2				1				
	1			1	1			2				1				
	1			1	1			2				1				
	1			1	1			2				1				
				2												
	1		1	1												

Element	Component	Question	Color
08 ECL	8.2 Ecological footprint	8.2.1.1 What is the biocapacity of the region over the last 10 years? Please specify the area size (in hectares) of each land use type present in the region, in order to calculate the area's biocapacity (in global hectares) for 2008 and 2017.	
		8.2.2.2 Ecological Footprint of Consumption (10 year trend)	
	8.3 Biodiversity and green infrastructure	8.3.1.5 Proportion of urban green space cover (including vegetation canopy cover and blue areas), as percentage of the size of the functional area.	
		8.3.2.1 Please, specify the proportion of natural areas in the region that is protected	
	8.4 Environmental quality	8.4.3.4 Select the pollutants present in Marine Class II water that have transgressed the established limit	
		8.4.4.1 Are there areas in the city with significant land pollution (e.g. brownfield sites, riverbeds, agricultural sites etc.)?	
		8.4.4.2 Are there currently areas in the city with significant thermal pollution (e.g. heat island effect)?	
		8.4.4.3 Are there currently areas in the city with significant radioactive pollution (e.g. nuclear power plants, industrial sites, hospitals etc.)?	
		8.4.4.4 Are there currently areas in the city with significant noise pollution?	
		8.4.4.6 Other types of pollution not included in this report [+]	
01 BEN	1.2 Land tenure	1.2.1.3 Percentage of informal land under tenure formalisation.	
	1.3 Housing	1.3.1.2 Percentage of homes with inadequate structure.	
02 SCL	2.1 Water resources	2.1.1.1 Proportion of water supplied from each source.	
	2.4 Urban logistics	2.4.2.2 Logistics facility capacity and complexity, per key logistics facility.	
03 BIN	3.4.2 Telecoms – tv and radio	3.4.2.1.1 Diversity of Access Mode, by mode and device options (Please disaggregate by sex and groups in vulnerable situation, if possible)	
04MOB	4.1 Urban mobility	4.1.4.4 What is the average travel speed on major thoroughfares during peak hours? <b>(Public Mode and Private Mode)</b>	
		4.1.4.7 Transportation fatalities per 1000 population (Please disaggregate by sex and groups in vulnerable situations, if possible)	
05 MPS	5.1 Cemeteries crematoriums	5.1.4.3 Is compliance with the existing regulations or protocols monitored and enforced?	



Element	Component	Question	Color
<b>06 SIP</b>	6.1 Social accountability	6.1.3.1 Does the local government include CSOs in decision making processes?	Orange
	6.3.1 Access to bsc* - education	6.3.1.2.4 Do students have access to public transportation to get to schools not within walking distance?	
		6.3.1.2.5 Do disabled students have access to schools?	
<b>08 ECL</b>	8.3 Biodiversity and green infrastructure	8.3.2.2 Please specify whether expenditure (public and private) per capita spent on the preservation, protection and conservation of natural heritage is increasing, stable, or decreasing.	Orange
	8.4 Environmental quality	8.4.3.1 Select the pollutants present in ground water that have transgressed the established limit	
<b>01 BEN</b>	1.1 Urban form	1.1.2.3 Street intersection density.	Teal
	1.2 Land tenure	1.2.3.2 Does the city authority in charge of land recognise and practice continuum of land rights?	
		1.2.3.3 Is the city practicing pro-poor land administration?	
1.3 Housing	1.3.1.3 Quantitative housing shortage.		
<b>02 SCL</b>	2.1 Water resources	2.1.1.2 Does the city have an operational prioritisation of water sources based on water level data?	Teal
		2.1.1.3 Does the city have strategies in place for alternative resources in times of unavailability of primary water sources?	
		2.1.2.1 Water consumption per capita (liters/day).	
		2.1.3.2 If the city belongs to a transboundary basin area, is there an operational arrangement for water cooperation among relevant authorities?	
		2.1.3.3 Does the city have established and operational policies and procedures for participation of local communities in water management?	
		2.1.3.4 Is the city implementing water demand management strategies?	
	2.2 Energy resources	2.2.1.2 Number of supply routes and suppliers for each energy source	Teal
		2.2.3.2 Does the local government finance clean/renewable energy transition and energy efficiency initiatives?	
	2.4 Urban logistics	2.4.3.3 Existence of public policies at the local level aimed at encouraging more sustainable practices in urban logistics systems?	Teal
		2.4.4.4 Existence of integrated coordination body/ system for managing urban logistics operation?	

	Stresses											Shocks				
	Socio-Economic Inequity				Rapid and Unregulated Urbanization				Mismanagement of Urban Metabolism			Floods	Droughts	Tropical Cyclones	Malaria	
	1	2	3	4	5	6	7	8	9	10	11					
				2												
	1		1	2												
	1			2			1									
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									3							
									1							
									3							

Element	Component	Question	Color
03 BEN	3.1.1 Energy supply building	3.1.1.5.1 What maintenance and monitoring measures are applied in the public network, per energy supply type? [+]	
	3.2.2 Wastewater and sanitation	3.2.1.2.3 Is the capacity of the network able to cope with seasonal increases in water demand?	
		3.2.2.1.1 Percentage of population with access to sanitation facilities (Please disaggregate by sex and groups in vulnerable situation, if possible)	
		3.3 Solid waste	
	3.4.1 Telecommunications - phone and internet	3.3.4.2 Characterise the recovery trend of solid waste in the last 10 years.	
		3.3.5.2 Are controlled disposal sites accessible to businesses, private individuals or informal collectors for the delivery of wastes normally accepted at the site? (If yes, please select site(s) and specify who has access)	
		3.3.5.3 Characterise the trend of solid waste that has been landfilled in the last 10 years.	
		3.4.1.1.1 Percentage of population with access to at least one telecommunication network (Please disaggregate by sex and groups in vulnerable situation, if possible)	
		3.4.1.1.2 Access Opportunities - Number of subscriptions per 100 inhabitants <b>(Mobile Phone Network)</b>	
	3.4.2 Telecoms – tv& radio	3.4.1.2.1.2 If applicable, does the city offer a public network service? <b>(Fixed Broadband Internet)</b>	
3.4.2.2.2 Is the city covered by any local, regional or national public broadcasting? <b>(Radio)</b>			
04MOB	4.1 Urban mob	4.1.2.1 Road network density (km / 100 000 population)	
05MPS	5.1 Cemeteries and crematoriums	5.1.2.4 Does the municipality have plans for further development of the burial and crematory infrastructure?	
	5.3.4 Criminal justice&law enforcement - justice institutions	5.3.4.2.1 Free of charge legal aid availability in the city, including types of legal aid.	
06SIP	6.1 Social accountability	6.1.1.1 Does the local government consult citizens regarding its development interventions?	
		6.1.5.1 Does the local government use grievance redress mechanisms (GRM) in its operations?	
	6.2 Access to social protection floor for all	6.2.2.3 Access to vaccination and immunisation programmes.	
		6.2.2.4 Access to antiretroviral treatments and hepatitis C treatments.	



	Stresses											Shocks				
	Socio-Economic Inequity				Rapid and Unregulated Urbanization				Mismanagement of Urban Metabolism			Floods	Droughts	Tropical Cyclones	Malaria	
	1	2	3	4	5	6	7	8	9	10	11					
									3							
									3							
					1			2								
										1						
										3						
										3						
										3						
					1			2								
					1			2								
					1											
								1								
								2	2							
								1								
					1											
	1				2	2										
	1				2	2										
					1											
					1											

Element	Component	Question	Color
<b>08 ECL</b>	8.1 Ecosystem services	8.1.2.1 Please select the services the local government obtains from the surrounding ecosystems	
		8.1.2.2 Please identify the policies or plans that the local government developed to preserve the selected ecosystem services	
		8.1.2.3 Does the local government take the ecosystem services approach or a different environmental approach into consideration in local policy and planning?	
		8.1.2.4 Is the local government involved in transboundary agreements or collaborations to enable policy and planning for the implementation of ecosystem services approaches?	
	8.3 Biodiversity and green infrastructure	8.3.1.3 Proportion of natural areas and urban green spaces in the city as a % of the urban area	
		8.3.2.4 Does the city take the biodiversity in these corridors, and in their green spaces and blue areas in general, into consideration?	
	8.4 Environmental quality	8.4.2.2 Fine particulate matter (PM2.5) concentration (1-year average)	
		8.4.4.5 Are there currently areas in the city with significant light pollution?	
		8.4.5.1 Existence and monitoring of greenhouse gas inventory	
		8.4.5.2 Existence, monitoring and enforcement of air quality regulations	
		8.4.5.3 Existence, monitoring and enforcement of water quality regulations	

	Stresses											Shocks			
	Socio-Economic Inequity				Rapid and Unregulated Urbanization				Mismanagement of Urban Metabolism			Floods	Droughts	Tropical Cyclones	Malaria
	1	2	3	4	5	6	7	8	9	10	11				
											3				
											3				
											3				
											1				
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# Appendix 3

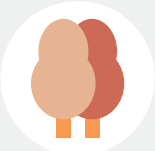
## List of Shocks, Stresses and Stressors

# Selected List: Shocks

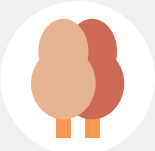
CRPT considers six main groups of shocks, of which four (Natural, Biological, Environmental and Technological / Man-made) are consistent with UNISDR's 2017 terminology and taxonomy on hazards.

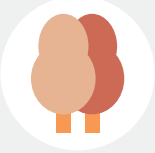
In addition to these four groups, CRPT's list includes Complex shocks as well as Societal shocks that seek to capture a range of potential socio-economic, socio-spatial, or socio-cultural, to name a few, shocks to which a city may be prone.


Group	Type	Sub-type	Description
 <p><b>Biological</b></p>	<b>Infectious diseases</b>	Viral Epidemic & Pandemic Disease	E.g., Rubella/Measles, Small Pox/Variola, Hands, Foot and Mouth Disease (HFMD), Chikungunya, Rift Valley fever, Zica Virus, Influenza, Hepatitis, HIV AIDs and other sexually transmitted diseases.
		Bacterial Epidemic & Pandemic Disease	E.g., Salmonella, Cholera and Tuberculosis
		Parasitic Epidemic & Pandemic Disease.	E.g., Malaria, Chagas Disease, Giardiasis and Trichinellosis
		Fungal Epidemic & Pandemic Disease	E.g., Pneumonia and Fungal Meningitis
		Prion Epidemic & Pandemic Disease	E.g., Bovine Spongiform Encephalopathy (BSE), Creutzfeldt- Jakob-Disease (CJD) and Kuru
	<b>Infestation</b>	Insect Infestation	E.g., Grasshoppers, Locus, African Bees, Coleoptera (beetles).
		Animal, Plant, Fungal & Pest Infestation	E.g., Worms, Rats, Grain-Eating Birds and Rabbit Infestation, Fungal Contamination, noxious or injurious invasive plants (e.g., Kudzu vine).


Group	Type	Sub-type	Description
 <b>Natural</b>	<b>Drought</b>	Drought	An extended period of unusually low precipitation that produces shortage of water for people, animals and plants. The degree of precipitation reduction that constitutes a drought varies by locality, climate and environmental sector.
	<b>Extreme Meteorological Conditions</b>	Heat Wave	Periods of abnormally hot and/or unusually humid weather.
		Cold Wave	Periods of abnormally cold weather that may be aggravated by high winds.
		Extreme Winter Conditions	Extreme winter meteorological conditions such as frost, freeze, snow, and ice.
		Fog	Severe fog events.
	<b>Wildfire</b>	Land Fire	Wildfires are unplanned vegetation fires than may happen in land (bush, brush, grassland, scrub and pasture) and forest areas.
		Forest Fire	
	<b>Earthquake</b>	Ground Shaking	Ground shaking are the result of sudden movements of blocks of the Earth's crust along geological faults.
	<b>Mass Movement</b>	Rockfall	Falling of newly detached mass of rock of any dimension from a cliff or down a very steep slope, caused by factors such as ice wedging, root growth, ground shaking or erosion.
		Landslide	Moderate to rapid soil or debris movement, that includes phenomena such as mudflows, mudslides and debris flows.
		Avalanche	Mass of snow, ice, debris and/or rocks, flowing and sliding rapidly down a steep slope.
		Soil Liquefaction	The transformation of water-saturated soil from a solid state to a liquid state caused by an earthquake. Liquefaction reduces the strength and stiness of soil causing heavy structures (e.g., buildings) to sink and light structures (e.g., underground pipes and tanks), to rise up to the ground surface.





Group	Type	Sub-type	Description
 <b>Natural</b>	<b>Mass Movement</b>	Subsidence	Sinking of the ground due to groundwater removal, mining, dissolution of limestone (e.g., karst, sinkholes), earthquakes, among others
		<b>Volcanic Activity</b>	Volcanic Activity
	Volcanic Eruption		
	<b>Flood</b>	Flash Flood	Heavy or excessive rainfall in a short period of time that produce immediate runoff, creating flooding conditions within minutes or a few hours during or after the rainfall.
		Fluvial Flood	Type of flood resulting from the overflow of water from a stream or river channel onto normally dry land in the floodplain adjacent to the channel.
		Groundwater Flood	Groundwater flooding occurs when the natural underground drainage system cannot drain rainfall away quick enough, causing the water table to rise above the ground surface.
		Pluvial Flood	Pluvial flooding occurs when an extremely heavy rainfall saturates drainage systems and the excess water cannot be absorbed.
		Coastal Flood	Higher-than-normal water levels along the coast caused by tidal changes or thunderstorms that result in flooding, which can last from days to weeks.
		Glacial Lake Outburst	A flood that occurs when water dammed by a glacier or moraine is suddenly released.
		Ice Jam Flood	Type of flood occurring when an accumulation of floating ice restrict or block a river's flow and drainage.


Group	Type	Sub-type	Description
 <b>Natural</b>	<b>Storm</b>	Tropical Storm	e.g. cyclones, hurricanes and typhoons.
		Extra-Tropical Storm	e.g. European winter/windstorm and Nor'easter.
		Local/Convective Storm	e.g. Electrical storms or thunderstorms, rainstorms, windstorms, snowstorms and blizzard, tornadoes and dust and sandstorms.
		Geomagnetic Storm	Storm caused by solar wind shockwaves that temporarily disturb the Earth's magnetosphere. Geomagnetic storms can disrupt power grids, spacecraft operations, and satellite communications.
	<b>Wave Action</b>	Tsunami	High waves in ocean or in semi- or fully-enclosed bodies of water, such as lakes or bays, that may damage boats and coastal infrastructure, contributing to flooding and erosion. Usually generated by strong winds (e.g. ocean swells, rogue waves and seiches) or by underwater earthquakes, volcanic eruptions or landslides (e.g. tsunamis).
		High Swells & Rogue Waves	
		Seiche	

Group	Type	Sub-type	Description
 <b>Environmental</b>	<b>Water-Soil Degradation</b>	Soil Degradation	Soil degradation happens when the soil suddenly loses its value (in terms of nutrients, chemical make-up etc) as a result of acidification, over-farming, over-grazing, deforestation, desertification or erosion.
		Water Body Degradation	Water sudden physical changes, such as elevation of the temperature, discoloration, turbidity, siltation, depletion of oxygen (anoxia), salt-water intrusion and acidification, among others.
	<b>Air Pollution</b>	Sudden Pollution of the Air	Air pollution is the introduction of particulates, biological molecules, or other harmful materials into Earth's atmosphere, causing health issues and contributing to photochemical smog and acid rain, corrosion of buildings and damaging of trees and crops. Natural sources of Air pollution includes volcanic activity, methane from livestock, or dust from regions with little or no vegetation.
	<b>Erosion</b>	Sudden Inland Erosion	Natural temporary or permanent removal of soil or rock materials by the effect of rainfall (e.g., on riverbanks), wind, moving ice, and of infiltrating water that dissolves rock (e.g., in limestone and young volcanic ash geological formations). Coastal erosion further includes erosion due to the action of tides and sea waves.
		Sudden Coastal Erosion	
<b>Biodiversity Loss</b>	Biodiversity Loss	e.g. degradation of biodiversity, species extinction, major changes on species distribution.	

Group	Type	Sub-type	Description
 <b>Societal</b>	<b>Socio-Economic Shocks</b>	Economic Crisis	Economic crisis is an urgent and structural threat, at the regional and/or national levels, that necessitates urgent and alternative courses of action, but that also impacts the city's economic sector (e.g., inflation due to changes in oil-price, due to the decline of currencies, disruptions on import and export of goods and services).
		Financial Crisis	A sudden economic recession or depression caused by a lack of necessary liquidity in financial institutions. A financial crisis may be caused by natural disasters, negative economic news, or some other event with a significant financial impact. Financial crises tend to cause decreases in business activities, leading to a self-reinforcing intensification of the crisis.
	<b>Socio-Spatial Shocks</b>	Mass Immigration	Mass population immigration is the movement of people in the city, with the intention of settling in, temporarily or permanently. Mass Outward Displacement is its exact opposite, as movement of people goes out of the city.
		Mass Outward Displacement	
	<b>Socio-Cultural Shocks</b>	Destruction of Cultural Heritage	Destruction or desecration of cultural heritage or of sacred sites and symbols (e.g., temples, churches, sacred land and national symbols).
	<b>Socio-Political Shocks</b>	Political Crisis	Political crisis is an urgent and structural threat, at the local, regional and/or national political levels, that necessitates urgent and alternative courses of action, and that impacts the city's normal functioning.
<b>Crime</b>	Violent Crime	Sudden criminal events such as waves of violent personal crimes, waves of crimes against property, massacre or extermination.	

Group	Type	Sub-type	Description
 <b>Societal</b>	<b>Cyber-Attack</b>	Cyber-Attack	Cyber-attacks are offensive maneuvers, employed by individuals or organisations, directed at computers or other devices, or attacks where computers or other devices are integral to the offence. These include hacking, massive fraud and data theft, espionage, etc.
	<b>Terrorism</b>	Terrorism	Terrorism is the systematic use of terror, through violent acts or false alarms, exploiting human fear, as a way of trying to achieve political, ethnical, economic and/or religious goals. It may encompass biological, chemical, or bomb attacks, hijacking or shootings.
	<b>Conflict</b>	Urban Conflict	Conflict occurring in cities between different groups that may be caused by ethnicity, nationalism, religion, class or race.
		Inter-State Conflict	Conflict between state governments, potentially leading to war or armed conflict.

Group	Type	Sub-type	Description
 <b>Technological</b>	<b>Industrial &amp; Mining Incident</b>	Chemical Spill	Industrial and mining incidents encompass events such as the collapse, fire, explosion and primary radiation release from these sites and facilities, including the collapse of residual industrial and mining dams and landfills. It may happen due to accidents, negligence, incompetence, or has a consequence of another hazard (e.g., earthquakes). It further comprises chemical spills, gas leaks, oil spills, gas flaring and the poisoning of the environment due to industrial activities.
		Collapse	
		Explosion	
		Fire	
		Gas Leak	
		Oil Spill	
		Poisoning	
	Radiation		
	<b>Non-Industrial Incident</b>	Explosion	Non-industrial explosions include the explosion of old war munitions and of unexploded mines and ordnances (UXO).
		Urban Fire	Urban fires encompass uncontrolled fire within urban areas, affecting residential and/or commercial facilities.
		Transport Incident	Transport incidents encompass events caused by accidents, weather conditions, mechanical failure, incompetence or negligence, on air, road, railway and water. These include the transport of hazardous material such as fireworks, gases like LPG, fuels like diesel or petrol, acids and alkalis, industrial solvents, animal remedies, cleaning fluids and chemicals used in manufacturing.
	<b>Failure of Infrastructure &amp; Services</b>	Basic Infrastructure Breakdown	Breakdown or collapse of basic infrastructure, such as water, energy, solid waste, wastewater or communication systems.
		Built Infrastructure Breakdown	Collapse of the city's built environment, e.g. major damages on residential, commercial and public facilities and/or infrastructure.
Public Services Breakdown		Breakdown or collapse of public services, e.g. hospitals and clinics, emergency and rescue services, education facilities or social care services.	
Mobility System Breakdown		Breakdown or collapse of mobility system, including related infrastructure (e.g., bridge and tunnel collapses, breakdown of the city's railway), for systems based on water, air or land.	

Group	Type	Sub-type	Description
 <b>Complex</b>	<b>Failure of Supplies</b>	Food Crisis	A food crisis occurs when the population's access to appropriate quantities and quality of food and nutrition becomes inadequate or unreliable. It can encompass, besides food scarcity, natural and accidental events such as chemical, biological and foreign body food contamination.
		Water Crisis	A water crisis is a significant decline in the availability of acceptable quantity and quality of drinking water for both population (maintaining health and livelihoods) and economic activities. It can also encompass competition and conflicts situations over access to water, not only by different sectors (e.g., agriculture, industry and tourism) but also across boundaries (e.g., conflicts in transboundary river basins).
		Energy Crisis	An energy crisis is often a significant reduction in the supply and/or a substantial price increase of energy resources (e.g., electricity, fuel and gas). It may be caused by market fluctuations, limitations on free trade, nationalisation of energy companies, shortages or disruptions on the operation of energy producers and distribution networks (e.g., due to accidents or sabotage) and natural conditions (e.g., a severe winter).



# Selected List: Stresses and Stressors



The SDGs and NUA are frameworks targeting positive development that should be addressed at the local level.


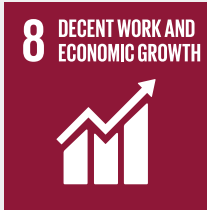
Using the SDGs and NUA frameworks as a basis, a list of stresses and stressors was defined by the CRPT. This comprehensive list serves as a starting selection and is open to additions or modifications based on local context.





SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG1</b></p>	<b>Concentrated Poverty</b>	<ul style="list-style-type: none"> <li>● Discrimination - multiple forms: racial/ religious/ gender/ ethnicity/ nationality</li> <li>● Uneven spatial distribution of opportunities</li> <li>● Spatial segregation/ Zoning impacts</li> <li>● Income inequality</li> <li>● forced eviction</li> <li>● Poverty</li> <li>● Social isolation - lack of access to social service</li> <li>● Unemployment</li> <li>● Lack of access to basic services including health</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Illiteracy</li> <li>● Gender inequity</li> <li>● Unhealthy economic growth and unemployment</li> <li>● Rapid and unregulated urbanization</li> <li>● Justices and security deficit</li> <li>...</li> </ul>
 <p><b>SDG2</b></p>	<b>Hunger and Malnutrition</b>	<ul style="list-style-type: none"> <li>● Inadequate food supply</li> <li>● Food dependency</li> <li>● Unsustainable and fragile agricultural farming methods and production</li> <li>● Lack of monitoring and food inspection</li> <li>● Poverty</li> <li>● Lack of access to agricultural lands</li> <li>● Lack of awareness rising on sustainable farming</li> <li>● Agricultural land degradation</li> <li>● Drought</li> <li>● Loss of agricultural land</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated poverty</li> <li>● Rapid and unregulated urbanization</li> <li>● Mismanagement of urban metabolism</li> <li>● Unhealthy economic growth and unemployment</li> <li>● Socio economic inequality</li> <li>● Ecosystem degradation</li> <li>...</li> </ul>



SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG3</b></p>	<p><b>Unhealthy and deprived environment</b></p>	<ul style="list-style-type: none"> <li>● Inadequate coverage of water and sanitation services</li> <li>● Inadequate coverage of health services</li> <li>● Inadequate capacity for awareness raising</li> <li>● Lack of monitoring and food inspection</li> <li>● Lack of monitoring of communicable diseases</li> <li>● Lack of access to water and sanitation services</li> <li>● Lack of access to basic health services</li> <li>● Developments in hazardous areas including contaminated/ polluted areas/ heavy industrial zones</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated poverty</li> <li>● Rapid and unregulated urbanization</li> <li>● Mismanagement of urban metabolism</li> <li>● Unhealthy economic growth and unemployment</li> <li>● Socio economic inequality</li> <li>● Ecosystem degradatio</li> <li>...</li> </ul>
 <p><b>SDG4</b></p>	<p><b>Illiteracy</b></p>	<ul style="list-style-type: none"> <li>● Inadequate coverage of education services</li> <li>● Inadequate physical capacity of education services/ facilities</li> <li>● Inadequate coverage of cultural activities/ facilities (e.g. libraries)</li> <li>● Lack of access to education services</li> <li>● Poverty</li> <li>● Lack of access to cultural activities</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Gender inequity</li> <li>● Unhealthy economic growth and Unemployment</li> <li>● Socio-economic inequality</li> <li>● Rapid and Unregulated urbanization</li> <li>● Lack of policies and institutional cohesion</li> <li>...</li> </ul>

SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG5</b></p>	<p><b>Gender inequity</b></p>	<ul style="list-style-type: none"> <li>● Gender-based discrimination</li> <li>● Normative/ legislative barriers</li> <li>● Poverty</li> <li>● Employment composition</li> <li>● Lack of access to education services</li> <li>● Lack of access to basic services including health</li> <li>● Lack of participation in decision making and implementation</li> <li>● Lack of awareness raising plans and policies</li> <li>● Mobility barriers</li> <li>● Socio-cultural norms</li> <li>● Displacement</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Hunger and Malnutrition</li> <li>● Illiteracy</li> <li>● Unhealthy economic growth and Unemployment</li> <li>● Socio-economic inequality</li> <li>● Rapid and Unregulated urbanization</li> <li>● Urban shrinkage</li> <li>● Inefficiency in the use of resources</li> <li>● Ecosystem degradation</li> <li>● lack of policies and institutional cohesion</li> <li>...</li> </ul>
 <p><b>SDG6</b></p>	<p><b>Mismanagement of urban metabolism</b></p>	<ul style="list-style-type: none"> <li>● Mismanagement of water cycles</li> <li>● Mismanagement of energy cycles</li> <li>● Mismanagement of solid waste</li> <li>● Mismanagement of food production and consumption cycles</li> <li>● Mismanagement of transportation</li> <li>● Mismanagement of urban logistics</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Hunger and Malnutrition</li> <li>● High dependency on non-clean energy</li> <li>● Unhealthy economic growth and Unemployment</li> <li>● Inefficiency in the use of resources</li> <li>● Ecosystem degradation</li> <li>● lack of policies and institutional cohesion</li> <li>...</li> </ul>

SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG7</b></p>	<p><b>High dependency on non-clean energy</b></p>	<ul style="list-style-type: none"> <li>● Lack of incentives for promoting the use of clean energy</li> <li>● Mismanagement of energy cycles</li> <li>● Inadequate public awareness raising</li> <li>● Unaffordable sources of clean energy</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Mismanagement of urban metabolism</li> <li>● Rapid and Unregulated urbanization</li> <li>● Urban shrinkage</li> <li>● Inefficiency in the use of resources</li> <li>● Ecosystem degradation</li> <li>● Lack of policies and institutional cohesion</li> <li>...</li> </ul>
 <p><b>SDG8</b></p>	<p><b>Unhealthy economic growth and Unemployment</b></p>	<ul style="list-style-type: none"> <li>● Inadequate economic diversification</li> <li>● Inadequate job opportunities</li> <li>● Economic stagnation (measured through the growth rate of GDP)</li> <li>● Inadequate economic diversification</li> <li>● Inadequate coverage of transportation system</li> <li>● Social isolation / local access of social networks</li> <li>● Lack of working skills</li> <li>● Discrimination - multiple forms: racial/ religious/ gender/ ethnicity/ nationality.</li> <li>● Precarious working environments</li> <li>● Lack of access to mobility systems</li> <li>● Economic/ financial crisis exceeding the city/ national level</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Hunger and Malnutrition</li> <li>● Illiteracy</li> <li>● Gender inequity</li> <li>● Fragile infrastructures</li> <li>● Unsustainable industrial development</li> <li>● Socio-economic inequality</li> <li>● Rapid and Unregulated urbanization</li> <li>● Urban shrinkage</li> <li>● Inefficiency in the use of resources</li> <li>● Ecosystem degradation</li> <li>● lack of policies and institutional cohesion</li> <li>...</li> </ul>

SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG9</b></p>	<b>Fragile infrastructures</b>	<ul style="list-style-type: none"> <li>● Aging infrastructure</li> <li>● Under-developed infrastructure</li> <li>● Low maintenance of infrastructure</li> <li>...</li> </ul>	
	<b>Unsustainable industrial development</b>	<ul style="list-style-type: none"> <li>● Lack of diversity in industries and manufacturing</li> <li>● Inadequate coverage of transportation system</li> <li>● Emission-intensive industries</li> <li>...</li> </ul>	
 <p><b>SDG10</b></p>	<b>Socio-economic inequity</b>	<ul style="list-style-type: none"> <li>● Economic exclusion</li> <li>● Social exclusion</li> <li>● Discrimination - multiple forms, including gender, ethnicity, religion, nationality</li> <li>● Spatial segregation / zoning</li> <li>● Income insecurity</li> <li>● Insecurity of tenure</li> <li>● Lack of access to social services</li> <li>● Lack of access to education services</li> <li>● Unemployment</li> <li>● Lack of access to mobility system</li> <li>● Informal economy</li> <li>● Displacement</li> <li>● Forced eviction</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Hunger and Malnutrition</li> <li>● Illiteracy</li> <li>● Gender inequity</li> <li>● High dependency on non-clean energy</li> <li>● Unhealthy economic growth and Unemployment</li> <li>● Rapid and Unregulated urbanization</li> <li>● Ecosystem degradation</li> <li>● lack of policies and institutional cohesion</li> <li>...</li> </ul>



SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG12</b></p>	<p><b>Inefficiency in the use of resources</b></p>	<ul style="list-style-type: none"> <li>● Unsustainable land consumption</li> <li>● Unnecessary changes of land use</li> <li>● Inadequate mixed use developments</li> <li>● Unsustainable consumption patterns</li> <li>● Lack of incentives including positive and negative ones for promoting energy efficiency (residential / commercial/ industrial)</li> <li>● Heavy reliance on distant sources of energy, water, food, materials</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Hunger and Malnutrition</li> <li>● Illiteracy</li> <li>● Mismanagement of urban metabolism</li> <li>● High dependency on non-clean energy</li> <li>● Unsustainable industrial development</li> <li>● Socio-economic inequality</li> <li>● Rapid and Unregulated urbanization</li> <li>● Urban shrinkage</li> <li>...</li> </ul>
   <p><b>SDG13, SDG 14 &amp; SDG15</b></p>	<p><b>Ecosystem degradation</b></p>	<ul style="list-style-type: none"> <li>● Poverty</li> <li>● Environmental degradation</li> <li>● Greenhouse gas emission</li> <li>● Deforestation</li> <li>● Black carbon emissions</li> <li>● Air pollution</li> <li>● Marine pollution</li> <li>● Inappropriate spatial location of hazardous industries</li> <li>● Noise</li> <li>● Coastal erosion</li> <li>● Forest fire</li> <li>● Mismanagement of solid waste</li> <li>● Mismanagement of waste water</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Hunger and Malnutrition</li> <li>● Illiteracy</li> <li>● Gender inequity</li> <li>● Mismanagement of urban metabolism</li> <li>● High dependency on non-clean energy</li> <li>● Unsustainable industrial development</li> <li>● Rapid and Unregulated urbanization</li> <li>● Inefficiency in the use of resources</li> <li>● lack of policies and institutional cohesion</li> <li>...</li> </ul>

SDGs	Stresses	Stressors	Interrelated Stresses
 <p><b>SDG16</b></p>	<p><b>Justice and security deficit</b></p>	<ul style="list-style-type: none"> <li>● Poverty</li> <li>● High rates of crime</li> <li>● Discrimination</li> <li>● Corruption</li> <li>● Economic exclusion</li> <li>● Gender inequity</li> <li>● Segregation</li> <li>● Socio-economic inequalities</li> <li>● Violence</li> <li>● Inadequate law enforcement</li> <li>● Proliferation of informal settlements</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Gender inequity</li> <li>● Unhealthy economic growth and Unemployment</li> <li>● Fragile infrastructures</li> <li>● Socio-economic inequality</li> <li>● Rapid and Unregulated urbanization</li> <li>● Ecosystem degradation</li> <li>● Lack of policies and institutional cohesion</li> <li>...</li> </ul>
 <p><b>SDG17</b></p>	<p><b>Lack of policies and institutional cohesion</b></p>	<ul style="list-style-type: none"> <li>● Inadequate risk reduction policies and measures</li> <li>● Lack of monitoring and evaluation of policies including risk reduction ones</li> <li>● Conflict of jurisdictions and competencies</li> <li>● Inadequate capacities of local government - Finance and human resources</li> <li>● Lack of mechanism for resource mobilization</li> <li>● Barriers to public participation in decision making especially to people in vulnerable situations</li> <li>...</li> </ul>	<ul style="list-style-type: none"> <li>● Concentrated Poverty</li> <li>● Illiteracy</li> <li>● Gender inequity</li> <li>● Socio-economic inequality</li> <li>● Justice and security deficit</li> <li>...</li> </ul>





# Appendix 4

## List of Stakeholders

# List of Stakeholders Type

Entity	Acronym	Type
Administração de Infra-estrutura de Água e Saneamento	AIAS	Public Entity
Administração Nacional das Áreas de Conservação	ANAC	Public Entity
Administração Nacional de Estradas	ANE	Public Entity
Administração Regional de Águas do Sul	ARA Sul	Public Entity
African Banking Corporation (Moçambique) SA	ABC	Private Entity
African Development Bank	AfDB	Other Major Institution
Agência Coreana de Cooperação Internacional	KOICA	Other Major Institution
Agência de Cooperação Internacional do Japão	JICA	Other Major Institution
Agência Dinamarquesa de Desenvolvimento Internacional	DANIDA	Other Major Institution
Agência dos Estados Unidos para o Desenvolvimento Internacional	USAID	Other Major Institution
Agência Internacional de Energia	AIE	Other Major Institution
Agência Italiana de Cooperação para o Desenvolvimento	AICD	Other Major Institution
Agência Metropolitana de Transportes	AMT	Public Entity
Agência Metropolitana do Grande Maputo	AMGM	Public Entity
Água de Moçambique	AdeM	Private Entity
Águas da Região de Maputo	ARM	Local Government
Arquitectos sem Fronteiras	ASF	Other Major Institution
Associação Criança, Família e Desenvolvimento	CFD	Civil Society Organization
Associação de Limpeza e Meio Ambiente	ALMA	Civil Society Organization
Associação de Mídias e Pequenas Empresas	AMPE	Civil Society Organization
Associação dos Conductores de Veículos e Motorizadas de Moçambique.	MOVECOA	Private Entity
Associação dos Transportadores Rodoviários de Maputo	ATROMAP	Civil Society Organization
Associação dos Urbanistas	AU	Civil Society Organization
Associação Internacional de Segurança Social	AISS	Other Major Institution
Associação Kulaia	AK	Civil Society Organization
Associação Médica de Moçambique	AMM	Other Major Institution
Associação Moçambicana de Energias Renováveis	AMER	Other Major Institution
Associação Moçambicana de Reciclagem	AMOR	Civil Society Organization
Associação Moçambicana dos Bancos	AMB	Other Major Institution
Associação Moçambicana para Vítimas de Insegurança Rodoviária	AMVIRO	Civil Society Organization
Associação Nacional dos Municípios de Moçambique	ANAMM	Other Major Institution
Associação PROGRESSO	AP	Civil Society Organization
Associações dos Productores	AP	Civil Society Organization
Autoridade Tributária de Moçambique	ATM	Public Entity
Banco Africano de Desenvolvimento	BAD	Other Major Institution
Banco Comercial e de Investimentos SA	BCI	Private Entity
Banco de Moçambique	BMoz	Public Entity
Banco Internacional de Moçambique SA.	BIM	Private Entity

Banco Mais	BM	Private Entity
Banco Mundial	WB	Other Major Institution
Banco Nacional de Investimento, SA	BNI	Private Entity
Banco Oportunidade de Moçambique, SA	BOM	Private Entity
Banco Terra, SA	BT	Private Entity
Banco Único, SA	BU	Private Entity
Caminhos de Ferro de Moçambique	CFM	Public Entity
Capital Bank, SA	CB	Private Entity
Care International	CARE	Civil Society Organization
Centro de Colaboração em Saúde	CCS	Other Major Institution
Centro de Prevenção e Controlo de Doenças	CPCD	Public Entity
Comissão Consultiva do Trabalho	CCT	Other Major Institution
Conselho de Regulação do Abastecimento de Água	CRA	Public Entity
Conselho Municipal de Maputo	CMM	Local Government
"Conselho Nacional de Segurança Alimentar e Nutricional"	CONSAN	Public Entity
"Conselho Nacional de Combate ao HIV/SIDA"	CNCS	Public Entity
Conselho Nacional de Electricidade	CNE	Public Entity
Conservation Finance Alliance	CFA	Other Major Institution
Cooperação Alemã	CA	Other Major Institution
Cooperação Alemã via KfW	KfW	Other Major Institution
Cooperação Irlandesa	CI	Other Major Institution
Cooperação Suíça para o Desenvolvimento	CSD	Other Major Institution
Coordinating Council for Disaster Management	CCGC	Public Entity
Cruz Vermelha de Moçambique	CVM	Other Major Institution
Department for International Development UK, British Cooperation	DFID	Other Major Institution
Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH	GIZ	Other Major Institution
Direcção da Saúde da Cidade de Maputo	DSCM	Local Government
Direcção Municipal de Gestão de Resíduos Sólidos Urbanos e Cemitérios. Protege os cemitérios da cidade de Maputo, apoio em pessoal técnico de aberturas de covas para o funeral.	DMGRSUC	Local Government
Direcção Nacional da Acção Social	DNAS	Public Entity
Direcção Nacional da Agricultura e Silvicultura	DNAS	Public Entity
Direcção Nacional da Criança	DNC	Public Entity
Direcção Nacional de Abastecimento de Água e Saneamento	DNAAS	Public Entity
Direcção Nacional de Águas	DNA	Public Entity
Direcção Nacional de Desenvolvimento Rural	DNDR	Public Entity
Direcção Nacional de Energias Novas e Renováveis	DNENR	Public Entity

Direcção Nacional de Terras e Florestas	DNTF	Public Entity
Direcção Nacional de Urbanização e Habitação	DNUH	Public Entity
Direcção Nacional dos Registos e Notariado	DNRN	Public Entity
Ecobank, SA	ECOBANK	Private Entity
Electricidade de Moçambique	EDM	Private Entity
Elizabeth Glaser Pediatric Aids Foundation	EGPAF	Private Entity
Embaixada do Reino dos Países Baixos	ERPB	Other Major Institution
Embassy of the United States of America	U.S. Embassy	Other Major Institution
Eskom	ESKOM	Private Entity
Fábrica de Bicicletas de Moçambique.	FBM	Private Entity
Famine Early Warning Systems Network	FEWS-Net	Other Major Institution
FNB Moçambique, SA	FNBM	Private Entity
Fundação para a Conservação da Biodiversidade	BIOFUND	Other Major Institution
Fundação para o Desenvolvimento da Comunidade	FDC	Other Major Institution
Fundo Africano de Desenvolvimento	FAD	Other Major Institution
Fundo das Nações Unidas para a Infância	UNICEF	Other Major Institution
Fundo de Desenvolvimento Artístico e Cultural	FDAC	Civil Society Organization
Fundo de Desenvolvimento Distrital	FDD	Public Entity
Fundo de Desenvolvimento dos Transportes e Comunicações	FDTC	Public Entity
Fundo de Energia	FUNAE	Public Entity
Fundo de Investimento e Património do Abastecimento de Água	FIPAG	Public Entity
Fundo Monetário Internacional	FMI	Other Major Institution
Fundo Mundial de Ambiente	GEF	Other Major Institution
Fundo Mundial para a Natureza	WWF	Other Major Institution
Fundo para o Fomento de Habitação	FHH	Public Entity
German Red Cross	DRK	Civil Society Organization
Global Conservation Fund	GCF	Other Major Institution
Global Facility for Disaster Reduction and Recovery	GDFRR	Other Major Institution
Global Fund	GF	Other Major Institution
Groundwater Monitoring in the SADC Region	IGRAC	Other Major Institution
Hidroeléctrica de Cahora Bassa	HCB	Public Entity
Inspeção da Justiça, Assuntos Constitucionais e Religiosos	IJACR	Public Entity
Instituto Nacional da Acção Social	INAS	Public Entity
Instituto Nacional das Comunicações de Moçambique	INCM	Public Entity
Instituto Nacional de Estatística	INE	Public Entity
Instituto Nacional de Gestão de Calamidades	INGC	Public Entity
Instituto Nacional de Meteorologia	INAM	Public Entity
Instituto Nacional do Seguro Social	INSS	Public Entity
Instituto Nacional dos Transportes Terrestres	INATTER	Public Entity

Instituto para Promoção das Pequenas e Médias Empresas	IPEME	Public Entity
Instituto Superior de Transportes e Comunicações	ISUTC	Private Entity
Joint United Nations Programme on HIV and AIDS	UNAIDS	Other Major Institution
Livaningo	LIVANINGO	Civil Society Organization
Malaria Consortium Mozambique	MC Moz	Civil Society Organization
Massa Crítica Maputo. Movimento dos Ciclistas.	CM	Civil Society Organization
Médicos Sem Fronteiras	MSF	Other Major Institution
Ministério da Administração Estatal e Função Pública	MAEFP	Public Entity
Ministério da Agricultura e Segurança Alimentar	MASA	Public Entity
Ministério da Cultura e Turismo	MCT	Public Entity
Ministério da Economia e Finanças	MEF	Public Entity
Ministério da Educação e Desenvolvimento Humano	MINEDH	Public Entity
Ministério da Energia	MOE	Public Entity
Ministério da Indústria e Comércio	MIC	Public Entity
Ministério da Justiça, Assuntos Constitucionais e Religiosos	MJACR	Public Entity
Ministério da Saúde	MISAU	Public Entity
Ministério da Terra, Ambiente e Desenvolvimento Rural	MITADER	Public Entity
Ministério das Finanças	MF	Public Entity
Ministério das Obras Públicas, Habitação e Recursos Hídricos	MOPHRH	Public Entity
Ministerio de Administração Pública	MAP	Public Entity
Ministério de Educação	ME	Public Entity
Ministério do Género, Criança e Acção Social	MGCAS	Public Entity
Ministério do Interior	MINT	Public Entity
Ministerio do Trabalho	MITRAB	Public Entity
Ministério do Trabalho, Emprego e Segurança Social	MTESS	Public Entity
Ministério dos Negócios Estrangeiros e Cooperação	MINEC	Public Entity
Ministerio dos Recursos Minerais e Energia	MIREME	Public Entity
Ministério dos Transportes e Comunicações	MTC	Public Entity
Ministério para a Coordenação da Acção Ambiental	MCAA	Public Entity
Moza Banco, SA	MB	Private Entity
Mozambique Aluminium Smelter	MOZAL	Private Entity
Mozambique Transmission Company	MOTRACO	Private Entity
National Centre of Cartography	CENACARTA	Public Entity
National Directorate of Environmental Management	DINAB	Public Entity
National Programme fo Malaria Control	PNCM	Public Entity
National Unit of Civil Protection	UNAPROC	Public Entity
Netherlands Embassy	NE	Other Major Institution
Norweigan Embassy	NOR	Other Major Institution
Nosso Banco	NB	Private Entity



Observatório do Meio Rural	OMR	Other Major Institution
Odebrecht, Empresa de Engenharia & Construção	Odebrecht	Private Entity
Operative National Centre for Emergencies	CENOE	Public Entity
Organização das Nações Unidas	ONU	Other Major Institution
Organização das Nações Unidas para a Educação, a Ciência e a Cultura	UNESCO	Other Major Institution
Organização das Nações Unidas para Agricultura e Alimentação	FAO	Other Major Institution
Organização dos Trabalhadores de Moçambique	OTM	Other Major Institution
Organização Internacional do Trabalho	OIT	Other Major Institution
Organização Mundial de Saúde (OMS)	WHO	Other Major Institution
Porto de Maputo	MPDC	Private Entity
Programa das Nações Unidas para o Desenvolvimento	PNUD	Other Major Institution
Rede de Organizações para a Soberania Alimentar	ROSA	Other Major Institution
Rede Moçambicana de Organizações contra a SIDA	MONASO	Civil Society Organization
Rede Uthende. Urban mobility reference.	RUTH	Private Entity
Save the Children	STC	Other Major Institution
Secretariado Técnico de Segurança Alimentar e Nutricional	SETSAN	Public Entity
Sir Motor, Empresa de negócios de transportes	Sir Motos	Private Entity
Sistema Estatístico Nacional	SEN	Public Entity
Societe Generale Moçambique	SGM	Private Entity
Socremo Banco de Microfinanças, SA	SBM	Private Entity
Standard Bank, SA	SB	Private Entity
Sweden Embassy	SE	Other Major Institution
Swedish International Development Agency	SIDA	Other Major Institution
Swiss Agency for Development and Cooperation	SDC	Other Major Institution
Technical Committee for Disaster Management	DNDR	Public Entity
Technical Secretariat of Food Security	SETSAN	Public Entity
The General Union of Agricultural and Livestock Cooperatives of Maputo	UGC	Civil Society Organization
UN Women	UNW	Other Major Institution
União Europeia	EU	Other Major Institution
União Internacional para Conservação da Natureza	IUCN	Other Major Institution
União Nacional de Camponeses	UNAC	Other Major Institution
United Nations	UN	Other Major Institution
United Nations Development Programme	UNDP	Other Major Institution
Universidade Eduardo Mondlane	UEM	Other Major Institution
Visão Mundial	VM	Other Major Institution
Water and Sanitation for the Urban Poors	WSUP	Other Major Institution
WaterAid	WaterAid	Other Major Institution
Waza, é um grupo de reflexão independente,	WAZA	Private Entity
World Food Programme, Programa Mundial de Alimentos (PMA)	WFP	Other Major Institution

List of  
Stakeholders  
Element

Elemento urbano	Classificação	Entidade	Sigla
		Conselho Municipal de Maputo	CMM
Built Environment	Essential	Ministério das Obras Públicas, Habitação e Recursos Hídricos	MOPHRH
Built Environment	Essential	Ministério da Terra, Ambiente e Desenvolvimento Rural	MITADER
Built Environment	Essential	Ministério da Administração Estatal e Função Pública	MAEFP
Built Environment	Essential	Administração Nacional de Estradas	ANE
Built Environment	Complementary	Associação Nacional dos Municípios Moçambicanos	ANAMM
Built Environment	Essential	Direcção Nacional de Urbanização e Habitação	DNUH
Built Environment	Essential	Arquitectos sem Fronteiras	ASF
Built Environment	Complementary	Fundo para o Fomento de Habitação	FHH
Built Environment	Essential	Direcção Nacional de Desenvolvimento Rural	DNDR
Built Environment	Complementary	Fundo de Desenvolvimento Distrital	FDD
Built Environment	Complementary	Ministro da Agricultura e Segurança Alimentar.	MASA
Built Environment	Complementary	Electricidade de Moçambique	EDM
Built Environment	Essential	Associação dos Urbanistas	AU
Built Environment	Essential	Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH	GIZ
Built Environment	Essential	World Bank	WB
Built Environment	Essential	Department for International Development UK, British Cooperation	DFID
Built Environment	Essential	United Nations	UN
Built Environment	Essential	Norwegian Embassy	NOR
Supply Chain and Logistics	Essential	Ministério da Saúde	MISAU
Supply Chain and Logistics	Essential	Ministério da Agricultura e Segurança Alimentar	MASA
Supply Chain and Logistics	Essential	Ministério dos Transportes e Comunicações	MTC
Supply Chain and Logistics	Essential	Ministério da Terra, Ambiente e Desenvolvimento Rural	MITADER
Supply Chain and Logistics	Essential	Ministério das Obras Públicas, Habitação e Recursos Hídricos	MOPHRH
Supply Chain and Logistics	Essential	Fundo de Investimento e Património do Abastecimento de Água	FIPAG
Supply Chain and Logistics	Essential	Águas da Região de Maputo	ARM
Supply Chain and Logistics	Essential	Administração Regional de Águas do Sul	ARA Sul
Supply Chain and Logistics	Essential	Instituto Nacional de Gestão de Calamidades	INGC
Supply Chain and Logistics	Essential	Direcção Nacional de Águas	DNA

Supply Chain and Logistics	Essential	Porto de Maputo. A Companhia de Desenvolvimento do Porto de Maputo	MPDC
Supply Chain and Logistics	Essential	Caminhos de Ferro de Moçambique	CFM
Supply Chain and Logistics	Essential	World Food Programme	WFP
Supply Chain and Logistics	Essential	Organização das Nações Unidas para a Alimentação e a Agricultura	FAO
Supply Chain and Logistics	Essential	Direcção Nacional da Agricultura e Silvicultura	DNAS
Supply Chain and Logistics	Essential	Administração Nacional de Estradas	ANE
Supply Chain and Logistics	Essential	Fundo de Energia	FUNAE
Supply Chain and Logistics	Essential	Hidroeléctrica de Cahora Bassa	HCB
Supply Chain and Logistics	Essential	Water and Sanitation for the Urban Poors	WSUP
Supply Chain and Logistics	Essential	Electricidade de Moçambique, E.P.	EDM
Supply Chain and Logistics	Essential	Organização Mundial da Saúde	OMS
Supply Chain and Logistics	Essential	União Européia	EU
Supply Chain and Logistics	Essential	Instituto Nacional das Comunicações de Moçambique	INCM
Supply Chain and Logistics	Essential	Direcção Nacional de Desenvolvimento Rural	DNDR
Supply Chain and Logistics	Essential	Cruz Vermelha de Moçambique	CVM
Supply Chain and Logistics	Essential	Fundo das Nações Unidas para a Infância	UNICEF
Supply Chain and Logistics	Essential	Ministerio dos Recursos Minerais e Energia	MIREME
Supply Chain and Logistics	Essential	Conselho Nacional de Electricidade	CNE
Supply Chain and Logistics	Essential	Administração de Infra-estrutura de Água e Saneamento	AIAS
Supply Chain and Logistics	Essential	Ministério da Energia	MOE
Supply Chain and Logistics	Essential	Direcção Nacional de Energias Novas e Renováveis	DNENR
Supply Chain and Logistics	Essential	Secretariado Técnico de Segurança Alimentar e Nutricional	SETSAN
Supply Chain and Logistics	Essential	Banco Mundial	WB
Supply Chain and Logistics	Essential	Água de Moçambique	AdeM
Supply Chain and Logistics	Complementary	Mozambique Transmission Company	MOTRACO
Supply Chain and Logistics	Complementary	Eskom	ESKOM
Supply Chain and Logistics	Complementary	Associações dos Productores	AP
Supply Chain and Logistics	Complementary	Association for the Victims of Road Insecurity	AMVIRO
Supply Chain and Logistics	Complementary	The General Union of Agricultural and Livestock Cooperatives of Maputo	UGC
Supply Chain and Logistics	Essential	WaterAid	WaterAid
Supply Chain and Logistics	Essential	União Nacional de Camponeses	UNAC
Supply Chain and Logistics	Complementary	Universidade Eduardo Mondlane	UEM
Supply Chain and Logistics	Complementary	Groundwater Monitoring in the SADC Region	IGRAC

Supply Chain and Logistics	Complementary	Observatório do Meio Rural	OMR
Basic Infrastructure	Essential	Ministério da Terra, Ambiente e Desenvolvimento Rural	MITADER
Basic Infrastructure	Essential	Ministério dos Transportes e Comunicações	MTC
Basic Infrastructure	Essential	Ministério das Obras Públicas, Habitação e Recursos Hídricos	MOPHRH
Basic Infrastructure	Essential	Fundo de Investimento e Património do Abastecimento de Água	FIPAG
Basic Infrastructure	Essential	Conselho de Regulação de Águas	CRA
Basic Infrastructure	Essential	Agência Coreana de Cooperação Internacional	KOICA
Basic Infrastructure	Essential	Agência de Cooperação Internacional do Japão	JICA
Basic Infrastructure	Essential	Fundo das Nações Unidas para a Infância	UNICEF
Basic Infrastructure	Complementary	Agência Dinamarquesa de Desenvolvimento Internacional	DANIDA
Basic Infrastructure	Essential	Fundo de Energia	FUNAE
Basic Infrastructure	Essential	Associação Nacional dos Municípios Moçambicanos	ANAMM
Basic Infrastructure	Essential	Direcção Nacional de Abastecimento de Água e Saneamento	DNAAS
Basic Infrastructure	Essential	Associação Moçambicana de Energias Renováveis	AMER
Basic Infrastructure	Essential	Direcção Nacional de Desenvolvimento Rural	DNDR
Basic Infrastructure	Complementary	Instituto Nacional das Comunicações de Moçambique	INCM
Basic Infrastructure	Essential	Administração Regional de Águas do Sul	ARA Sul
Basic Infrastructure	Essential	Direcção Nacional de Águas	DNA
Basic Infrastructure	Essential	Ministério das Finanças	MF
Basic Infrastructure	Essential	Ministerio dos Negocios Estrangeiros e Cooperacao	MNEC
Basic Infrastructure	Complementary	Ministério da Educação e Desenvolvimento Humano	MINEDH
Basic Infrastructure	Essential	Agência dos Estados Unidos para o Desenvolvimento Internacional	USAID
Basic Infrastructure	Essential	Ministerio dos Recursos Minerais e Energia	MIREME
Basic Infrastructure	Essential	WaterAid	WA
Basic Infrastructure	Essential	Visão Mundial	VM
Basic Infrastructure	Essential	Conselho de Regulação do Abastecimento de Água	CRA
Basic Infrastructure	Complementary	Ministério da Economia e Finanças	MEF
Basic Infrastructure	Essential	Mozambique Aluminium Smelter	MOZAL
Basic Infrastructure	Essential	Associação de Limpeza e Meio Ambiente	ALMA

Basic Infrastructure	Essential	Associação Moçambicana de Reciclagem	AMOR
Basic Infrastructure	Essential	Netherlands Embassy	NE
Basic Infrastructure	Essential	Banco Mundial	WB
Basic Infrastructure	Complementary	Agência Internacional de Energia	AIE
Mobility	Essential	Ministério dos Transportes e Comunicações	MTC
Mobility	Essential	Ministério da Administração Estatal e Função Pública	MAEFP
Mobility	Essential	Fundo de Desenvolvimento dos Transportes e Comunicações	FDTC
Mobility	Essential	Agência de Cooperação Internacional do Japão	JICA
Mobility	Essential	Banco Mundial	WB
Mobility	Complementary	Universidade Eduardo Mondlane	UEM
Mobility	Essential	Instituto Superior de Transportes e Comunicações	ISUTC
Mobility	Essential	UN Women	UNW
Mobility	Complementary	Administração Nacional de Estradas	ANE
Mobility	Essential	Waza, é um grupo de reflexão independente,	WAZA
Mobility	Essential	Associação dos Transportadores Rodoviários de Maputo	ATROMAP
Mobility	Essential	Livaningo	LIVANINGO
Mobility	Complementary	Instituto Nacional dos Transportes Terrestres - INATTER	INATTER
Mobility	Essential	Agência Metropolitana do Grande Maputo	AMGM
Mobility	Essential	Ministério das Finanças	MF
Mobility	Essential	Ministerio dos Negocios Estrangeiros e Cooperação	MNEC
Mobility	Essential	Ministério de Educação	ME
Mobility	Essential	Ministerio das Obras Públicas e Habitação	MOPHRH
Mobility	Essential	Agência Metropolitana de Transportes	AMT
Mobility	Complementary	Odebrecht, Empresa de Engenharia & Construção	Odebrecht
Mobility	Complementary	Sir Motor, Empresa de negócios de transportes	Sir Motos
Mobility	Complementary	Rede Uthende. Urban mobility reference.	RUTH
Mobility	Complementary	Fábrica de Bicicletas de Moçambique.	FBM
Mobility	Complementary	Associação Moçambicana para Vítimas de Insegurança Rodoviária	AMVIRO
Mobility	Essential	Associação dos Conductores de Veículos e Motorizadas de Moçambique.	MOVECOA
Mobility	Essential	Massa Crítica Maputo. Movimento dos Ciclistas.	CM

Mobility	Essential	Sweden Embassy	SE
Mobility	Essential	Agência Metropolitana de Barcelona	AMB
Mobility	Complementary	Banco Africano de Desenvolvimento	BAD
Mobility	Complementary	Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH	GIZ
Mobility	Complementary	Department for International Development UK, British Cooperation	DFID
Mobility	Essential	União Europeia	EU
Municipal Public Services	Essential	Ministério da Saúde	MISAU
Municipal Public Services	Essential	Ministério da Justiça e Assuntos Constitucionais e Religiosos	MJACR
Municipal Public Services	Essential	Ministério do Interior	MINT
Municipal Public Services	Essential	Ministério da Cultura e Turismo	MCT
Municipal Public Services	Essential	Organização Mundial de Saúde	OMS
Municipal Public Services	Essential	Organização das Nações Unidas para a Alimentação e a Agricultura	FAO
Municipal Public Services	Essential	Fundo das Nações Unidas para a Infância	UNICEF
Municipal Public Services	Essential	Banco Mundial	WB
Municipal Public Services	Essential	Associação Nacional dos Municípios de Moçambique	ANAMM
Municipal Public Services	Complementary	Associação Medica de Moçambique	AMM
Municipal Public Services	Complementary	Autoridade Tributária de Moçambique	ATM
Municipal Public Services	Essential	Direcção Nacional dos Registos e Notariado	DNRN
Municipal Public Services	Essential	Inspeccção da Justiça, Assuntos Constitucionais e Religiosos	IJACR
Municipal Public Services	Complementary	Instituto Nacional de Gestão de Calamidades	INGC
Municipal Public Services	Complementary	Organização Internacional do Trabalho	OIT
Municipal Public Services	Essential	Direcção de Saúde da cidade de Maputo	DSCM
Municipal Public Services	Essential	Centro de Colaboração em Saúde	CCS
Municipal Public Services	Essential	Direcção Municipal de Gestão de Resíduos Sólidos Urbanos e Cemitérios. Protege os cemitérios da cidade de Maputo, apoio em pessoal técnico de aberturas de covas para o funeral.	DMGRSUC
Municipal Public Services	Essential	Instituto Nacional de Estatística	INE
Municipal Public Services	Complementary	Administração Nacional de Estradas	ANE
Municipal Public Services	Essential	Instituto Nacional de Seguro Social	INSS
Municipal Public Services	Essential	Cruz Vermelha de Moçambique	CVM
Municipal Public Services	Essential	União Europeia	EU
Municipal Public Services	Essential	Ministério da Agricultura e Segurança Alimentar	MASA
Municipal Public Services	Essential	Ministério do Género, Criança e Acção Social	MGCAS

Municipal Public Services	Essential	Agência dos Estados Unidos para o Desenvolvimento Internacional (USAID)	USAID
Municipal Public Services	Essential	Ministerio de Administração Pública	MAP
Municipal Public Services	Essential	Ministério do Interior	MINT
Municipal Public Services	Essential	Ministerio do Trabalho	MITRAB
Municipal Public Services	Essential	Ministerio de Terra Desenvolvimento Rural	MITADER
Municipal Public Services	Essential	Ministerio das Obras Públicas e Habitação e Recursos Hidricos	MOPHRH
Municipal Public Services	Essential	Ministério de Económia e Finanças	MEF
Municipal Public Services	Complementary	Organização dos Trabalhadores de Moçambique	OTM
Municipal Public Services	Complementary	Associação dos produtores	AP
Municipal Public Services	Essential	Agência de Cooperação Internacional do Japão	JICA
Municipal Public Services	Essential	Universidade Eduardo Mondlane	UEM
Municipal Public Services	Complementary	Department for International Development UK, British Cooperation	DFID
Social Inclusion and Protection	Essential	Ministério do Género, Criança e Acção Social	MGCAS
Social Inclusion and Protection	Essential	Ministério da Justiça, Assuntos Constitucionais e Religiosos	MJACR
Social Inclusion and Protection	Essential	Ministério da Agricultura e Segurança Alimentar	MASA
Social Inclusion and Protection	Essential	Ministério da Educação	MEDH
Social Inclusion and Protection	Essential	Ministério da Saúde	MISAU
Social Inclusion and Protection	Essential	Banco Mundial	WB
Social Inclusion and Protection	Essential	Organização das Nações Unidas para Agricultura e Alimentação	FAO
Social Inclusion and Protection	Essential	Médicos Sem Fronteiras	MSF
Social Inclusion and Protection	Essential	Organização Mundial de Saúde (OMS)	WHO
Social Inclusion and Protection	Essential	Centro de Colaboração em Saúde	CCS
Social Inclusion and Protection	Essential	Direcção de Saúde da cidade de Maputo	DSCM
Social Inclusion and Protection	Essential	Save the Children	STC
Social Inclusion and Protection	Essential	Fundo das Nações Unidas para a Infância	UNICEF
Social Inclusion and Protection	Essential	Instituto Nacional da Acção Social	INAS
Social Inclusion and Protection	Essential	Instituto Nacional do Seguro Social	INSS
Social Inclusion and Protection	Essential	Direcção Nacional da Criança	DNC
Social Inclusion and Protection	Essential	Direcção Nacional da Acção Social	DNAS
Social Inclusion and Protection	Complementary	Associação Internacional de Segurança Social	AISS
Social Inclusion and Protection	Essential	Water Sanitation for the Urban Poor	WASUP
Social Inclusion and Protection	Complementary	Organização Internacional do Trabalho	OIT
Social Inclusion and Protection	Essential	Instituto Nacional de Gestão de Calamidades	INGC



Social Inclusion and Protection	Essential	Associação PROGRESSO	AP
Social Inclusion and Protection	Essential	Associação Kulaia	AK
Social Inclusion and Protection	Essential	"Conselho Nacional de Combate ao HIV/SIDA"	CNCS
Social Inclusion and Protection	Essential	Associação Criança, Família e Desenvolvimento	CFD
Social Inclusion and Protection	Essential	Rede de Organizações para a Soberania Alimentar	ROSA
Social Inclusion and Protection	Essential	Agência dos Estados Unidos para o Desenvolvimento Internacional	USAID
Social Inclusion and Protection	Essential	Ministerio das Obras Publicas e Habitacao	MOPHRH
Social Inclusion and Protection	Essential	Ministerio do Trabalho	MT
Social Inclusion and Protection	Essential	Direcção da Saúde da Cidade de Maputo	DSCM
Social Inclusion and Protection	Essential	"Conselho Nacional de Segurança Alimentar e Nutricional"	CONSAN
Social Inclusion and Protection	Essential	Centro de Prevenção e Controlo de Doenças	CPCD
Social Inclusion and Protection	Essential	Swiss Agency for Development and Cooperation	SDC
Social Inclusion and Protection	Essential	Department for International Development UK, British Cooperation	DFID
Social Inclusion and Protection	Essential	Joint United Nations Programme on HIV and AIDS	UNAIDS
Social Inclusion and Protection	Essential	African Development Bank	AfDB
Social Inclusion and Protection	Essential	Danish International Development Agency	DANIDA
Social Inclusion and Protection	Essential	United Nations Educational, Scientific and Cultural Organization	UNESCO
Social Inclusion and Protection	Essential	United Nations Development Programme	UNDP
Social Inclusion and Protection	Essential	Swedish International Development Agency	SIDA
Social Inclusion and Protection	Essential	World Food Programme, Programa Mundial de Alimentos (PMA)	WFP
Social Inclusion and Protection	Complementary	Cooperação Técnica Alemã	GTZ
Social Inclusion and Protection	Complementary	Elizabeth Glaser Pediatric Aids Foundation	EGPAF
Social Inclusion and Protection	Essential	Rede Moçambicana de Organizações contra a SIDA	MONASO
Social Inclusion and Protection	Essential	Embassy of the United States of America	U.S. Embassy
Social Inclusion and Protection	Essential	Agência Italiana de Cooperação para o Desenvolvimento	AICD
Social Inclusion and Protection	Essential	Cooperação Suíça para o Desenvolvimento	CSD
Social Inclusion and Protection	Essential	European Union	EU

Economy	Essential	Ministério da Indústria e Comércio	MIC
Economy	Essential	Ministério da Economia e Finanças	MEF
Economy	Essential	Ministério do Trabalho, Emprego e Segurança Social	MTESS
Economy	Complementary	Instituto Nacional do Seguro Social	INSS
Economy	Essential	Banco de Moçambique	BMoz
Economy	Essential	Banco Mundial	WB
Economy	Essential	Associação Moçambicana de Bancos	AMB
Economy	Complementary	Instituto Nacional de Acção Social	INAS
Economy	Complementary	Instituto Nacional de Estatística	INE
Economy	Essential	Fundo Monetário Internacional	FMI
Economy	Complementary	Fundação para o Desenvolvimento da Comunidade	FDC
Economy	Essential	Fundo Africano de Desenvolvimento	FAD
Economy	Essential	Organização dos Trabalhadores de Moçambique	OTM
Economy	Essential	Instituto para Promoção das Pequenas e Medias Empresas	IPEME
Economy	Essential	Programa das Nações Unidas para o Desenvolvimento	PNUD
Economy	Essential	Cooperação Alemã	CA
	Essential	Cooperação Irlandesa	CI
Economy	Essential	Embaixada do Reino dos Países Baixos	ERPBB
Economy	Complementary	Organização Internacional do Trabalho	OIT
Economy	Essential	Comissão Consultiva do Trabalho	CCT
Economy	Essential	Ministério do Género, Criança e Acção Social	MGCAS
Economy	Complementary	African Banking Corporation (Moçambique) SA	ABC
Economy	Essential	Organização das Nações Unidas	ONU
Economy	Essential	Banco Internacional de Moçambique SA.	BIM
Economy	Essential	Banco Comercial e de Investimentos SA	BCI
Economy	Essential	Standard Bank, SA	SB
Economy	Essential	Moza Banco, SA	MB
Economy	Essential	Banco Único, SA	BU
Economy	Essential	Banco Nacional de Investimento, SA	BNI
Economy	Essential	FNB Moçambique, SA	FNBM
Economy	Essential	Banco Terra, SA	BT
Economy	Essential	Ecobank, SA	ECOBANK
Economy	Essential	Capital Bank, SA	CB
Economy	Essential	Societe Generale Moçambique	SGM
Economy	Essential	Banco Oportunidade de Moçambique, SA	BOM
Economy	Essential	Socremo Banco de Microfinanças, SA	SBM

Economy	Essential	Banco Mais	BM
Economy	Essential	Nosso Banco	NB
Economy	Essential	Sistema Estatístico Nacional	SEN
Economy	Complementary	Ministério da Educação e Desenvolvimento Humano	MEDH
Economy	Essential	Fundo das Nações Unidas para a Infância	UNICEF
Economy	Complementary	Global Fund	GF
Economy	Essential	Agência dos Estados Unidos para o Desenvolvimento Internacional	USAID
Economy	Essential	Organização das Nações Unidas para a Educação, a Ciência e a Cultura	UNESCO
Economy	Essential	Ministério dos Negócios Estrangeiros e Cooperação	MINEC
Economy	Essential	Autoridade Tributária de Moçambique	ATM
Economy	Essential	Associação Nacional dos Municípios de Moçambique	ANAMM
Economy	Essential	Associação de Medias e Pequenas Empresas	AMPE
Economy	Essential	Associação Moçambicana dos Bancos	AMB
Ecology	Essential	Ministério da Terra, Ambiente e Desenvolvimento Rural	MITADER
Ecology	Essential	Ministério da Agricultura e Segurança Alimentar	MASA
Ecology	Essential	Instituto Nacional de Gestão de Calamidades	INGC
Ecology	Essential	Ministério da Cultura e Turismo	MCT
Ecology	Essential	Banco Mundial	WB
Ecology	Essential	Conselho de Regulação de Águas	CRA
Ecology	Essential	Fundo Mundial para a Natureza	WWF
Ecology	Essential	Associação Nacional dos Municípios Moçambicanos	ANAMM
Ecology	Essential	Livaningo	LIVANINGO
Ecology	Essential	Agência Dinamarquesa de Desenvolvimento Internacional	DANIDA
Ecology	Essential	Administração Regional de Águas do Sul	ARA Sul
Ecology	Essential	Fundação para a Conservação da Biodiversidade	BIOFUND
Ecology	Essential	Administração Nacional das Áreas de Conservação	ANAC
Ecology	Essential	Universidade Eduardo Mondlane	UEM
Ecology	Essential	Instituto Nacional de Meteorologia	INAM
Ecology	Essential	Direcção Nacional de Desenvolvimento Rural	DNDR
Ecology	Essential	Direcção Nacional de Terras e Florestas	DNTF
Ecology	Essential	União Europeia	EU

Ecology	Essential	Cruz Vermelha de Moçambique	CVM
Ecology	Essential	Direcção Nacional de Águas	DNA
Ecology	Essential	Fundo de Investimento e Património do Abastecimento de Água	FIPAG
Ecology	Essential	Ministério para a Coordenação da Acção Ambiental	MCAA
Ecology	Essential	Ministério das Finanças	MF
Ecology	Essential	Ministerio dos Negocios Estrangeiros e Cooperacao	MGEC
Ecology	Essential	Ministério das Obras Públicas, Habitação e Recursos Hídricos	MOPHRH
Ecology	Complementary	Conservation Finance Alliance	CFA
Ecology	Complementary	Global Conservation Fund	GCF
Ecology	Essential	Cooperação Alemã via KfW	KfW
Ecology	Essential	Ministério da Educação e Desenvolvimento Social	MEDH
Ecology	Essential	Ministério da Indústria e Comércio	MIC
Ecology	Essential	Fundo Mundial de Ambiente	GEF
Ecology	Essential	União Internacional para Conservação da Natureza	IUCN
Ecology	Essential	Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH	GIZ
Ecology	Complementary	Fundo de Desenvolvimento Artístico e Cultural	FDAC
Shocks – Floods, Cyclones and Droughts	Essential	National Institute for Disaster Management	INGC
Shocks – Floods, Cyclones and Droughts	Essential	Operative National Centre for Emergencies	CENOE
Shocks – Floods, Cyclones and Droughts	Essential	National Institute of Metereology	INAM
Shocks – Floods, Cyclones and Droughts	Essential	National Directorate of Environmental Management	DINAB
Shocks – Floods, Cyclones and Droughts	Essential	Minitstry of Land, Environment and Rural Development	MITADER
Shocks – Floods, Cyclones and Droughts	Essential	Ministry of Agriculture and Food Security	MASA
Shocks – Floods, Cyclones and Droughts	Essential	Ministry of State Administration and Public Functions	MAEFP
Shocks – Floods, Cyclones and Droughts	Essential	Coordinating Council for Disaster Management	CCGC
Shocks – Floods, Cyclones and Droughts	Essential	Technical Committee for Disaster Management	DNDR
Shocks – Floods, Cyclones and Droughts	Essential	National Unit of Civil Protection	UNAPROC
Shocks – Floods, Cyclones and Droughts	Essential	Technical Secretariat of Food Security	SETSAN

Shocks – Floods, Cyclones and Droughts	Essential	World Bank	WB
Shocks – Floods, Cyclones and Droughts	Essential	Global Facility for Disaster Reduction and Recovery	GDFRR
Shocks – Floods, Cyclones and Droughts	Essential	German Red Cross	DRK
Shocks – Floods, Cyclones and Droughts	Essential	Mozambican Red Cross	CVM
Shocks – Floods, Cyclones and Droughts	Essential	World Food Programme	WFP
Shocks – Floods, Cyclones and Droughts	Essential	United Nations Development Programme	UNDP
Shocks – Floods, Cyclones and Droughts	Complementary	Care International	CARE
Shocks – Floods, Cyclones and Droughts	Complementary	Universidade Eduardo Mondlane	UEM
Shocks – Floods, Cyclones and Droughts	Complementary	Famine Early Warning Systems Network	FEWS-Net
Shocks – Floods, Cyclones and Droughts	Complementary	National Centre of Cartography	CENACARTA
Shocks – Malaria	Essential	Ministry of Health	MISAU
Shocks – Malaria	Essential	National Programme fo Malaria Control	PNCM
Shocks – Malaria	Essential	National Institute for Disaster Management	INGC
Shocks – Malaria	Essential	World Bank	WB
Shocks – Malaria	Essential	United States Agency for International Development	USAID
Shocks – Malaria	Essential	Malaria Consortium Mozambique	MC Moz
Shocks – Malaria	Complementary	Universidade Eduardo Mondlane	UEM
Shocks – Heatwaves	Essential	Instituto Nacional de Meteorologia	INAM
Shocks – Heatwaves	Essential	Instituto Nacional de Gestão de Calamidade	INGC
Shocks – Heatwaves	Essential	Ministério da Terra, Ambiente e Desenvolvimento Rural	MITADER
Shocks – Heatwaves	Essential	Ministério da Agricultura e Segurança Alimentar	MASA
Shocks – Heatwaves	Essential	Operative National Centre for Emergencies	CENOE
Shocks – Heatwaves	Complementary	Cruz Vermelha de Moçambique	CVM
Shocks – Heatwaves	Essential	Japan International Cooperation Agency	JICA
Shocks – Heatwaves	Essential	European Union	EU
Shocks – Heatwaves	Essential	United Nations	UN
Shocks – Heatwaves	Essential	Food and Agriculture Organisation	FAO
Shocks – Heatwaves	Essential	World Food Programme	WFP

# Appendix 5

## **List of Policies, Plans and Initiatives**

<b>Category</b>	<b>PL:</b> Plan
	<b>IN:</b> Initiative
	<b>ES:</b> Studies/Other

<b>Validation</b>	<b>AP:</b> Approved
	<b>EP:</b> In process
	<b>NAP:</b> Not approved

<b>Scale</b>	<b>NAT:</b> National
	<b>SUP:</b> Supralocal
	<b>LOC:</b> Local
	<b>SUB:</b> Sublocal

<b>Publisher</b>	<b>AR:</b> Assembleia da República
	<b>AM:</b> Assembleia Municipal

## List of Policies, Plans and Initiatives

Name of Document	Year
<b>General Documents</b>	
Constituição da República de Moçambique (19 Novembro de 2004)	2004
Plano Quinquenal do Município (2014-2018)	2014/2018
Lei de Orgãos Locais do estado (LOLE)	
Lei das Autarquias (2/1997 de 18 de Fevereiro)	1997
Decreto de Transferencia de competencias às Autarquias (33/2008)	
Decreto 31/2012 de 8 de Agosto, Regulamento sobre o processo de reassentamento resultante de actividades economicas	
Directiva sobre o processo de expropriação para efeitos de Ordenamento Territorial, (Diploma Ministerial nº 181/2010 de 3 de Novembro)	
Diploma Ministerial 155/2014-Regulamento interno para o funcionamento da Comissão Técnica de Acompanhamento e Supervisão do Reassentamento;	
Diploma Ministerial 156/2014 – Directiva Técnica do Processo de Elaboração e Implementação dos Planos de Reassentamento.	
Quadro da Política de Reassentamento (QPR)	
<b>Disasters and Risks</b>	
Plano Director de RRD do INGC (2017-2030)	2017
Plano de contingencia da Província de Maputo (2015/2016)	2015
Plano municipal de adaptação às mudanças climáticas (2016-2018)	2016
Estratégia nacional de adaptação e mitigação de Mudanças Climáticas (2013-2025)	2012
Lei 15/2014 de 20 de Junho regimen jurídico da gestão de calamidades	2014
Decreto 7/2016 de 21 de Março, regulamento da Lei 15/2014	2016



Category	Validation	Scale	Publisher	Notes
	AP	NAT		
PL	AP	LOC		Este plano expirou, está-se à espera do novo plano quinquenal para o novo elenco (2019-2024)
LEI				
LEI	AP	NAT	Assamblea da República	Esta lei aprova o quadro jurídico para a implantação das autarquias locais
PL		NAT	INGC	
PL		LOC		
PL		LOC	CMM	
PL	AP	NAT	Cons Ministros	
LEI	AP	NAT	Ass. Republica	
LEI	AP	NAT	Ass. Republica	

## List of Policies, Plans and Initiatives

Name of Document	Year
<b>1. Built Environment</b>	
Lei de Terras (19/97 de 1 de Outubro)	
Regulamento da lei de Terras (66/98 de 8 de Dezembro)	
Anexo técnico ao Regulamento da lei de Terras (diploma ministerial 29-A2000 de 17 de Março)	
Resolução Municipal 113/2003, critérios atribuição DUATs	
Regulamento do solo urbano (Decreto 60/2006)	
Lei de ordenamento do território - LOT (Lei 19/2007 de 18 de Julho)	
Regulamento da LOT (Decreto 23/2008, de 1 de Julho)	
Regulamento geral de edificações urbanas (diploma legislativo 1976)	
Licenciamento de obras particulares (Decreto 2/2004, de 31 de Março)	
Diagnóstico da situação actual dos Als em Moçambique	
Estratégia de intervenção nos Als em Moçambique	
Estratégia municipal e metodologia de intervenção em Als	
Programa de Desenvolvimento Municipal de Maputo - PROMAPUTO (2007-2011), em duas etapas	
PROMAPUTO II (2011-2016)	
Resolução 19/2011, Aprova Política e estratégia de habitação, de 8 de Junho de 2011	
Plano de Estrutura Urbana do Município de Maputo (PEUMM)	
Programa nacional de ordenamento dos bairros / Guião do lançamento do programa	
Resolução Municipal 76/AM/2017 de 19 de Junho (Postura sobre construções e edificação)	
<b>3. Basic infrastructure</b>	
<b>Water - Water Supply</b>	
Política de Águas (Resolução 46/2007 de 30 de Outubro)	2007
Quadro de gestão delegada do abastecimento de água (Decreto 72/98 de 23 de Dezembro)	
Decreto 18/2009 de 13 de Maio (alarga a abrangência do quadro de gestão delegada)	
Decreto 19/2009 de 13 de Maio (Cria a Administração de infraestruturas de água e saneamento - AIAS)	
<b>Water - Wastewater and Sanitation</b>	
Plano Director de Saneamento 2018	2018
Despacho do MOPH de 7 de Outubro de 2005 (Obriga à recolha de águas pluviais em todos os edifícios públicos)	2005
<b>Water - Stormwater</b>	
Despacho do MOPH de 7 de Outubro de 2005 (Obriga à recolha de águas pluviais em todos os edifícios públicos)	2005
<b>Solid Waste</b>	
Decreto 94/2014 de 1 de Dezembro (Regulamento sobre a gestão de resíduos sólidos urbanos)	2014
Resolução 84/AM/2008 de 22 de Maio (Postura de limpeza de resíduos sólidos urbanos do Município de Maputo)	2008
Plano director em relação à GRSU	2017
Decreto 13/2006 de 15 de Junho (Regulamento sobre gestão de resíduos sólidos)	2006
Plan director municipal da Gestão de Resíduos sólidos urbanos da cidade de Maputo	2008
Decreto 12/2015 de 5 de Agosto (Regulamento sobre a gestão e controlo do saco plástico)	2015
Plano de gestão de resíduos sólidos do Distrito Municipal de Ka Maxakeni	2017

Category	Validation	Scale	Publisher	Notes
1997	Lei	AP	NAT	AR
1998	Reg	AP	NAT	AR
2000				
2003	RES	AP	LOC	AM
2006	Dip Min	AP	NAT	AR
2007				
2008	Dec	AP	NAT	AR
1960	Dip Legil	AP	LOC	Governador Geral
2004	Dec	AP	NAT	AR
2010	ESTR	N/A	NAT	MICOA
2010	OT		NAT	MICOA
2010	ESTR	AP	LOC	AM
2007				
2011				
2008				AM
2013	OT		NAT	MICOA
2017	RES	AP	LOC	AM
POL	AP	NAT	AR	
PL		LOC		Disponível só apresentação em pdf
		NAT	MOPH	
		NAT	MOPH	
REG	AP	NAT	AR	
RES MUN	AP	LOC	AM	
PL	EP	LOC		
REG	AP	NAT	AR	
PL	AP	LOC		
DEC	AP	NAT	AR	

## List of Policies, Plans and Initiatives

Name of Document	Year
<b>4. Mobility</b>	
Plano Director para o transporte no Grande Maputo (JICA 2014)	
<b>5. Municipal Public Services</b>	
<b>5.1. Cemeteries and Crematoriums</b>	
Regulamento sobre a Exumação de Corpos (Decreto N° 42/90 de 29 de Dezembro).	
<b>5.2. Civil Registration Services</b>	
Lei 12/2004 de 8 de Dezembro (aprova o código de registo civil)	2004
<b>6. Social Inclusion and Protection</b>	
<b>6.3.2. Access to Basic Social Services - Health</b>	
Levantamento da rede sanitária de Maputo (Medicus Mundi)	
Plano de desenvolvimento da rede sanitária de Maputo (Medicus Mundi + CMM)	
Plano director de saúde do CMM (2015-2019)	
<b>7. Economy</b>	
<b>7.1. Local Economic Structure</b>	
PERPU	
Finanças autárquicas	
<b>8. Ecology</b>	
Relatório final sobre a identificação, zoneamento e protecção de áreas ecológicamente sensíveis do município de Maputo	2013
Lei do Ambiente (Lei 20/97 de 1 de Outubro)	1997
Regulamento do processo de Avaliação de Impacto ambiental (54/2015 de 31 de Dezembro)	2015
Regulamento sobre o processo de auditoria medioambiental (25/2011 de 15 de Junho)	2011
Diploma ministerial 181/2010 de 3 de Novembro (processo de expropriação a efeitos de OT)	2010
O ecossistema da Baía de Maputo	2014

Category	Validation	Scale	Publisher	Notes
LEI	AP	NAT	AR	
ES		LOC		
LEI	AP	NAT	AR	
REG	AP	NAT	AR	
REG	AP	NAT	AR	
DIP MIN	AP	NAT	MICOA	
EST				









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## Recommendations of Actions for Resilience and Sustainability

### ASUNCIÓN

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This report details the findings, analysis, diagnosis, and commitment building, as well as the Recommendations of Actions for Resilience and Sustainability for the city of **Maputo**.