



**Workshop for Sharing of Knowledge on Solid Waste
Management
and
Preparatory Meeting for the Creation of an "African Clean Cities
Platform"**

**Improvement of the Efficiency in the Waste
Collection System**



25 April 2017
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Municipal Department of Health and Cemeteries



CONTEÚDO DA APRESENTAÇÃO



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4. Constraints and Perspectives
5. 3R Pilot Project 3R and others
6. Proposal for the New Collection Plan
(2017– 2027)
7. Conclusion



1. INTRODUÇÃO

Decree no. 94/2014 of 31 December dealing with the Management of Urban Solid Waste establishes that the Municipal Councils and Governments should:

- Ensure that municipal solid waste is not disposed of in places that could pose a danger to **public health and the environment**
- Ensure that **solid waste is not deposited or burned in the open air or in premises and equipment not licensed for that purpose;**
- Ensure that there are regulations on adequate annual recording of the provenance, quantities and types of waste handled, transported, treated, recovered or disposed of;

DMSC felt the need to prepare a Solid Waste Management Plan incorporated into the organic system of **CMM – THE MASTER PLAN**

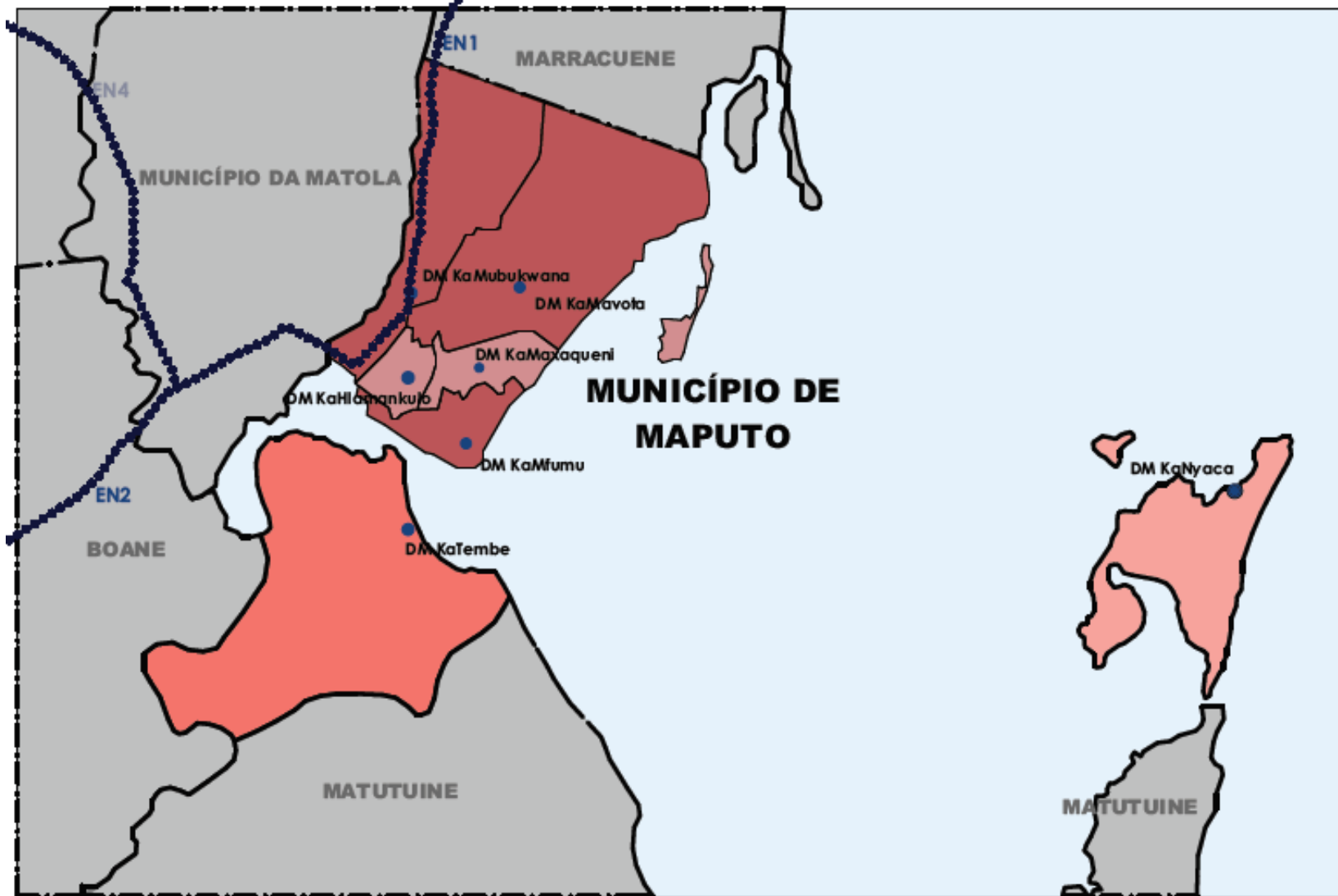


2. THE GENERAL OBJECTIVE

Improve the MSW Collection and Transportation Plan in Maputo City.



2.1 BACKGROUND: The Municipality of Maputo





2.2. Characteristics of Municipality of Maputo

Number of inhabitants and population growth in the city of Maputo

		Census of 2007	Census 2017 (Projection)
Distrito Municipal	Number of wards	Inhabitants 2007	Habitantes 2017
KaMpfumu	11	109 920	112 208
KaHlahamkulo	11	156 836	160 906
KaMaxakeni	08	227 290	233 309
KaMavota	11	297 657	359 268
KaMubukwana	12	294 967	379 025
KaTembe	05	19 668	22 699
KaNyaka	03	5 300	5 662
City of Maputo	61	1 111 638	1 273 076

Source: Updated 2007 Master Plan Information



2.4 Characteristics of Municipality of Maputo

Urban Area





2.5 Characteristics of Municipality of Maputo

Suburban Area





2.6 Characteristics of Municipality of Maputo

Suburban Area





2.7 Characteristics of Municipality of Maputo

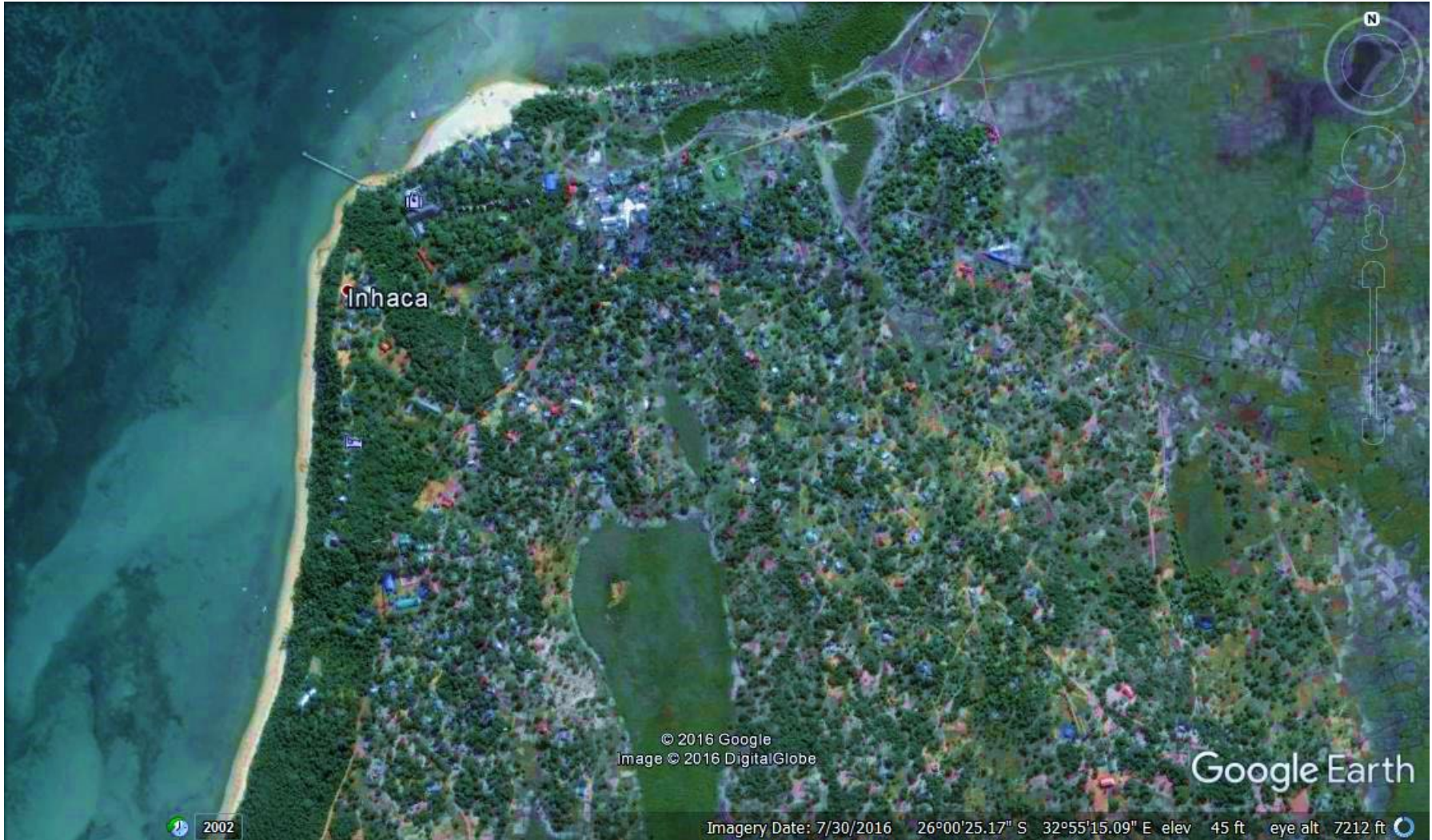
KATEMBE





2.7 Characteristics of Municipality of Maputo

KANYAKA





2.7 Characteristics of Municipality of Maputo

KATEMBE E KANYAKA

- Occupied dispersed areas; there are very few areas with a low density population
- Low population density;
- Living conditions are similar to those in rural areas (without drinking water or sanitation systems, without supply of electricity);
- Without a macro system of solid waste management;

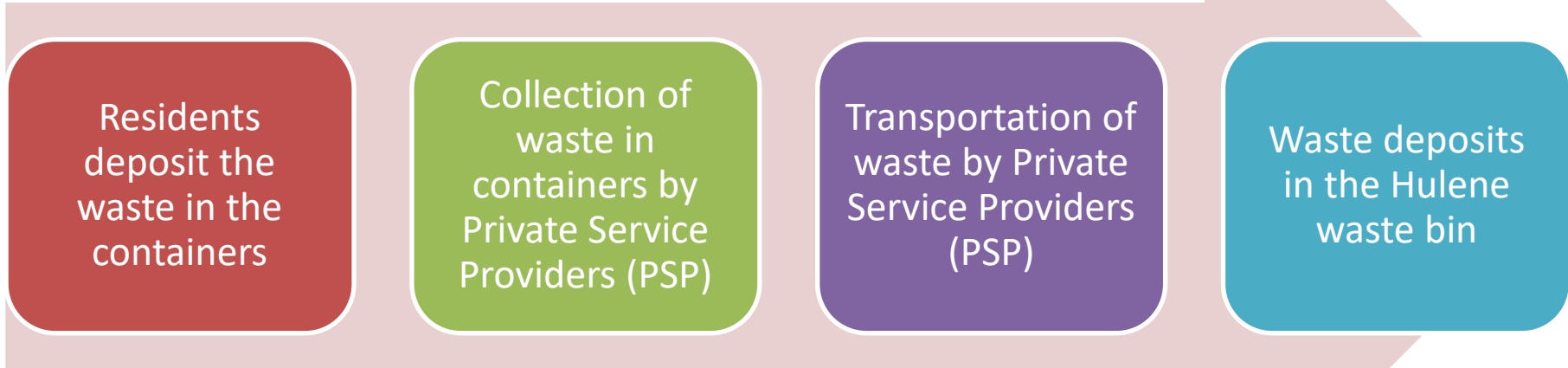


3. CURRENT SITUATION



MSW Collection and Transportation

3.1. Urban area



3.2. Suburban Area

Collection of RS
U by MEs
through the
door-to-door
system

Deposition in
existing
containers
distributed along
the public road

Collecting RS
from containers
by Private
Service Providers

Disposal of
waste in the
Hulene Landfill





3.3 KaTembe + KaNyaka



Collecting MSW
by Local
Administration

Deposition in
specific places,
or silos

.Collection of RS
by Local
Administration

Disposal of
waste in
Informal
Dumpsters





4. CONSTRAINTS AND PERSPECTIVES



4.1. Constraints

- Low level of environmental civic education on GRSU;
- Poor monitoring and control;
- Poor participation of citizens in the GSRU system;
- Failure to comply with the rules of operation of the GRSU Posture and Regulations;
- Lack of MSW segregation



4.2. Perspectives

- Reduction of MSW quantity for final deposition;
- Reduction of costs to solid waste management services;
- Intensify civic and environmental education and inspection;
- To increase the participation of the citizens in the process of the 3R's;
- Creation of a specific law that deals with MSW Recycling;
- Closing of the Hulene Municipal Landfill;
- Implementation of an MSW Transfer Station;
- The beginning of the Sanitary Landfill operations;
- Maputo - KaTembe Bridge, scheduled for 2018, the waste collection will be different and the waste can be transported to the Mathlemele landfill.



5. 3R AND OTHER PILOT PROJECTS



5.1 General Objective of Pilot Project

Improve the services of collection and transport of MSW in the urban area, providing a clean and healthy environment to the Municipalities.

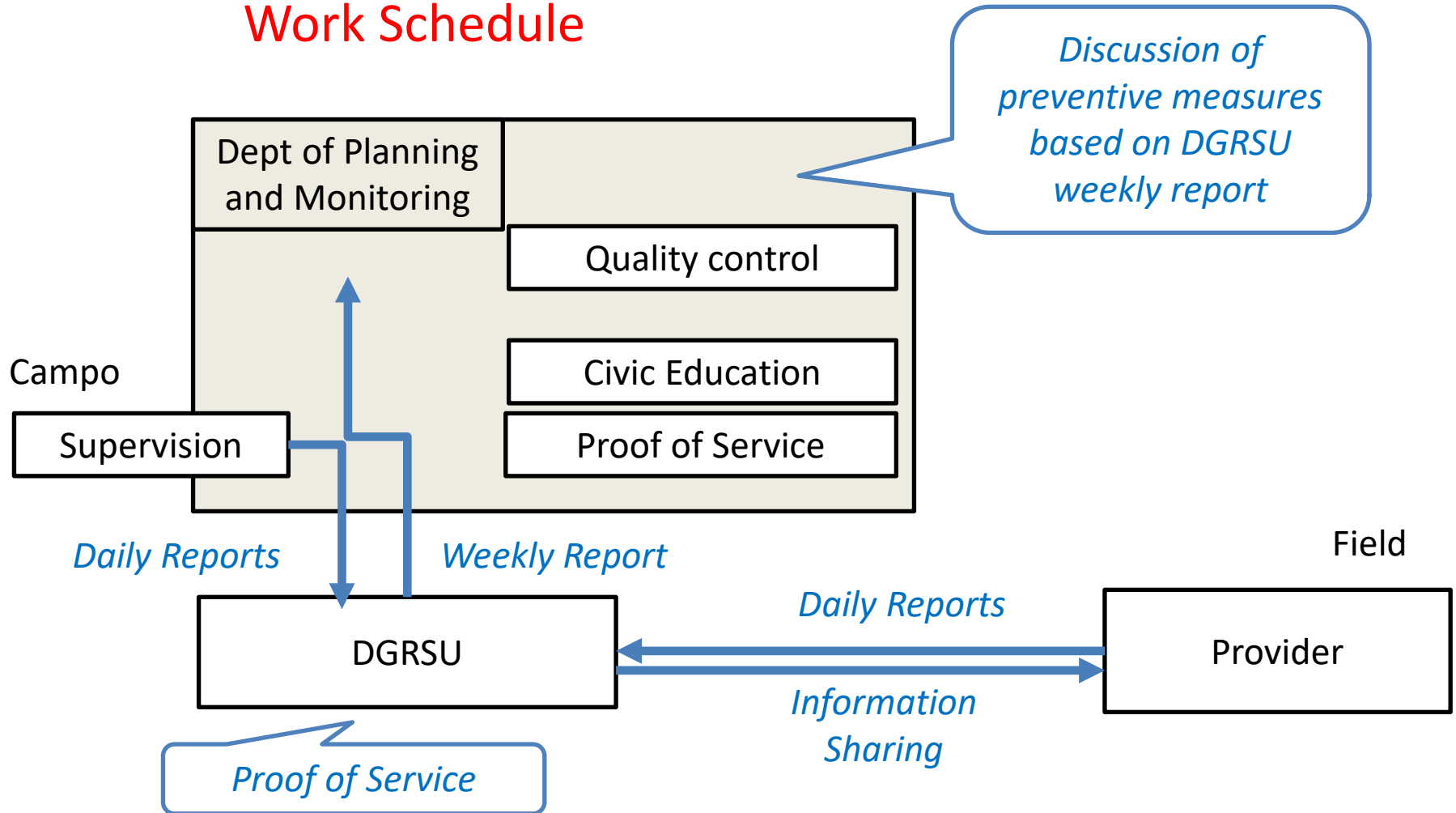
Specific

- Identify critical points;
- Identify the types of problems that occur most frequently;
- Improve the systematic approach to Ecolife routes



5.2 Flow of communication between the relevant departments for the P / P

Work Schedule





5.3 Classification of Problems



- A) Access to blocked container
- B) Garbage burning inside the container
- C) Trash out of container
- D) High amounts of commercial waste
- E) Unlawful Deposition
- F) Debris
- G) Scrap
- H) Branches
- I) Other [specify above]

Responsibility:

It is the responsibility of Ecolife (current private service provider) to remove MSW on the seven (7) routes that subdivide the city using compact type vehicles adapted to remove containers with a capacity of 1100 liters, 2.5 and 6m³.

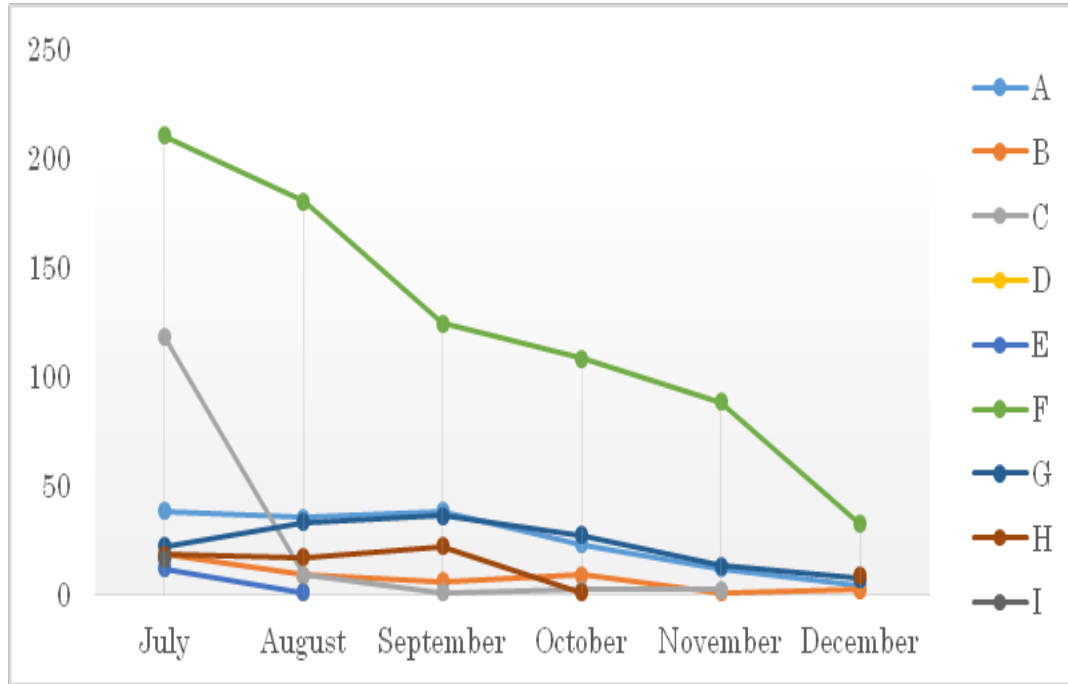


5.4 Findings

1. The most frequently observed problems are:
 - I. Debris (F), which is not solved by improving the efficiency of the collection
 - II. Scrap (G) and branches (H), which are not the solid waste that the supplier must collect, according to the contract
 - III. Burning of waste inside the containers (B) and trash outside the container (C) occur continuously
 - IV. For these problems, it is necessary to raise the awareness of residents and commercial establishments
 - V. In this sense, the quality control division as well as the GECPA of the DPM should be involved in the intervention.



5.5 Results of Monitoring (ECOLIFE)



A	Acesso ao contentor bloqueado
B	Queima de Lixo dentro do contentor
C	Lixo fora do contentor
D	Elevadas quantidades de resíduo comercial
E	Deposição ilegal
F	Entulho
G	Sucatas
H	Ramas
I	Outros



5.7 Monitoring using QGIS



The screenshot displays the QGIS 2.2.0-Valmiera interface. The main map area shows a georeferenced map of an urban area with several red heatspots indicating monitoring points. The left sidebar contains a 'Layers' panel with the following list:

- Monitor Fiscalizac 2016 01-04
- Monitor Fiscalizac 2016 01-05
- Monitor Fiscalizac 2016 01-06
- Monitor Fiscalizac 2016 01-07
- Mapa georeferenced
- B MF 2016 01 04
- C MF 2016 01 04
- C MF 2016 05
- C MF 2016 06
- C MF 2016 07
- E MF 2016 01 04
- E MF 2016 01 05
- E MF 2016 01 06
- F MF 2016 01 04
- F MF 2016 01 06
- F MF 2016 01 07
- G MF 2016 01 06
- I MF 2016 01 04
- I MF 2016 01 05
- I MF 2016 01 06
- I MF 2016 01 07
- Tudo MF 2016 01 04
- Tudo MF 2016 01 05
- Tudo MF 2016 01 06
- Tudo MF 2016 01 07

The status bar at the bottom shows the following information:

- Coordinate: 453564,7133070
- Scale: 147,483,648
- Render EPSG:4326



6. PROPOSAL

The Master Plan (2017-2027)



6.1 Key Aspects to Consider in Planning



- Monitor, evaluate and follow up the performance of service providers including primary collection;
- Fund the maintenance and updating of DGRSU resources including facilities as well as the human resources needed to deal with illegal disposal and some urgent needs;
- Plan efficient bus routes and vehicles, as well as the location of specific containers and timetable for collection;
- Civic education and intense and continuous awareness for separation at source.



6.1 Key Aspects to Consider in Planning

- Primary collection should be extended to all neighborhoods;
- It is probable that the inhabited area can be developed according to the urbanization plan, the option of collection and transportation should be analyzed before the second half of the implementation of this Master Plan;
- The collection is done by local initiatives eg tourist entities.



6.2 Strategy



Urban area

- Regular collection of MSW must be done by private company (s)
 - The mitigation function of illegal deposition and other problems should be maintained in DMSC
 - Introduction of a monitoring system of the existing problems by each zone is crucial (QGIS and Mopa).

Suburban Area

Changing the container system for secondary collection (transport);

- Development of the capacity of micro-enterprises in primary collection;
- Gradual introduction of separation at source, primary collection.



6.2 Strategy (cont.)

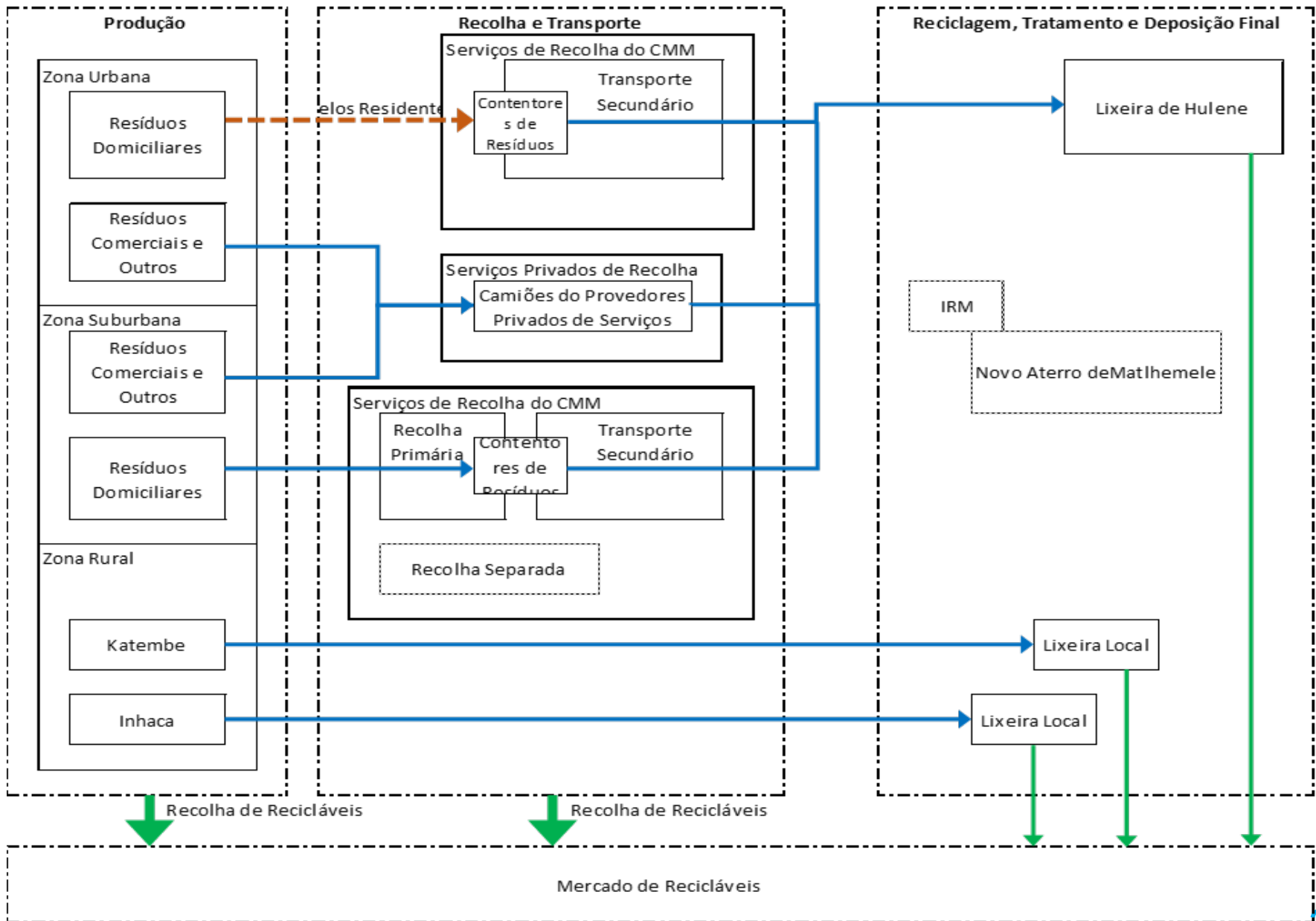


KaTembe and Inhaka:

- o sistema de recolha de resíduos em zonas habitacionais deverá ser mantido e melhorado.
- The primary collection should be extended to all districts of the District;
- After the start of operation of the Katembe bridge, the collected waste should be transported to the final disposal site of the municipality;
- the waste collection system in housing areas should be maintained and improved.

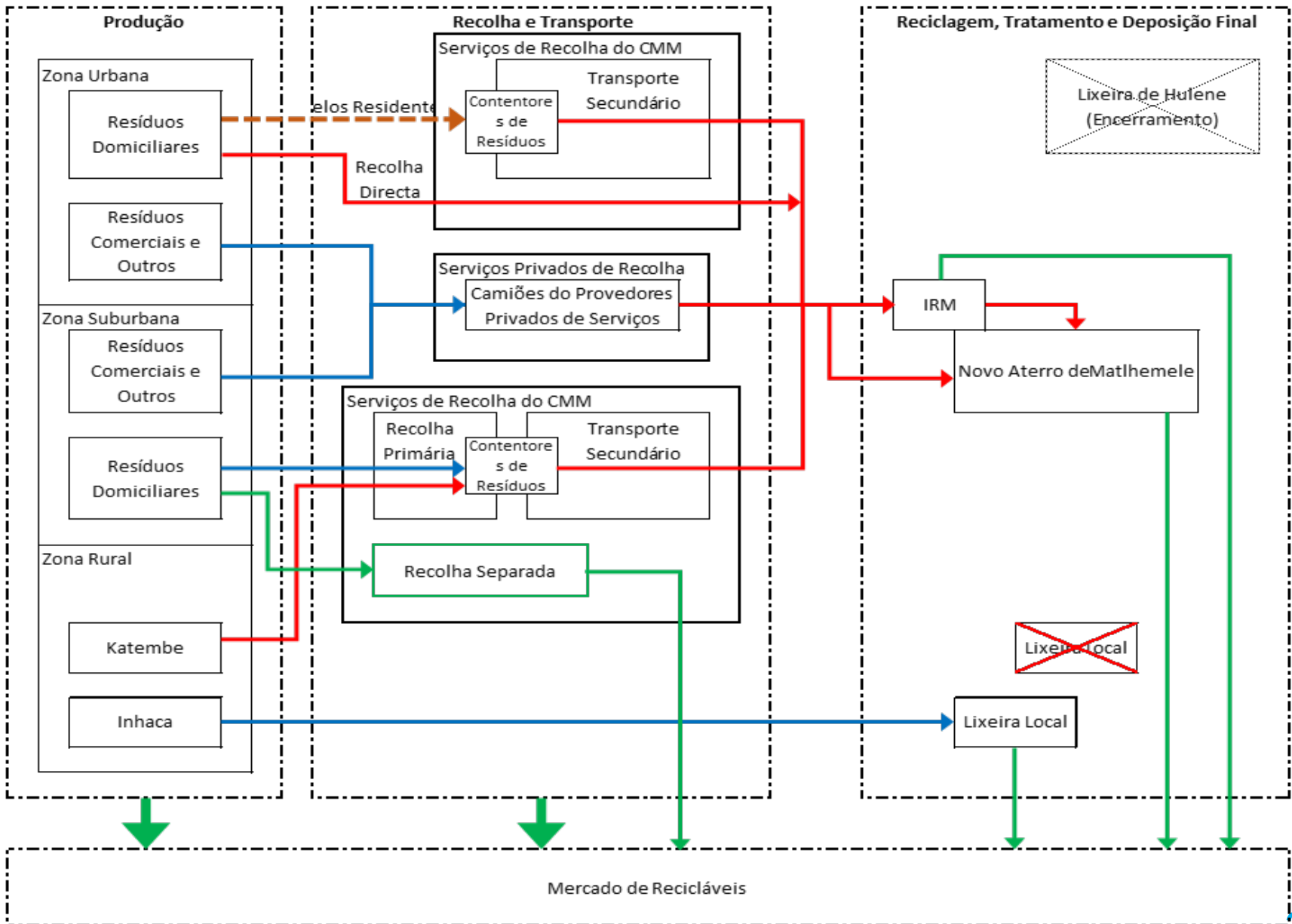


6.3 Flow of Waste in 2017





6.3 Waste stream in 2027 (cont.)





7. CONCLUSION

In view of the results obtained from the PP, it is necessary to define **monitoring measures and methods that can determine the effects of the intervention to mitigate** this type of problem, and it is necessary to **improve public awareness**, with the involvement of all actors.

It is necessary:

- **Reinforce penalization measures**, more vigorously on what waste is managed by the municipality and service providers.
- **Ensure registration and sharing of related information;**

These points will improve efficiency in the collection and transport of waste.



7. CONCLUSION (cont.)



It is assumed that the production of **solid waste is gradually increased and it is urgent to adopt more efficient measures coupled with better practices** in the management of urban solid waste.

The Master Plan appears as a document that will instruct the DMSC on the new approaches to be taken in order to reduce the amount of waste that arrives at final disposal.

In the coming years, we intend to invest in an efficient and efficient collection system, guaranteeing in the end a clean city



OTHER MONITORING SYSTEMS



Monitoring system

mopa



Participatory Monitoring of Urban Services

Maputo, 2015
www.mopa.co.mz



UX



5.8 Monitoring using MOPA

MOPA uses the principle of “**Citizens as Sensors**”. The residents and CSOs are motivated to participate in the observation and control of the provision of public services, Pilot 4 Districts in 2015, and its expansion to the entire municipality was in 2016 (excluding KaTembe and KaNyaka).

How to Report:

Code USSD *311# -Dial in any phone and follow the instructions–

Totalmente Grátis para o cidadão

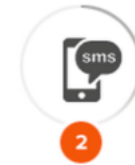
Application of MOPA – Download the (Citizen pay only for access application in Play store/Google Play **s to internet**)

Website: through the website www.mopa.co.mz (Citizen pay only for access to internet)



Detecta

Fica atento à acumulação de lixo no teu bairro



Reporta

Comunica problemas com o teu telemóvel ou através da internet



Acompanha

Visualiza a resolução de problemas através da internet

