

# **Appendices of Chapter 2.1**

## **Overall Activities**





## **Appendix 1-1**

PDM and PO (Versions 1~3)

## **Appendix 1-2**

Presentations of JCC meetings

## **Appendix 1-3**

Capacity Assessment Sheets

## **Appendix 1-4**

JICA Project Brief Note (Volumes 1~3)



# **Appendix 1-1**

## **PDM and PO (Versions 1~3)**



## Project Design Matrix (PDM)

Project title: Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo

Project duration: November 2019 – November 2022 (37 months)

Target group: Maputo City Council (CMM) and citizen of Maputo City

Target area: Maputo City (and Matola City for Output 4 and Output 7)

Version 1  
As of January 2020

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
<b>Overall Goal</b>			
Integrated solid waste management (ISWM) is established in a sustainable manner in Maputo City and the 'Maputo model' is disseminated to other cities.	1) MSW collection rate increases from ** % to ** %. (SDG 11.6.1) 2) MSW recycling rate increases from ** % to ** %. (SDG 12.5.1) 3) The concept of the 'Maputo Model' is disseminated inside/outside Mozambique.	1) 2) DSMAS Annual report 3) DSMAS Annual report, related materials of ACCP (Records of presentation at international conferences and media coverage)	· Activities defined by the 'Maputo model' will be continued by CMM/DSMAS.
<b>Project Purpose</b>			
The capacity for implementing ISWM is enhanced based on the SWM Master Plan (M/P) of Maputo City, and the capacity development experience is summarized under the name of the 'Maputo model'.	1) The progress rate of the SWM M/P implementation increase from **% at the beginning to **% at the end. 2) MSW collection service coverage is improved from **% at the beginning to **% at the end (SDG 11.6.1) 3) MSW recycling amount increase from ** ton at the beginning to ** ton at the end (SDG 12.5.1) 4) The average score of the capacity assessment at the organizational level shows an improvement from ** at the beginning to ** at the end. 5) The average score of the capacity assessment at the individual level shows an improvement from ** at the beginning to ** at the end. 6) The citizen's satisfaction and cooperation on SWM in Maputo City shows an improvement from ** at the beginning to ** at the end. 7) Draft regulation on source separation and the updating plan of ordinances and regulations on SWM is approved by CMM.	1) 2) 3) Project reports/DSMAS annual report, M/P 4) 5) Capacity assessment sheet 6) Social survey report 7) CMM report	· Policies, laws, and regulations on SWM will not be changed significantly. · Monitoring methods of SDG indicators are decided by the United Nations.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
<b>Outputs</b>			
1.The capacity for analyzing current issues and challenges of SWM in Maputo City is enhanced.	<ul style="list-style-type: none"> <li>· Action Plan for the M/P is prepared.</li> <li>· Monitoring System for the M/P is established.</li> <li>· Periodical monitoring on the revised M/P is implemented.</li> </ul>	<ul style="list-style-type: none"> <li>· Action Plan</li> <li>· Monitoring Plan</li> <li>· Monitoring Reports</li> </ul>	<ul style="list-style-type: none"> <li>· There is no significant change in the position of C/P personnel of the Project during the Project period.</li> </ul>
2.The capacity for supervising the waste collection and transportation service is enhanced.	<ul style="list-style-type: none"> <li>· The draft plan to optimize waste collection &amp; transportation service in Maputo City is prepared.</li> <li>· Revision of contracts with the WCSPs is proposed in accordance with the draft plan.</li> </ul>	<ul style="list-style-type: none"> <li>· Draft plan to optimize waste collection &amp; transportation service</li> <li>· Proposal on revision of contracts with the WCSPs</li> </ul>	
3.The capacity for minimizing waste generation and promoting 5Rs (Rethink, Refuse, Reduce, Reuse, Recycle) are strengthened.	<ul style="list-style-type: none"> <li>· The amount of recyclables recovery increased by XX% through the source separation PP.</li> <li>· Draft regulation on source separation is prepared.</li> <li>· The Recycle Forum is organized biannually.</li> </ul>	<ul style="list-style-type: none"> <li>· Record of recyclables recovery provided by recycling NGOs</li> <li>· Draft regulation on source separation</li> <li>· Record of recycling forums</li> </ul>	
4.The technical capacity for operation and management of final disposal is enhanced.	<ul style="list-style-type: none"> <li>· The guideline on sanitary landfill operation and management is prepared.</li> <li>· XX staff participates in the training on sanitary landfill operation and management.</li> </ul>	<ul style="list-style-type: none"> <li>· Guideline on sanitary landfill operation and management</li> <li>· Record of training</li> </ul>	
5.The financial, organizational, and institutional capacities in SWM are enhanced.	<ul style="list-style-type: none"> <li>· The financial plan for cost recovery on SWM is proposed.</li> <li>· The updating plan of ordinances and regulations on SWM is proposed.</li> <li>· The plan for organizational and human resource development in DSMAS is proposed.</li> </ul>	<ul style="list-style-type: none"> <li>· Plan for improving cost recovery on SWM</li> <li>· Plan for updating SWM ordinances</li> <li>· Plan for organizational and human resource development in DSMAS</li> </ul>	
6.The capacity for raising public awareness on the environment including waste issues and environmental education at various levels are strengthened.	<ul style="list-style-type: none"> <li>· The percentage of children/households who understand and act on 5Rs concept and garbage disposal rules increase by XX% through PPs for awareness-raising and environmental education.</li> <li>· Awareness-raising and environmental education activities are conducted XX times.</li> </ul>	<ul style="list-style-type: none"> <li>· Social survey report</li> <li>· DSMAS's report</li> </ul>	
7.The experience of realizing ISWM in Maputo city is summarized as the 'Maputo model' and disseminated to other cities.	<ul style="list-style-type: none"> <li>· The 'Maputo model' is compiled.</li> <li>· A dissemination plan of the 'Maputo model' is prepared.</li> <li>· A national seminar on the 'Maputo model' is organized.</li> </ul>	<ul style="list-style-type: none"> <li>· Explanatory document of 'Maputo model'</li> <li>· Dissemination plan of 'Maputo model'</li> <li>· Record of national seminar</li> </ul>	

Activities	Inputs	External Condition
1-1 Organize seminars and workshops for CMM officers to analyze and evaluate the current situation of SWM. 1-2 Grasp the current issues on SWM in Maputo city. 1-3 Review the implementation status of national policies regarding SWM. 1-4 Identify priority issues in the M/P and prepare the action plan for the M/P. 1-5 Establish the M/P monitoring system and start the M/P monitoring.	<b>Japanese Side</b> (1) Dispatch of JICA experts - Short-term experts a) Chief advisor /SWM /Final disposal b) Deputy chief advisor /3R policy promotion c) Solid waste collection, transportation, and reduction d) Organizational, financial and legal system analysis e) Project coordinator /Model compilation /SWM training - Long Term expert f) Public awareness /Model dissemination (2) Counterpart trainings (3) Equipment and materials (4) Local cost necessary for the project activities	· There is no significant delay in the construction plan for the new sanitary landfill site in Mathlemele.
2-1 Organize training, seminars, and workshops for CMM officers for supervising the waste collection service providers (WCSP). 2-2 Study the current situation of the WCSPs and their contracts. 2-3 Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area. 2-4 Examine revision of the contracts with the WCSPs for improving waste collection service. 2-5 Study monitoring and control system of waste collection service using ICT (Information and Communication Technology).		
3-1 Formulate a strategy for minimizing waste generation. 3-2 Plan appropriate source separation method and necessary rules. 3-3 Plan appropriate segregation method of hazardous waste from MSW. 3-4 Implement a pilot project (PP) for source separation to verify the feasibility of source separation. 3-5 Organize training course and workshop for supervision, guidance, and enforcement of PP. 3-6 Promote a market of recyclables for informal waste pickers (ex. junk shop or recycle station). 3-7 Networking among recycling industries in Mozambique. 3-8 Study incentive mechanism for promoting recycling (regulation, tax exemption, subsidy, etc.).	<b>Mozambique Side</b> (1) Counterparts to JICA experts a) assignment of counterpart personnel (C/Ps) b) facilities and equipment necessary for the project implementation c) office space for long-term expert and short-term experts' team, respectively d) necessary expenses for the activities (2) Others a) Salaries and other allowance for	
4-1 Prepare a guideline on landfill operational management including standard operation procedure (SOP) that can be utilized in the new sanitary landfill in Mathlemele. 4-2 Conduct training courses for workers on landfill operational management.		
5-1 Review, analyze and evaluate present financial management of SWM by CMM. 5-2 Propose a financial plan for ensuring the cost recovery of SWM by CMM. 5-3 Review, analyze and evaluate present organization and institution for SWM in CMM. 5-4 Propose a plan updating the ordinances and other institutions of CMM related to SWM. 5-5 Propose an organizational and human resource development plan for CMM/DSMAS.		
6-1 Organize a working group on public awareness and environmental education with Ministry of Land & Environment and MINEDH. 6-2 Review the current status of public awareness activities and environmental education in		

Activities	Inputs	External Condition
<p>Maputo City and Mozambique.</p> <p>6-3 Prepare program and action plans for public awareness and environmental education based on the review results.</p> <p>6-4 Produce public awareness and environmental education materials.</p> <p>6-5 Conduct public awareness-raising activities that contribute to the spread of the 5Rs concept through collaboration between students, citizens, and local community.</p> <p>6-6 Promote environmental education including the waste issue in schools in Maputo.</p>	<p>city and government officials</p> <p>b) Expenses for utilities such as electricity, water supply, and gas fuel</p> <p>c) Operational expenses for customs clearance, storage and domestic transportation for donated equipment from the Japanese side</p>	
<p>7-1 Summarize the experience of realizing ISWM in Maputo city as the "Maputo model".</p> <p>7-2 Prepare a dissemination plan of 'Maputo model' to the central and/or local governments in the coordination with Ministry of Land &amp; Environment including data collection of targeted cities.</p> <p>7-3 Start pilot dissemination with Matola City to identify necessary consideration in disseminating 'Maputo model' to other cities.</p> <p>7-4 Organize a national seminar on ISWM in cooperation with the National Solid Waste Management Federation (ANGER) and relevant organizations.</p>		<p><b>Pre-Condition</b></p> <ul style="list-style-type: none"> <li>· CMM will secure enough budget to implement the Project.</li> <li>· There is no significant change in policies and laws on SWM.</li> </ul>

ACCP: African Clean Cities Platform, JCC: Joint Coordination Committee, ISWM: Integrated Solid Waste Management, M/P: Master Plan, MSW: Municipal Solid Waste, PP: Pilot Project, SWM: Solid Waste Management, SDG: Sustainable Development Goals, WCSP: Waste Collection Service Provider  
ICR: Inception Report, PR: Progress Report, DFR: Draft Final Report, FR: Final Report



## Plan of Operation

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## Project Design Matrix (PDM)

Project title: Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo

Project duration: November 2019 – October 2023 (47 months)

Target group: Maputo City Council (CMM) and citizen of Maputo City

Target area: Maputo City (and Matola City for Output 4 and Output 7)

Version 2  
As of June 2022

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
<b>Overall Goal</b>			
Integrated solid waste management (ISWM) is established in a sustainable manner in Maputo City and the 'Maputo model' is disseminated to other cities.	1) MSW collection rate increases from ** % to ** %. (SDG 11.6.1) 2) MSW recycling rate increases from ** % to ** %. (SDG 12.5.1) 3) The concept of the 'Maputo Model' is disseminated inside/outside Mozambique.	1) 2) DSMAS Annual report 3) DSMAS Annual report, related materials of ACCP (Records of presentation at international conferences and media coverage)	· Activities defined by the 'Maputo model' will be continued by CMM/DSMAS.
<b>Project Purpose</b>			
The capacity for implementing ISWM is enhanced based on the SWM Master Plan (M/P) of Maputo City, and the capacity development experience is summarized under the name of the 'Maputo model'.	1) The progress rate of the SWM M/P implementation increases from 15% at the beginning to 67% at the end. 2) MSW collection service coverage (number of bairros where waste collection service is provided) is improved from 56 (89%) at the beginning to 58 (92%) at the end (SDG 11.6.1) 3) Amount of collected recyclables by source separation at CMM/DSMAS and the related organizations increases from 0 kg/month at the beginning to 100 kg/month at the end. (SDG 12.5.1) 4) The average score of the capacity assessment at the organizational level shows an improvement from 2.2 at the beginning to 3.5 at the end. 5) The average score of the capacity assessment at the individual level shows an improvement from 2.8 at the beginning to 4.0 at the end. 6) The citizen's satisfaction and cooperation on SWM in Maputo City shows an improvement from 70% (satisfaction) and 82% (cooperation) at the beginning to 80% (satisfaction) and 90% (cooperation) at the end.	1) M/P monitoring results  2) Project reports, DSMAS annual activity report  3) Monitoring results of the source separation pilot project  4) 5) Capacity assessment sheet  6) Social survey report	· Policies, laws, and regulations on SWM will not be changed significantly. · Monitoring methods of SDG indicators are decided by the United Nations.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
	7) Draft regulation on source separation and the updating plan of ordinances and regulations on SWM is approved by CMM.	7) CMM report	
<b>Outputs</b>			
1.The capacity for analyzing current issues and challenges of SWM in Maputo City is enhanced.	<ul style="list-style-type: none"> <li>· Action Plan for the M/P is prepared.</li> <li>· Monitoring System for the M/P is established.</li> <li>· Periodical monitoring on the revised M/P is implemented.</li> <li>· Mid-term review report of the M/P is prepared.</li> </ul>	<ul style="list-style-type: none"> <li>· Action Plan</li> <li>· Monitoring Plan</li> <li>· Monitoring Reports</li> <li>· M/P mid-term review report</li> </ul>	<ul style="list-style-type: none"> <li>· There is no significant change in the position of C/P personnel of the Project during the Project period.</li> </ul>
2.The capacity for supervising the waste collection and transportation service is enhanced.	<ul style="list-style-type: none"> <li>· The draft plan to optimize waste collection &amp; transportation service in Maputo City is prepared.</li> <li>· Revision of contracts with the WCSPs is proposed in accordance with the draft plan.</li> </ul>	<ul style="list-style-type: none"> <li>· Draft plan to optimize waste collection &amp; transportation service</li> <li>· Proposal on revision of contracts with the WCSPs</li> </ul>	
3.The capacity for minimizing waste generation and promoting 5Rs (Rethink, Refuse, Reduce, Reuse, Recycle) are strengthened.	<ul style="list-style-type: none"> <li>· More than 3 offices of CMM and the related organizations introduce the source separation PP.</li> <li>· Amount of collected recyclables by source separation at DSMAS doubles (30 kg/month) from the start of the pilot project.</li> <li>· Draft regulation on source separation is prepared.</li> <li>· The Recycle Forum is organized biannually.</li> </ul>	<ul style="list-style-type: none"> <li>· Monitoring results of the source separation pilot project</li> <li>· Draft regulation on source separation</li> <li>· Record of recycling forums</li> </ul>	
4.The technical capacity for operation and management of final disposal is enhanced.	<ul style="list-style-type: none"> <li>· The guideline on sanitary landfill operation and management is prepared.</li> <li>· More than 50 staff participates in the training on sanitary landfill operation and management.</li> </ul>	<ul style="list-style-type: none"> <li>· Guideline on sanitary landfill operation and management</li> <li>· Record of training</li> </ul>	
5.The financial, organizational, and institutional capacities in SWM are enhanced.	<ul style="list-style-type: none"> <li>· The financial plan for cost recovery on SWM is proposed.</li> <li>· The updating plan of ordinances and regulations on SWM is proposed.</li> <li>· The plan for organizational and human resource development in DSMAS is proposed.</li> </ul>	<ul style="list-style-type: none"> <li>· Plan for improving cost recovery on SWM</li> <li>· Plan for updating SWM ordinances</li> <li>· Plan for organizational and human resource development in DSMAS</li> </ul>	
6.The capacity for raising public awareness on the environment including waste issues and environmental education at various levels are strengthened.	<ul style="list-style-type: none"> <li>· The percentage of administrative officers who understand and act on 5Rs concept and garbage disposal rules increase from 11.5% (understanding) and 50.9% (behavior) at the beginning to 70% and 80% at the end.</li> </ul>	<ul style="list-style-type: none"> <li>· Social survey report</li> </ul>	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
	<ul style="list-style-type: none"> <li>· Awareness-raising and environmental education activities in which the Project is involved are conducted 20 times.</li> </ul>	<ul style="list-style-type: none"> <li>· Project reports</li> </ul>	
7.The experience of realizing ISWM in Maputo city is summarized as the 'Maputo model' and disseminated to other cities.	<ul style="list-style-type: none"> <li>· The 'Maputo model' is compiled.</li> <li>· A dissemination plan of the 'Maputo model' is prepared.</li> <li>· A national seminar on the 'Maputo model' is organized.</li> </ul>	<ul style="list-style-type: none"> <li>· Explanatory document of 'Maputo model'</li> <li>· Dissemination plan of 'Maputo model'</li> <li>· Record of national seminar</li> </ul>	

Activities	Inputs	External Condition
1-1 Organize seminars and workshops for CMM officers to analyze and evaluate the current situation of SWM. 1-2 Grasp the current issues on SWM in Maputo city. 1-3 Review the implementation status of national policies regarding SWM. 1-4 Identify priority issues in the M/P and prepare the action plan for the M/P. 1-5 Establish the M/P monitoring system (M/S) and start the M/P monitoring. 1-6 Update the A/P and the M/S in accordance with results of the M/P monitoring. 1-7 Prepare a mid-term review report of the M/P.	<b>Japanese Side</b> (1) Dispatch of JICA experts - Short-term experts a) Chief advisor /SWM /Final disposal b) Deputy chief advisor /3R policy promotion c) Solid waste collection, transportation, and reduction d) Organizational, financial and legal system analysis e) Project coordinator /Model compilation /SWM training - Long Term expert f) Public awareness /Model dissemination (2) Counterpart trainings (3) Equipment and materials (4) Local cost necessary for the project activities  <b>Mozambique Side</b> (1) Counterparts to JICA experts a) assignment of counterpart personnel (C/Ps)	<ul style="list-style-type: none"> <li>· There is no significant delay in the construction plan for the new sanitary landfill sites in Mathlemele and Katembe.</li> </ul>
2-1 Organize training, seminars, and workshops for CMM officers for supervising the waste collection service providers (WCSP). 2-2 Study the current situation of the WCSPs and their contracts. 2-3 Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area (including plans for waste transportation to Mathlemele and Katembe landfills and management of business waste). 2-4 Examine revision of the contracts with the WCSPs for improving waste collection service. 2-5 Study monitoring and control system of waste collection service using ICT (Information and Communication Technology).		
3-1 Formulate a strategy for minimizing waste generation. 3-2 Plan appropriate source separation method and necessary rules. 3-3 Plan appropriate segregation method of hazardous waste from MSW. 3-4 Implement a pilot project (PP) for source separation to verify the feasibility of source separation. 3-5 Organize training course and workshop for supervision, guidance, and enforcement of PP. 3-6 Promote a market of recyclables for informal waste pickers (ex. junk shop or recycle station). 3-7 Networking among recycling industries in Mozambique.		

Activities	Inputs	External Condition
3-8 Study incentive mechanism for promoting recycling (regulation, tax exemption, subsidy, etc.).	b) facilities and equipment necessary for the project implementation c) office space for long-term expert and short-term experts' team, respectively d) necessary expenses for the activities (2) Others a) Salaries and other allowance for city and government officials b) Expenses for utilities such as electricity, water supply, and gas fuel c) Operational expenses for customs clearance, storage and domestic transportation for donated equipment from the Japanese side	
4-1 Prepare a guideline on landfill operational management including standard operation procedure (SOP) that can be utilized in the new sanitary landfill in Mathleleme.		
4-2 Conduct training courses for workers on landfill operational management.		
5-1 Review, analyze and evaluate present financial management of SWM by CMM.		
5-2 Propose a financial plan for ensuring the cost recovery of SWM by CMM (including cleaning tax reform and charging system for business waste generators).		
5-3 Review, analyze and evaluate present organization and institution for SWM in CMM.		
5-4 Propose a plan updating the ordinances and other institutions of CMM related to SWM.		
5-5 Propose an organizational and human resource development plan for CMM/DSMAS.		
6-1 Organize a working group on public awareness and environmental education with Ministry of Land & Environment and MINEDH.		
6-2 Review the current status of public awareness activities and environmental education in Maputo City and Mozambique.		
6-3 Prepare program and action plans for public awareness and environmental education based on the review results.		
6-4 Produce public awareness and environmental education materials.		
6-5 Conduct public awareness-raising activities that contribute to the spread of the 5Rs concept through collaboration between students, citizens, and local community.		
6-6 Promote environmental education including the waste issue in schools in Maputo.		
7-1 Summarize the experience of realizing ISWM in Maputo city as the "Maputo model".		<b>Pre-Condition</b> · CMM will secure enough budget to implement the Project. · There is no significant change in policies and laws on SWM.
7-2 Prepare a dissemination plan of 'Maputo model' to the central and/or local governments in the coordination with Ministry of Land & Environment including data collection of targeted cities.		
7-3 Start pilot dissemination with Matola City to identify necessary consideration in disseminating 'Maputo model' to other cities.		
7-4 Organize a national seminar on ISWM in cooperation with the National Solid Waste Management Federation (ANGER) and relevant organizations.		

ACCP: African Clean Cities Platform, JCC: Joint Coordination Committee, ISWM: Integrated Solid Waste Management, M/P: Master Plan, A/P: Action Plan, M/S: Monitoring System, MSW: Municipal Solid Waste, PP: Pilot Project, SWM: Solid Waste Management, SDG: Sustainable Development Goals, WCSP: Waste Collection Service Provider

ICR: Inception Report, PR: Progress Report, DFR: Draft Final Report, FR: Final Report

## Plan of Operation

Activities	Schedule	2019		2020										2021												2022												2023											
		11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
Common Activities																																																	
· Capacity assessment and preparation of revised PDM and PO																																																	
· Holding Kick-off meeting and JCC																																																	
· C/Ps' training in abroad																																																	
· Dissemination to the partner and cooperating organizations																																																	
· Conducting project progress monitoring																																																	
· Preparation of ICR, PR, DFR and FR																																																	
[1]Output 1: The capacity for analyzing current issues and challenges of SWM in Maputo City is enhanced.																																																	
[1-1] Organize seminars and workshops for CMM officer to analyze and evaluate the current situation of SWM																																																	
[1-2] Grasp the current issues on SWM in Maputo City																																																	
[1-3] Review the implementation status of national policies regarding SWM																																																	
[1-4] Identify priority issues in the M/P and prepare the action plan for the M/P																																																	
[1-5] Establish the M/P monitoring system and start the M/P monitoring																																																	
[1-6] Update the A/P and the M/S in accordance with results of the M/P monitoring.																																																	
[1-7] Prepare a mid-term review report of the M/P.																																																	
[2]Output 2: The capacity for supervising the waste collection and transportation service is enhanced.																																																	
[2-1] Organize training, seminars, and workshops for CMM officers for supervising the WCSP																																																	
[2-2] Study the current situation of the WCSPs and their contracts																																																	
[2-3] Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area (including plans for waste transportation to Mathlemele and Katembe landfills and management of business waste).																																																	
[2-4] Examine revision of the contracts with the WCSPs for improving waste collection service																																																	
[2-5] Study monitoring and control system of waste collection service using ICT																																																	
[3]Output 3: The capacity for minimizing waste generation and promoting 5Rs are strengthened.																																																	
[3-1] Formulate a strategy for minimizing waste generation																																																	
[3-2] Plan appropriate source separation method and necessary rules																																																	
[3-3] Plan appropriate segregation method of hazardous waste from MSW																																																	
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[illegible]



## Project Design Matrix (PDM)

Project title: Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo

Project duration: November 2019 – October 2023 (47 months)

Target group: Maputo City Council (CMM) and citizen of Maputo City

Target area: Maputo City (and Matola City for Output 4 and Output 7)

Version 3  
As of July 2023

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
<b>Overall Goal</b>			
Integrated solid waste management (ISWM) is established in a sustainable manner in Maputo City and the 'Maputo model' is disseminated to other cities.	1) MSW collection rate increases from 95% to 97%. (SDG 11.6.1) 2) MSW recycling rate increases from 1.7 % to 5%. (SDG 12.5.1) 3) The concept of the 'Maputo Model' is disseminated inside/outside Mozambique.	1) 2) DSMAS Annual report 3) DSMAS Annual report, related materials of ACCP (Records of presentation at international conferences and media coverage)	· Activities defined by the 'Maputo model' will be continued by CMM/DSMAS.
<b>Project Purpose</b>			
The capacity for implementing ISWM is enhanced based on the SWM Master Plan (M/P) of Maputo City, and the capacity development experience is summarized under the name of the 'Maputo model'.	1) The progress rate of the SWM M/P implementation increases from 15% at the beginning to 67% at the end. 2) MSW collection service coverage (number of bairros where waste collection service is provided) is improved from 56 (89%) at the beginning to 58 (92%) at the end (SDG 11.6.1) 3) Amount of collected recyclables by source separation at CMM/DSMAS and the related organizations increases from 0 kg/month at the beginning to 100 kg/month at the end. (SDG 12.5.1) 4) The average score of the capacity assessment at the organizational level shows an improvement from 2.2 at the beginning to 3.5 at the end. 5) The average score of the capacity assessment at the individual level shows an improvement from 2.8 at the beginning to 4.0 at the end. 6) The citizen's satisfaction and cooperation on SWM in Maputo City shows an improvement from 70% (satisfaction) and 82% (cooperation) at the beginning to 80% (satisfaction) and 90% (cooperation) at the end.	1) M/P monitoring results  2) Project reports, DSMAS annual activity report  3) Monitoring results of the source separation pilot project  4) 5) Capacity assessment sheet  6) Social survey report	· Policies, laws, and regulations on SWM will not be changed significantly. · Monitoring methods of SDG indicators are decided by the United Nations.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
	7) Draft regulation on source separation and the updating plan of ordinances and regulations on SWM is approved by CMM.	7) CMM report	
<b>Outputs</b>			
1.The capacity for analyzing current issues and challenges of SWM in Maputo City is enhanced.	<ul style="list-style-type: none"> <li>· Action Plan for the M/P is prepared.</li> <li>· Monitoring System for the M/P is established.</li> <li>· Periodical monitoring on the revised M/P is implemented.</li> <li>· Mid-term review report of the M/P is prepared.</li> </ul>	<ul style="list-style-type: none"> <li>· Action Plan</li> <li>· Monitoring Plan</li> <li>· Monitoring Reports</li> <li>· M/P mid-term review report</li> </ul>	<ul style="list-style-type: none"> <li>· There is no significant change in the position of C/P personnel of the Project during the Project period.</li> </ul>
2.The capacity for supervising the waste collection and transportation service is enhanced.	<ul style="list-style-type: none"> <li>· The draft plan to optimize waste collection &amp; transportation service in Maputo City is prepared.</li> <li>· Revision of contracts with the WCSPs is proposed in accordance with the draft plan.</li> </ul>	<ul style="list-style-type: none"> <li>· Draft plan to optimize waste collection &amp; transportation service</li> <li>· Proposal on revision of contracts with the WCSPs</li> </ul>	
3.The capacity for minimizing waste generation and promoting 5Rs (Rethink, Refuse, Reduce, Reuse, Recycle) are strengthened.	<ul style="list-style-type: none"> <li>· More than 3 offices of CMM and the related organizations introduce the source separation PP.</li> <li>· Amount of collected recyclables by source separation at DSMAS doubles (30 kg/month) from the start of the pilot project.</li> <li>· Draft regulation on source separation is prepared.</li> <li>· The Recycle Forum is organized biannually.</li> </ul>	<ul style="list-style-type: none"> <li>· Monitoring results of the source separation pilot project</li> <li>· Draft regulation on source separation</li> <li>· Record of recycling forums</li> </ul>	
4.The technical capacity for operation and management of final disposal is enhanced.	<ul style="list-style-type: none"> <li>· The guideline on sanitary landfill operation and management is prepared.</li> <li>· More than 50 staff participates in the training on sanitary landfill operation and management.</li> </ul>	<ul style="list-style-type: none"> <li>· Guideline on sanitary landfill operation and management</li> <li>· Record of training</li> </ul>	
5.The financial, organizational, and institutional capacities in SWM are enhanced.	<ul style="list-style-type: none"> <li>· The financial plan for cost recovery on SWM is proposed.</li> <li>· The updating plan of ordinances and regulations on SWM is proposed.</li> <li>· The plan for organizational and human resource development in DSMAS is proposed.</li> </ul>	<ul style="list-style-type: none"> <li>· Plan for improving cost recovery on SWM</li> <li>· Plan for updating SWM ordinances</li> <li>· Plan for organizational and human resource development in DSMAS</li> </ul>	
6.The capacity for raising public awareness on the environment including waste issues and environmental education at various levels are strengthened.	<ul style="list-style-type: none"> <li>· The percentage of administrative officers who understand and act on 5Rs concept and garbage disposal rules increase from 11.5% (understanding) and 50.9% (behavior) at the beginning to 70% and 80% at the end.</li> </ul>	<ul style="list-style-type: none"> <li>· Social survey report</li> </ul>	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	External Conditions
	<ul style="list-style-type: none"> <li>· Awareness-raising and environmental education activities in which the Project is involved are conducted 20 times.</li> </ul>	<ul style="list-style-type: none"> <li>· Project reports</li> </ul>	
7.The experience of realizing ISWM in Maputo city is summarized as the 'Maputo model' and disseminated to other cities.	<ul style="list-style-type: none"> <li>· The 'Maputo model' is compiled.</li> <li>· A dissemination plan of the 'Maputo model' is prepared.</li> <li>· A national seminar on the 'Maputo model' is organized.</li> </ul>	<ul style="list-style-type: none"> <li>· Explanatory document of 'Maputo model'</li> <li>· Dissemination plan of 'Maputo model'</li> <li>· Record of national seminar</li> </ul>	

Activities	Inputs	External Condition
1-1 Organize seminars and workshops for CMM officers to analyze and evaluate the current situation of SWM. 1-2 Grasp the current issues on SWM in Maputo city. 1-3 Review the implementation status of national policies regarding SWM. 1-4 Identify priority issues in the M/P and prepare the action plan for the M/P. 1-5 Establish the M/P monitoring system (M/S) and start the M/P monitoring. 1-6 Update the A/P and the M/S in accordance with results of the M/P monitoring. 1-7 Prepare a mid-term review report of the M/P.	<b>Japanese Side</b> (1) Dispatch of JICA experts - Short-term experts a) Chief advisor /SWM /Final disposal b) Deputy chief advisor /3R policy promotion c) Solid waste collection, transportation, and reduction d) Organizational, financial and legal system analysis e) Project coordinator /Model compilation /SWM training - Long Term expert f) Public awareness /Model dissemination (2) Equipment and materials (3) Local cost necessary for the project activities	<ul style="list-style-type: none"> <li>· There is no significant delay in the construction plan for the new sanitary landfill sites in Mathlemele and Katembe.</li> </ul>
2-1 Organize training, seminars, and workshops for CMM officers for supervising the waste collection service providers (WCSP). 2-2 Study the current situation of the WCSPs and their contracts. 2-3 Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area (including plans for waste transportation to Mathlemele and Katembe landfills and management of business waste). 2-4 Examine revision of the contracts with the WCSPs for improving waste collection service. 2-5 Study monitoring and control system of waste collection service using ICT (Information and Communication Technology).	<b>Mozambique Side</b> (1) Counterparts to JICA experts a) assignment of counterpart personnel (C/Ps) b) facilities and equipment necessary	
3-1 Formulate a strategy for minimizing waste generation. 3-2 Plan appropriate source separation method and necessary rules. 3-3 Plan appropriate segregation method of hazardous waste from MSW. 3-4 Implement a pilot project (PP) for source separation to verify the feasibility of source separation. 3-5 Organize training course and workshop for supervision, guidance, and enforcement of PP. 3-6 Promote a market of recyclables for informal waste pickers (ex. junk shop or recycle station). 3-7 Networking among recycling industries in Mozambique.		

Activities	Inputs	External Condition
3-8 Study incentive mechanism for promoting recycling (regulation, tax exemption, subsidy, etc.).	for the project implementation c) office space for long-term expert and short-term experts' team, respectively d) necessary expenses for the activities (2) Others a) Salaries and other allowance for city and government officials b) Expenses for utilities such as electricity, water supply, and gas fuel c) Operational expenses for customs clearance, storage and domestic transportation for donated equipment from the Japanese side	
4-1 Prepare a guideline on landfill operational management including standard operation procedure (SOP) that can be utilized in the new sanitary landfill in Mathleleme.		
4-2 Conduct training courses for workers on landfill operational management.		
5-1 Review, analyze and evaluate present financial management of SWM by CMM.		
5-2 Propose a financial plan for ensuring the cost recovery of SWM by CMM (including cleaning tax reform and charging system for business waste generators).		
5-3 Review, analyze and evaluate present organization and institution for SWM in CMM.		
5-4 Propose a plan updating the ordinances and other institutions of CMM related to SWM.		
5-5 Propose an organizational and human resource development plan for CMM/DSMAS.		
6-1 Organize a working group on public awareness and environmental education with Ministry of Land & Environment and MINEDH.		
6-2 Review the current status of public awareness activities and environmental education in Maputo City and Mozambique.		
6-3 Prepare program and action plans for public awareness and environmental education based on the review results.		
6-4 Produce public awareness and environmental education materials.		
6-5 Conduct public awareness-raising activities that contribute to the spread of the 5Rs concept through collaboration between students, citizens, and local community.		
6-6 Promote environmental education including the waste issue in schools in Maputo.		
7-1 Summarize the experience of realizing ISWM in Maputo city as the "Maputo model".		<b>Pre-Condition</b> <ul style="list-style-type: none"> <li>· CMM will secure enough budget to implement the Project.</li> <li>· There is no significant change in policies and laws on SWM.</li> </ul>
7-2 Prepare a dissemination plan of 'Maputo model' to the central and/or local governments in the coordination with Ministry of Land & Environment including data collection of targeted cities.		
7-3 Start pilot dissemination with Matola City to identify necessary consideration in disseminating 'Maputo model' to other cities.		
7-4 Organize a national seminar on ISWM in cooperation with the National Solid Waste Management Federation (ANGER) and relevant organizations.		

ACCP: African Clean Cities Platform, JCC: Joint Coordination Committee, ISWM: Integrated Solid Waste Management, M/P: Master Plan, A/P: Action Plan, M/S: Monitoring System, MSW: Municipal Solid Waste, PP: Pilot Project, SWM: Solid Waste Management, SDG: Sustainable Development Goals, WCSP: Waste Collection Service Provider

ICR: Inception Report, PR: Progress Report, DFR: Draft Final Report, FR: Final Report

## Plan of Operation

[illegible]

[illegible]

# **Appendix 1-2**

## **Presentations of JCC meetings**





**AGENDA of the 1<sup>st</sup> Joint Coordination Committee Meeting**

- Date: 31<sup>st</sup> January 2020 (Friday)
- Time: 9:00 to 12:00
- Venue: CMM Training Center @DSMAS
- Agenda:

<b>Time</b>	<b>Agenda</b>	<b>Presenter/in-charge</b>
8:30-9:00	<i>Registration</i>	DSMAS/JET
9:00-9:10 (10 min)	Introduction of participants	Mr. Sergio, Head of Department at DSMAS
9:10-9:20 (10 min)	Opening remarks by CMM	Mr. Nicol's, Vereador of CMM
9:20-9:30 (10 min)	Opening remarks by JICA	Ms. Nishinoiri, Deputy chief representative of JICA Mozambique office
9:30-9:45 (15 min)	Explanation of the Inception Report	Ms. Stela, Deputy director of DSMAS
9:45-10:00 (15 min)	JICA's approach of capacity development on solid waste management in Africa	Ms. Kojima, Long term expert of JET
10:00-10:20 (20 min)	Proposal on modification of PDM and PO	Mr. Hosono, Chief adviser of JET
10:20-10:40	<i>Tea/coffee break and free discussion</i>	JET/DSMAS
10:40-10:55 (15 min)	Progress on Mathlemele sanitary landfill construction project	FNDS, MITADER
10:55-11:10 (15 min)	Current situation and challenge of MSWM in Maputo city	Ms. Teresa, Deputy director of DSMAS
11:10-11:50 (40 min)	Overall discussion	All/ Mr. Domingos, Director of DSMAS
11:50-12:00 (10 min)	Closing remarks by CMM	Mr. Nicol's Vereador of CMM

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# The Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo

“Project Outline of the Inception Report”

Maputo, January 2020  
Meriamo Stela Novela

## Purpose

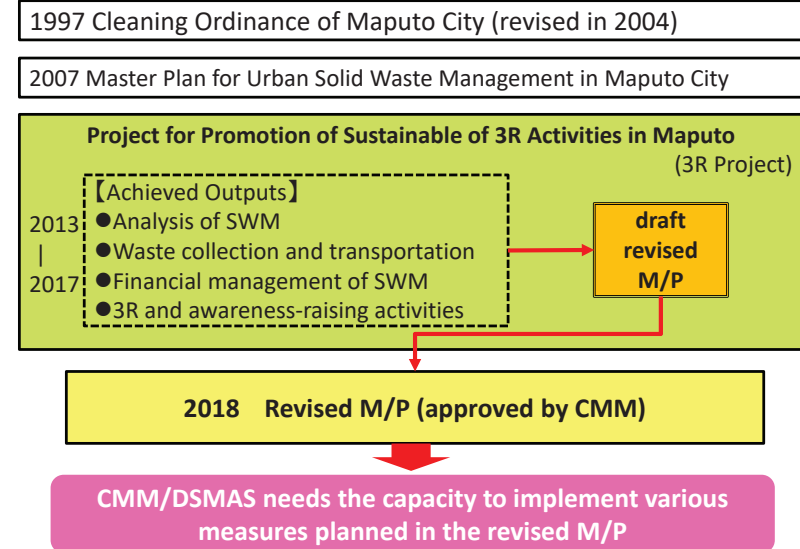
### General Purpose

Integrated Management of Solid Waste (ISWM) established in a sustainable way in Maputo City and the “Maputo Model” disseminated in other cities.

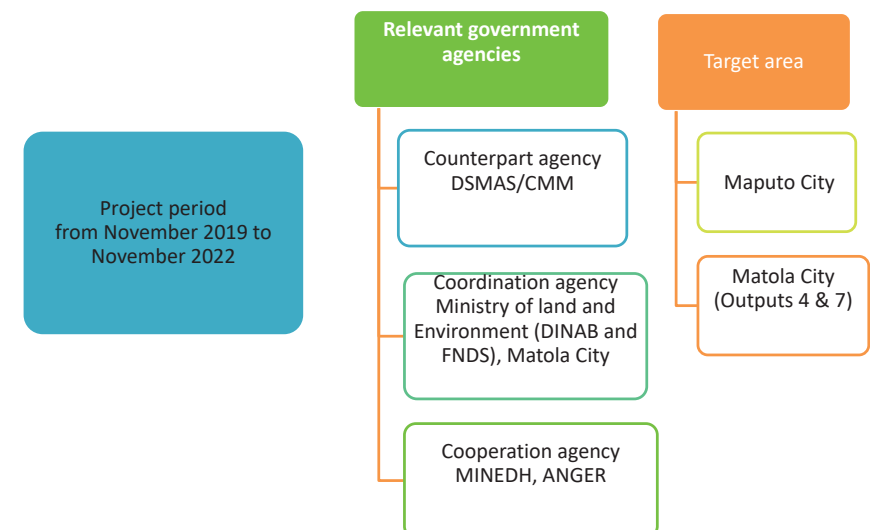
### Project Purpose

“Capacity for implementing ISWM is enhanced based on the M/P, and the capacity development experience is summarized under the name of “Maputo Model”

## Project Context



## Project outline



# Outputs of the Project

[Project Purpose]

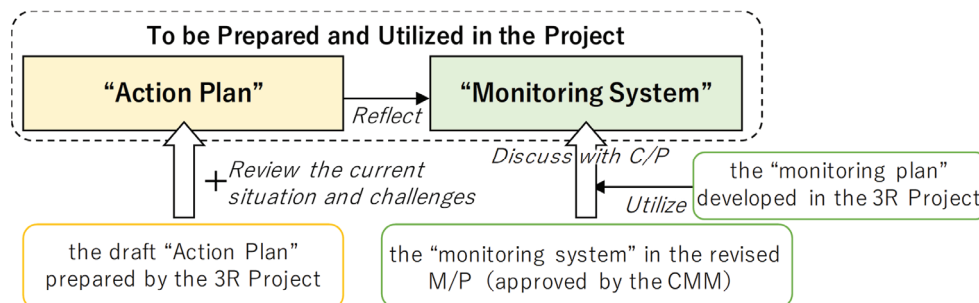
Capacity for implementing ISWM is enhanced based on the M/P, and the capacity development experience is summarized under the name of 'Maputo model'

- **Output 1:** Analyzing current issues & challenges of SWM
- **Output 2:** Waste collection & transportation service
- **Output 3:** Minimizing waste generation and promoting 3Rs
- **Output 4:** Landfill operation and management
- **Output 5:** Financial, organizational and institutional capacity
- **Output 6:** Public awareness and environmental education
- **Output 7:** Compiling 'Maputo model' and its dissemination

# Activities for output 1

- 1.1 Organize seminars and workshops for CMM officer to analyze and evaluate the current situation of SWM
- 1.2 Grasp the current issues on in Maputo City
- 1-3 Review the implementation status of national policies regarding SWM
- 1-4 Identify priority issues in the M/P and prepare the action plan for the M/P
- 1.5 Establish the M/P monitoring system and start the M/P monitoring

## Action plan and monitoring system

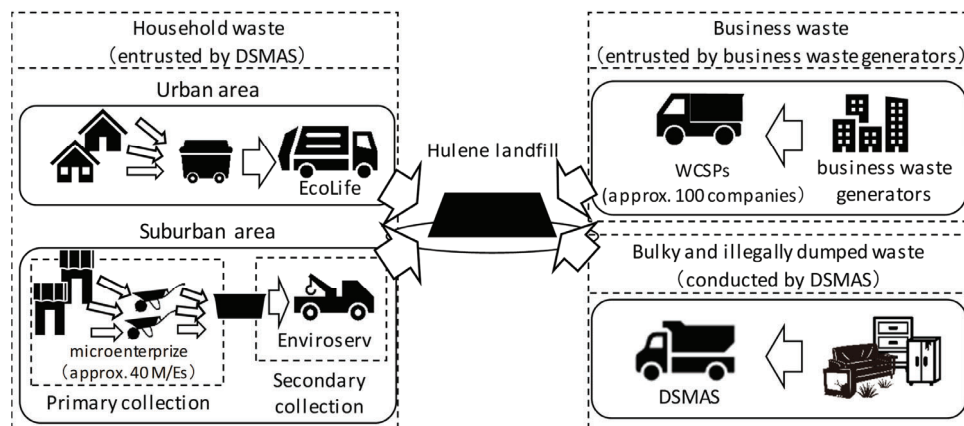


- It is proposed to utilize the draft action plan and the monitoring plan prepared in the 3R project.

## Activities for Output 2

- 2-1 Organize training, seminars, and workshops for CMM officers for supervising the WCSPs
- 2-2 Study the current situation of the WCSPs and their contracts
- 2-3 Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area
- 2-4 Examine revision of the contracts with the WCSPs for improving waste collection service
- 2-5 Study monitoring and control system of waste collection service using ICT

## Category of waste collection service



- It is proposed to examine measures to improve waste collection service for each service category.

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## Activities for Output 3

- 3-1 Formulate a strategy for minimizing waste generation
- 3-2 Plan appropriate source separation method and necessary rules
- 3-3 Plan appropriate segregation method of hazardous waste from MSW
- 3-4 Implement PP on source separation to verify the feasibility of source separation
- 3-5 Organizing training and workshop for supervision, guidance, and enforcement of PP
- 3-6 Promote recyclables market for informal waste collectors
- 3-7 Establish linkage with recycling industries in Mozambique
- 3-8 Study incentive mechanisms to promote recycling

## Proposed source separation method

Target Waste	Recovery Method
<b>Paper</b> (white paper, newspaper, cardboard, etc.)	<ul style="list-style-type: none"> <li>Delivering and selling to the recycling stations (Eco-points) operated by AMOR</li> <li>Delivering to COMSOL's collectors</li> <li>Delivering and selling to other recyclers</li> </ul>
<b>Plastic</b> (PET bottle, high-density plastic, low-density plastic)	
<b>Metal</b> (Aluminum, Steel, etc.)	
<b>Glass</b> (Not broken beer bottle)	
<b>Hazardous waste</b> (used cell battery, fluorescent lamps)	<ul style="list-style-type: none"> <li>Delivering to the Eco-points</li> <li>Handover to DSMAS (to be examined)</li> </ul>

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## Activities for Output 4

- 4-1 Prepare a guideline on landfill operational management including SOP that can be utilized in the new sanitary landfill in Mathlemele.
  - Waste reception management
  - Facility management
  - Landfilling work
  - Environmental management
  - Post landfilling management
- 4-2 Conduct training courses for workers on landfill operational management

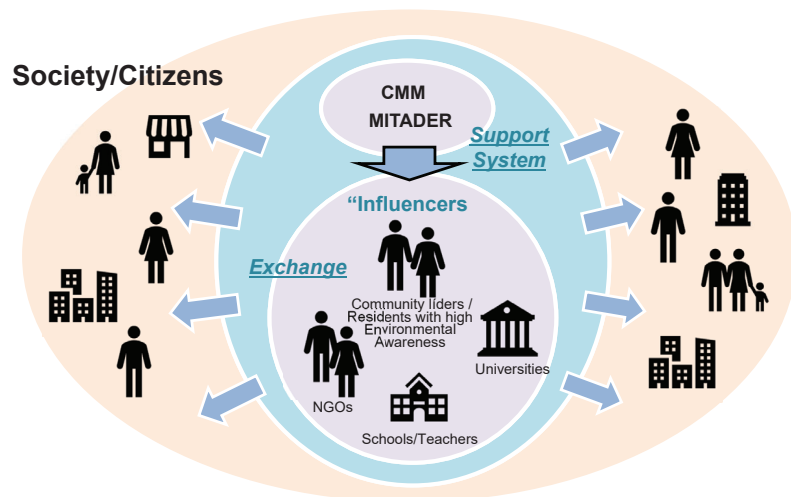
## Activities for Output 5

- 5-1 Review, analyze and evaluate present financial management of SWM by CMM
- 5-2 Propose a financial plan for ensuring cost recovery of SWM by CMM
- 5-3 Review, analyze and evaluate present organization and institution for SWM in CMM
- 5-4 Propose a updating plan of the ordinances and other regulations of CMM related to SWM
- 5-5 Propose an organizational and human resource development plan for CMM/DSMAS

### Social Impact ( = Citizen Mentality and Behaviour Change) :

Develop a network with active actors and build a system to support citizens as “influencers”.

**Sustainability:** establish a sustainable system to involve various stakeholders, such as: citizens, community organizations, NGOs, business entities, schools, universities, etc. in the SWM.



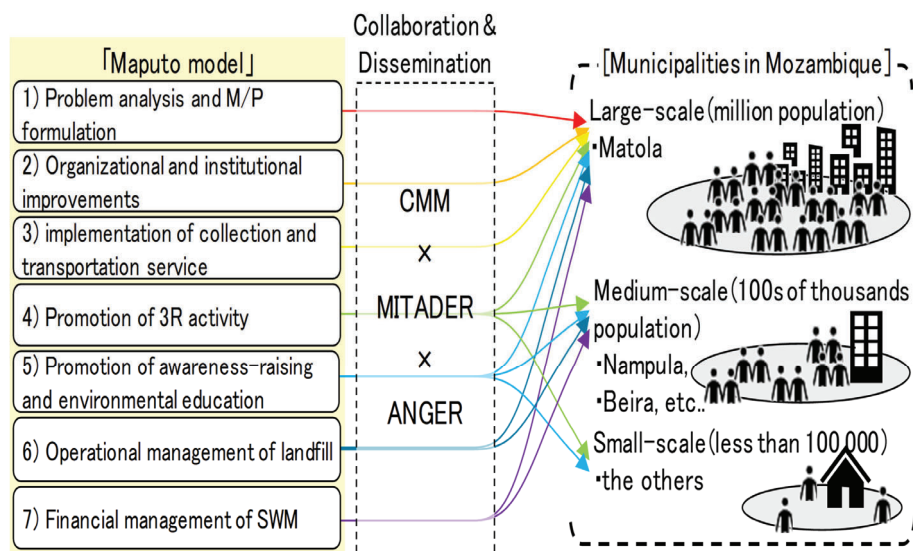
## Activities for Output 6

- 6-1 Organize group work on Public Awareness and Environmental Education along with the Ministre of Land and Environment and MINEDH.
- 6-2 Review the current situation of Public Awareness and Environmental Education In Maputo City and Mozambique.
- 6-3 Prepare Programs and action plans of on Public Awareness and Environmental Education based on the results of the revision.
- 6-4 Produce on Public Awareness material nd Environmental Education material.
- 6-5 Undertake public awareness activities that contribute to the dissemination of 3R concept through collaboration with students, citizens and local community.
- 6-6 Promote environmental education including solid waste topics at Maputo schools.

## Activity for Output 7

- 7-1 Summarize the experience on realizing ISWM in Maputo city as 'Maputo model'
- 7-2 Prepare a dissemination plan of 'Maputo model' to the central/local governments in coordination with MITADER including data collection of targeted cities
- 7-3 Start pilot dissemination with Matola City to identify necessary consideration in disseminating 'Maputo model' to other cities
- 7-4 Organize a national seminar on ISWM in cooperation with ANGER and the relevant organizations

# Compilation and Dissemination of 'Maputo Model'



## Abbreviations

- **MD**- Master Plan
- **DSMAS**- Municipal Directorate of Environment and Solid Waste Management
- **ANGER**- National Association of Solid Waste Managers
- **SOP** – Standard Operational Procedure/Plan
- **CP**- Counterpart
- **PP**- Pilot Project

Thank you Very Much



# JICA's Approach of Capacity Development on Solid Waste Management in Africa

JICA Expert Team  
31st January 2020

## African Clean Cities Platform : ACCP

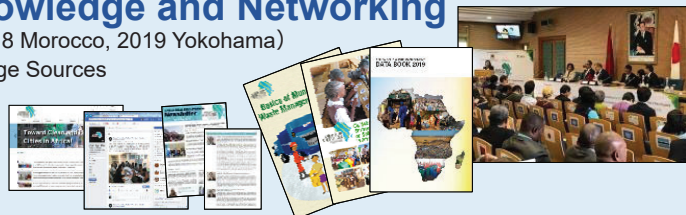
ACCP is a platform to share knowledge and promote the SDGs on waste management in Africa with the aim of African countries realizing clean and healthy cities. It was established in Maputo, Mozambique in April 2017 with the initiatives of the Ministry of the Environment of Japan, JICA, UNEP and UN-Habitat and City of Yokohama.



## Objectives and Activities of ACCP

### Sharing of Knowledge and Networking

- General Meetings (2018 Morocco, 2019 Yokohama)
- Elaboration of Knowledge Sources



### Promotion of SDGs targets on Waste Management

- Training program in Japan / Study tour in African countries
- Pilot Study for SDGs Monitoring



### Promotion of investment in Waste Management

- Promoting participation of donor countries and international organizations
- Discovering Japanese cooperation projects
- Provision of information and opportunities to the private sector



## Elaboration of functional Knowledge Sources



Facebook  
Website

<https://www.facebook.com/ACCP2017/>  
<http://AfricanCleanCities.org/>

# SWM Capacities at Different Levels



## Institutional and Societal level

Laws, Regulations, Standards, Guidelines, Politics, Economy, Education, Social system, Social norms, Public awareness, Infrastructure, Market mechanism, etc.



## Organizational level

SWM Organizations, management, Leadership, Financial ability, Intellectual asset, Physical asset, Technologies, Public relations, Human resource, etc.



## Individual level

Individual ability, Competency, Knowledge, Sense of responsibility, etc.

JICA Institute for International Cooperation (2005), Supporting Capacity Development in Solid Waste Management in Developing Countries - Towards Improving Solid Waste Management Capacity of Entire Society. (JICA, 2004), pp. 155-162. [http://open\\_jicareport.jica.go.jp/pdf/11795846.pdf](http://open_jicareport.jica.go.jp/pdf/11795846.pdf)

Waste Generation  
Discharge

Waste Collection  
Transport

Intermediate  
Treatment

Final Disposal

## Required Capacities



**Individual level:** Residents' awareness on waste issue



**Organizational/Institutional level:** Rules and norms about waste discharging (to be formulated and enacted by Government and Municipality)



**Societal level:** Community awareness on waste issue and education, Compliance and participation/cooperation in communities

Output 2 (collection & transportation)  
Output 6 (environmental education)

Waste Generation  
Discharge

Waste Collection  
Transport

Intermediate  
Treatment

Final Disposal



### Problems frequently observed in Africa

- Generation of large amounts of waste
- Disordered waste discharge and dumping
- Scattering of waste in and around residential areas
- Hazardous waste mixed in with other wastes without separation

Output 2 (collection & transportation) &  
Output 6 (environmental education)



Waste Generation  
Discharge

Waste Collection  
Transport

Intermediate  
Treatment

Final Disposal



### Problems frequently observed in Africa

- Generation of uncollected waste
- Variation in collection rates between areas and districts
- Deterioration of public health and loss of amenities
- Increasing cost of transport

Output 2 (collection & transportation)







## Required Capacities

Output 2 (collection & transportation)



**Individual level:** Technical competency of waste collection and transport workers



**Organizational level:** Operation and management system for waste collection and transport

**Institutional level:** Rules and norms about waste collection and transport (to be formulated and enacted by Municipality)



**Societal level:** Infrastructure for waste transportation



## Required Capacities

Output 3 (recycling)



**Individual level:** Technical competency of intermediate treatment workers/engineers



**Organizational level:** Planning and setup of treatment facilities and its operation and maintenance

**Institutional level:** Rules and norms about waste treatment (to be formulated and enacted by Municipality)



**Societal level:** Collaboration with private recycling industries (PPP:Public private partnership)



## Problems frequently observed in Africa

- Low recycling rates
- Generation of items that are difficult to treat
- Increasing cost of facility construction and operation/ maintenance

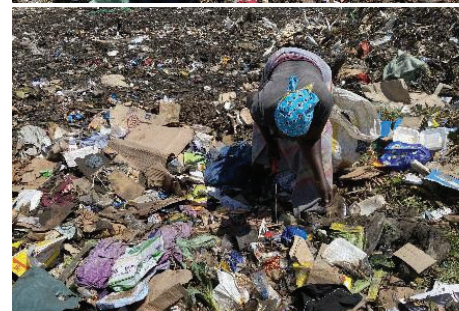
Output 3 (recycling)



## Problems frequently observed in Africa

- Environmental pollution caused by open dumping (water contamination, foul odors, etc.)
- Collapse of waste mound and fire outbreak
- Generation of greenhouse gases
- Outflow of disposed waste and spread of marine pollution by plastic wastes
- Insufficient land and difficulty of consensus building on siting for landfills

Output 4 (landfill operation & management)







## Required Capacities

Output 4 (landfill operation & management)



**Individual level:** Technical competency of final disposal site workers/engineers



**Organizational level:** Planning of sanitary landfill and its construction, operation and maintenance

**Institutional level:** Rules and norms about final disposal (to be formulated and enacted by Municipality)



**Societal level:** Collaboration with informal waste pickers at dumpsites, Consensus building with local community



## Required Capacities for All Stages

Output 1 (M/P monitoring)

Output 5 (finance, organization & institution)

Output 6 (environmental education)



**Organizational level:** Institutional structure of waste management organizations, intellectual assets (analysis of current situation, monitoring, data, plans, etc.), physical assets (facilities, machinery, materials, etc.), financing/financial capacity, public awareness and public relations capacity, human resource development



**Institutional level:** Laws, standards, and municipal ordinances about waste management, fee collection, regulatory system for extended producer responsibility (EPR), system for enforcement / operation of related laws and regulations



**Societal level:** Social norms and basic legislation about environmental conservation, environmental education, media communication

## JICA's Technical Cooperation Projects on SWM in Africa

**Morocco, 2018–Suspended**  
The Project for Elaboration of the National Strategy for Treatment of Household and Similar Waste

**Nigeria, 2015–2018**  
The Project for Integrated Solid Waste Management System in Federal Capital Territory

**Kenya, 2012–2016**  
Capacity Development of Solid Waste Management of Nairobi City



**Sudan, 2014–2017**  
The Project for Strengthening Solid Waste Management in Khartoum State of Sudan

**South Sudan, 2017–2018**  
Data Collection Survey on Solid Waste Management in Juba

**Mozambique, 2013–2017, The Project for Promotion of Sustainable 3R Activities in Maputo**  
**2019–2022, The Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo**



Output 7 (Maputo Model)

## Clean-up Campaign “SPO GOMI” in Maputo



# Clean-up Campaign “SPO GOMI” in Maputo

- **Date:** March 13, 2020 (Fri)
- **Venue:** Costa do Sol

- **Assumed Participants:**

MITA, MINEDH, departments in CMM, Matola city, NGOs, municipal districts, local community organization, private companies, nearby schools, universities, JICA office and volunteers, etc.

- **Program (tentative):**

Time	Agenda
8:30-9:00	Registration
9:00-9:40	Opening ceremony
9:40-10:40	Competition (Picking up garbage)
10:40-11:00	Measuring weights and ranking
11:00-11:30	Closing ceremony

*Please join us creating a team of 3 to 5 people with colleagues of your institution!!*



# Proposal on revision of Project Design Matrix (PDM) and Plan of Operation (PO)

JICA Project Team  
31st January 2020

## PDM & PO

- **Project Design Matrix (PDM)**
  - A table summarizing activities, inputs, outputs, objectives, and other components of a project, together with their logical interrelationships.
- **Plan of Operation (PO)**
  - A planning chart showing implementation timing & duration for each activity on PDM.

## Structure of PDM

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
<b>Overall Goal</b> What will be aimed at after the project purpose is achieved?	Standard for measuring project achievement	Data sources from which indicators are derived.	Conditions important for the project.
<b>Project Purpose</b> What should the project achieve within the project duration.			
<b>Outputs</b> How should the project achieve the Purpose.			
<b>Activities</b> What should be done concretely to achieve the Outputs?	<b>Inputs</b> Purpose, materials, equipment, facilities, and funds required by the project.		<b>Pre-conditions</b>

3

## Structure of PDM

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
<b>Overall Goal</b> What will be aimed at after the project purpose is achieved?	Standard for measuring project achievement	Data sources from which indicators are derived.	Conditions important for the project.
<b>Project Purpose</b> What should the project achieve within the project duration.			
<b>Outputs</b> How should the project achieve the Purpose.			
<b>Activities</b> What should be done concretely to achieve the Outputs?	<b>Inputs</b> Purpose, materials, equipment, facilities, and funds required by the project.		<b>Pre-conditions</b>

4

## Necessity of revising PDM & PO

- PDM & PO (version 0) is attached in the Record of Discussions (R/D) for the Project.
  - Indicators & Means of Verification in the PDM were not fully determined.
  - PO for outputs was prepared but the schedule for each activity were not determined.
  - Restructuring of CMM (DMSC→DSMAS), unification of terminology, etc.
- It is necessary to revise PDM & PO (as version 1) in accordance with the Inception Report (ICR) prepared by the project team.

5

## Overall goal

Integrated solid waste management (ISWM) is established in a sustainable manner in Maputo City and the 'Maputo model' is disseminated to other cities.

### Indicators

1. MSW collection rate increases from \*\*% to \*\*%. (SDG 11.6.1)
2. MSW recycling rate increases from \*\*% to \*\*%. (SDG 12.5.1)
3. The concept of the 'Maputo model' is disseminated inside/ outside Mozambique.

6

## Project Purpose

The capacity for implementing ISWM is enhanced based on the SWM Master Plan (M/P) of Maputo City, and the capacity development experience is summarized under the name of the 'Maputo model'.

### Indicators

1. The progress rate of the SWM M/P implementation increase from \*\*% at the beginning to \*\*% at the end.
2. MSW collection service coverage is improved from \*\*% at the beginning to \*\*% at the end (SDG 11.6.1)
3. MSW recycling amount increase from \*\* ton at the beginning to \*\* ton at the end (SDG 12.5.1)

7

## Project Purpose (cont.)

### Indicators

4. The average score of the capacity assessment at the organizational level shows an improvement from \*\* at the beginning to \*\* at the end.
5. The average score of the capacity assessment at the individual level shows an improvement from \*\* at the beginning to \*\* at the end.
6. The citizen's satisfaction and cooperation on SWM in Maputo City shows an improvement from \*\* at the beginning to \*\* at the end.
7. Draft regulation on source separation and the updating plan of ordinances and regulations on SWM is approved by CMM.

8

## Output 1 (M/P monitoring)

The capacity for analyzing current issues and challenges of SWM in Maputo City is enhanced.

### Indicators

1. Action Plan for the M/P is prepared.
2. Monitoring System for the M/P is established.
3. Periodical monitoring on the revised M/P is implemented.

9

## Output 2 (collection & transportation)

The capacity for supervising the waste collection and transportation service is enhanced.

### Indicators

1. The draft plan to optimize waste collection & transportation service in Maputo City is prepared.
2. Revision of contracts with the WCSPs is proposed in accordance with the draft plan.

10

## Output 3 (recycling)

The capacity for minimizing waste generation and promoting 5Rs (Rethink, Refuse, Reduce, Reuse, Recycle) are strengthened.

### Indicators

1. The amount of recyclables recovery increased by XX% through the source separation PP.
2. Draft regulation on source separation is prepared.
3. The recycling forum is organized biannually.

11

## Output 4 (landfill operation & management)

The technical capacity for operation and management of final disposal is enhanced.

### Indicators

1. The guideline on sanitary landfill operation and management is prepared.
2. XX staff participates in the training on sanitary landfill operation and management.

12

## Output 5 (finance, organization & institution)

The financial, organizational, and institutional capacities in SWM are enhanced.

### Indicators

1. The financial plan for cost recovery on SWM is proposed.
2. The updating plan of ordinances and regulations on SWM is proposed.
3. The plan for organizational and human resource development in DSMAS is proposed.

13

## Output 6 (environmental education)

The capacity for raising public awareness on the environment including waste issues and environmental education at various levels are strengthened.

### Indicators

1. The percentage of children/households who understand and act on 5Rs concept and garbage disposal rules increase by XX% through PPs for awareness-raising and environmental education.
2. Awareness-raising and environmental education activities are conducted XX times.

14

## Output 7 (Maputo Model)

The experience of realizing ISWM in Maputo city is summarized as the 'Maputo model' and disseminated to other cities.

### Indicators

1. The 'Maputo model' is compiled.
2. A dissemination plan of the 'Maputo model' is prepared.
3. A national seminar on the 'Maputo model' is organized.

15

## Way forward

- PDM & PO (version 1) will be discussed and finalized at this 1<sup>st</sup> JCC.
- PDM & PO will be further discussed and revised at upcoming JCCs, as necessary.
  - Target figures in the Indicators will be examined by the project team, by further analyzing current situation and conditions.

16



Thank you





# Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo

## “Current Situation of Solid Waste Management in Maputo City”

Maputo, 31<sup>st</sup> of January 2020

1/30/2020

Eng Teresa CHISSEQUERE

1

## 1. Maputo Characteristics



**Location:** Western Margin of Maputo bay, in the southmost tip of the country near the border with South Africa and Swazilandia. Therefore, in the threefold boarder of the three countries;

**Area:** approximately, 300 Km<sup>2</sup>, and a population of around 1.101.170 (2017 Census-preliminary results). Its metropolitan area includes the municipality of Matola, and the Districts of Boane and Marracuene, with a total population of approximately 3.158.465 inhabitants;

**Administrative division:** The City is divided into 7 Districts and 63 (bairros) Neighborhoods with well defined boundaries;

**Urban area:** Expands from South to the North including the Airport;

**Suburban area:** Has a very low residential level and infrastructure.

1/30/2020

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3

## CONTENT OF THE PRESENTATION

### CONTENT

1	Characteristics of Maputo
2	Legal Framework
3	Current Solid Waste Management
4	Solid Waste Final Disposal
5	Safety Conditions Improvement in the Hulene Dumpsite
6	USWM Master Plan Review
7	USWM Challenges

1/30/2020

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2

## 2. Legal Framework

- Country Constitution 2004
- Land Law
- Environmental Law
- City Cleaning Ordinance
- Regulations on Private Sector Participation in USWM (Micro Enterprises Introduction);
- Regulations on Activities supervision of USWM;
- 2018 Master Plan Reviewed;
- Regulations on Solid Waste Management;

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4

### 3. Current USWM

City Council of Land Use, Environment and Urbanization in charge of environment and solid waste activities and support to Municipal Districts (DM) Sweeps.

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5

### 3. Current USWM

- Collection, Transport and Deposit of SWM;
- Municipal Management of the dump site;
- Environmental and Health Education
- Urban Resiliency
- Park and workshop management for vehicles fleet maintenance for Urban Solid Waste Collection.

1/30/2020

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6

### 3. Current USWM

#### 1. Urban area (Secondary collection )

- High Density area: has a private operator collecting waste using 1,1L and 6m3 containers;
- Current Coverage: Around 100%;
- Collection: Around 120 and 150 tons/day;
- Residential area: collection door to door;

#### 1.1 Suburban area (Secondary collection);

- Medium density area has private provider for USW collection in the suburban area, through 12m3 containers;
- Collection of around 170 Containers/day;
- Current Coverage: Around 100%;
- Collection of around 650 tons/day;

#### 1.2 Suburban area (Primary collection)

- Use of Txova to allow collection in areas of difficult accessibility by large vehicles.
- Current Coverage: Around 100%;
- Financed by CMM Cleaning Tax;
- Result: Significant improvement in the cleanliness of suburban neighbourhoods;

1/30/2020

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7

### 4. Solid Waste Final Deposition



Although the Hulene dump site capacity was estimated to exceed in 2014, the dump site is still open and operational to this day;

The current location of urban solid waste deposition in Maputo Municipality is located in a residential area of hulene which in turn presents negative impacts to public health and environment of near by areas;

In 2018 there was waste collapse;

The dump site receives approximately 1200 tons/day of USW including glass bottles, plastic, paper, organic material, and other.

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8

## 5. Safety conditions improvement in the Hulene dump site

- Implementation of safety conditions improvement project in the Hulene dump site;
- Aims to implement the Fukuoka method, which consists of soil stabilization, and minimization of odors and Methane gas.

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9

## 6. Review of USWM Master Plan

- The Master plan aiming to continue the 3R activities was approved;
- Reduction of solid waste production in the source;
- and differentiated collection;
- These activities will be introduced and tested through pilot projects in area of mayor production of urban solid waste;
- Similarly to what happened in Chamanculo “D” and Zimpeto neighborhoods

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10

## 7. USWM Challenges

- Ensure the financial sustainability of SWM
- Ensure the existence of a minimum fleet for USW collection, in the scope of contracts and sovereign organs
- Include waste collectors in an orderly manner, specially those from Hulene dump site;
- Lack of compliance of deposition timetable of USW by citizens
- Expand the Fukuoka method, in the dump site in general
- Raise public awareness on good environmental practices
- Revision of ordinances on USW management;
- KaTembe - waste treatment is the biggest challenge in the district, in what concerns final disposal. Consequently there is an increase in waste production due to increase in population density;
- which means that operational costs will increase, which in turn will pose challenges in getting funds to face this new reality;

1/30/2020

Eng Teresa CHISSEQUERE

11

Thank You Very Much

ARIGATO

KANIMAMBO

NDA MBONGA

*Unidos e coessos, vamos txunar Maputo (United we clean Maputo)*

1/30/2020

Eng Teresa CHISSEQUERE

12



### AGENDA of the 2nd Joint Coordination Committee Meeting

- Date: 19 November 2020 (Thursday)
- Time: 8:30 to 12:00
- Venue: JICAMozambique Office, DSMAS Office (Web-based)
- Agenda:

Time	Agenda	Presenter/in-charge
8:00-8:30	<i>Registration/Preparation</i>	DSMAS/JET
8:30-8:40 (10 min)	Introduction of participants	Mr. Sergio, Head of Department, DSMAS
8:40-8:45 (5 min)	Opening remarks by CMM	Mr. Silva Magaia Vereador of CMM
8:45-8:50 (5 min)	Opening remarks by JICA	Ms. Nishinoiri, Deputy chief representative of JICA Mozambique office
8:50-9:00 (10 min)	Overall activities and modification of project schedule due to COVID-19 pandemic	Mr. Hosono, Chief adviser of JET
9:00-9:20 (20 min)	Progress of Output 1 activities	Mr. Soeda, Deputy chief adviser of JET
9:20-9:40 (20 min)	Progress of Output 2 activities	Mr. Otsuka, Expert of JET
9:40-10:00 (20 min)	Progress of Output 3 activities	Mr. Hosono, Chief adviser of JET
10:00-10:15	<i>Break</i>	
10:15-10:25 (10 min)	Progress of Output 4 activities	Mr. Hosono, Chief adviser of JET
10:25-10:45 (20 min)	Progress of Output 5 activities	Ms. Grace Expert of JET
10:55-11:15 (20 min)	Progress of Output 6 activities and activities to tackle COVID-19	Ms. Kojima Long term expert of JET
10:45-10:55 (10 min)	Progress of Output 7 activities	Mr. Hosono, Chief adviser of JET
11:15-11:45 (30 min)	Overall discussion	All/ Mr. Domingos, Director of DSMAS
11:45-12:00 (10 min)	Closing remarks by CMM	Mr. Silva Magaia Vereador of CMM

- End of document -

## Progress of the Project Activities

- Overall –  
Modification of project activity and schedule  
due to COVID-19 pandemic

JICA Project Team  
November 2020

### [Activity 0-1] Capacity assessment, Revision of PDM & PO

- Initial (baseline) capacity assessment was conducted in December 2019.
  - End-line capacity assessment will be conducted 6 months before completion of the Project, to evaluate results of capacity development by the Project.
- PDM & PO (Ver.1) were prepared by the Project team and approved in the 1<sup>st</sup> JCC in January 2020.
  - PDM & PO will be further revised at future JCC meetings as needed.

2

### [Activity 0-3] Counterparts' training in abroad

- Originally, C/Ps' training in Japan was scheduled in June 2020, and another training in Brazil was planned in 2021.
  - It was inevitable to postpone C/Ps' training in Japan to August 2021 (tentative) due to COVID-19 pandemic,
  - and it is necessary to combine the 2 trainings into 1 training program in Japan.
- On the other hand, JICA and Ministry of Environment, Japan are currently providing the online training courses on SWM to DSMAS and other Mozambican counterparts.

4

### [Activity 0-2] Preparation of ICR, Holding JCC meetings

- Project's Inception Report (ICR) was prepared and finalized in January 2020.
  - The contents of ICR was explained and discussed in the 1<sup>st</sup> JCC.
- Project's kick-off meeting was held in November 2019.
- 1<sup>st</sup> JCC meeting was held in January 2020.
  - Originally, JCC were scheduled every 6 months.
  - 2<sup>nd</sup> JCC could finally be held in November 2020 due to COVID-19 pandemic.
  - It is proposed to hold 3<sup>rd</sup> JCC in May 2021, to discuss contents of Project's Progress Report (PR).

3

## [Activity 0-4] Project's dissemination activities

- Dissemination of the project activities has been actively implemented in the course of the project operation:
  - SWM seminar was held on 18<sup>th</sup> December 2019.
  - Project's brief note (1) was issued in April 2020.



5

## [Activity 0-5] Project's progress monitoring, Preparation of PR

- 1<sup>st</sup> Project Monitoring Sheet (PMS) was prepared in July 2020.
  - Project's progress monitoring will be conducted every 6 months,
  - and 2<sup>nd</sup> PMS will be prepared in December 2020.
- Project's Progress Report (PR) will be prepared in April 2021 by summarizing progress of the 1<sup>st</sup> half of the project and the activity plan for the 2<sup>nd</sup> half.
  - Contents of PR will be explained and discussed in the 3<sup>rd</sup> JCC scheduled in May 2021.

6

Thank you

7



## Progress of the Project Activities

### - Output 1 –

### The capacity enhancement for analyzing current issues and challenges of SWM in Maputo City

JICA Project Team  
November 2020

[Activity 1-1] Organize seminars and workshops for CMM officers to analyze and evaluate the current situation of SWM.

- Solid Waste Management Seminar was organized by CMM on December 18<sup>th</sup>, 2019 as a part of Project activities.
- Not only the municipal staff from CMM including Mayor and Councilor, but also others from MITA, ANAMM, Private recycling enterprises, NGOs and Mozambican researchers participated in the seminar to make very enthusiastic discussions.
- JET introduced the Project outline, while DSMAS reported the progress of the urgent rehabilitation works at Hulene dump site.

2

[Activity 1-2] Grasp the current issues on SWM in Maputo city.

- Since the Project started, JET has been grasping the current SWM situations and its issues, together with DSMAS and other organizations:
  1. Waste Collection and Transportation
  2. Final Disposal at Hulene Dump site
  3. Progress of New Landfill at Mathlemele
  4. Financial Data Collection and Analysis
  5. 5R activities and concerned bodies like NGOs
  6. Civic Education Activity
- Even under restricted circumstances due to the epidemic of COVID-19, field survey has been conducting remotely with DSMAS and JET Mozambican staffs.

3

[Activity 1-3] Review the implementation status of national policies regarding SWM.

- Through the discussion with MITA, the current status of implementing the concerned national policies has been confirmed.
- In addition, JET has asked MITA to provide the current status of SWM in other municipalities in Mozambique.

4

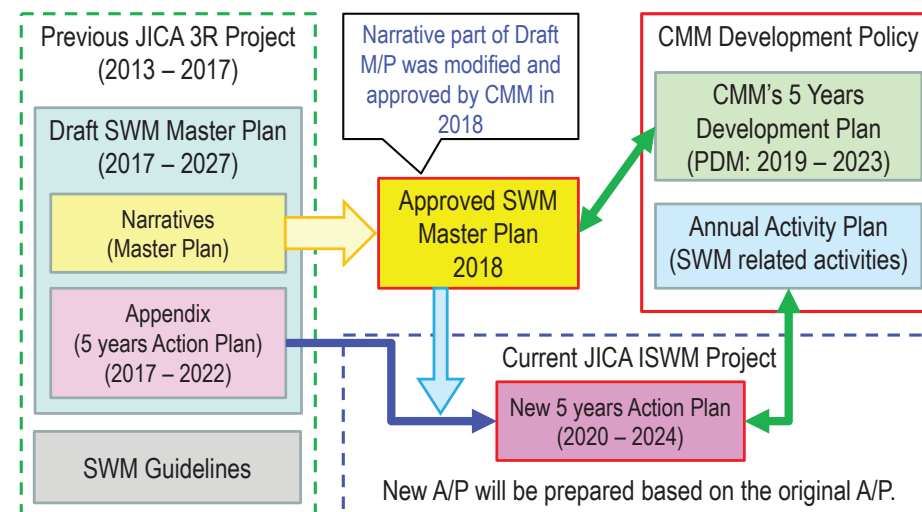


## [Activity 1-4] Identify priority issues in the M/P and prepare the action plan for the M/P.

- JET has reviewed and compared the following documents to know the consistency of the contents of the approved M/P and Action Plan.
  - Respective Plan at Chapter 6 of the approved M/P
  - “Table 6.24: Implementation Schedule of the Activities” in Chapter 6 of the approved M/P
  - Action Plan which was originally prepared during the previous JICA 3R project
  - CMM’s activity plan 2019 and 2020, especially related part of solid waste management, together with CMM’s 5 years development plan (PDM: 2019 – 2023).

5

## [Activity 1-4] Identify priority issues in the M/P and prepare the action plan for the M/P.



6

## [Activity 1-4] Identify priority issues in the M/P and prepare the action plan for the M/P.

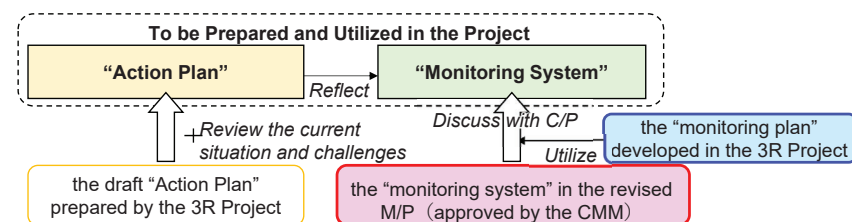
### Contents of A/P with major revised points

No.	Category	Major Revised Points
AP1	Overall of Master Plan	Mid-term review of M/P in 2021
AP2	Review of Organizational Structure of DSMAS	Review of new organizational structure of DSMAS for further improvement, if necessary
AP3	Waste Collection and Transportation	Study for waste transportation to Katembe landfill if constructed
AP4	Waste Treatment and Disposal	Tentatively, it is assumed that new landfill will start its operation in 2024
AP5	5R Promotion	Reconsider to promote home composting
AP6	Civic Education	It shall be restructured by current situations
AP7	Financial Management	Maintain the original actions proposed

- Target years of A/P is from 2020 to 2024
- Responsible department and section are updated under DSMAS

7

## [Activity 1-5] Establish the M/P monitoring system and start the M/P monitoring.



- JET is now reviewing and comparing “6.2 Indicator Matrix and Monitoring System 2017 – 2027” in the approved M/P and “Chapter 7” in the revised M/P drafted during the previous JICA 3R but deleted in the approved M/P, checking the consistency with the description of respective plan proposed in the approved M/P.
- After above-mentioned comparison, JET will make tentative modifications on the current monitoring system in the approved M/P for the discussions DSMAS.

8

Thank you

## Progress of the Project Activities

- Output 2 –  
The capacity for supervising the waste collection and transportation service is enhanced.

JICA Project Team  
November 2020

**[Activity 2-2]** Study the current situation of the WCSPs and their contracts.

The following 6 issues were identified by the survey on the current situation.

### [Issue]

1. Container management
2. Waste amount management
3. Waste flow management
4. ME collection service management
5. WCSP tender & contract TOR
6. Inspection management

**[Activity 2-1]** Organize training, seminars, and workshops for CMM officers for supervising the waste collection service providers (WCSP).

On-the-job training workshops are being conducted for C/Ps



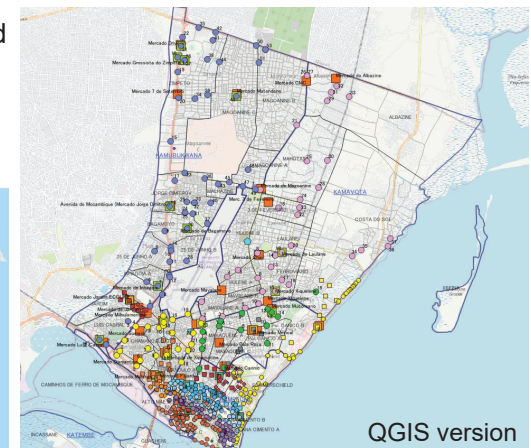
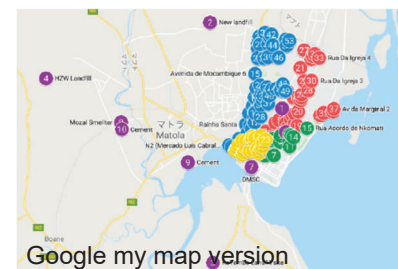
2

**[Activity 2-2]**

### Issue 1. Container management:

- The number of containers and their location was unknown. Monitoring was not working well.

- The container map was created by Google My Maps and QGIS Maps utilizing photo data



## Issue 2. Waste amount management

- Lack of knowledge about analysis and utilization of weighbridge data.
- Since Dec-2019, weighbridge at Hulene dumping site has been broken.

## Issue 3. Waste flow management

- Proper management of business waste is not adequately controlled. It might be mixed in household waste.
- The waste amount in each district is unclear, because some WCSPs provide services in same areas.

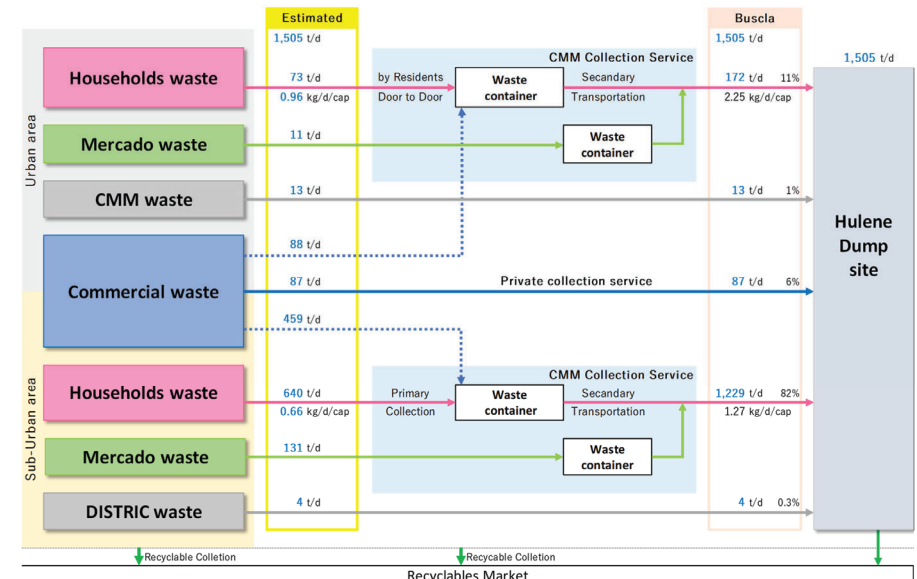
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## Issue 4. ME collection management

- The status of the collection service of ME (collection route, usage of containers, etc.) are not fully understood.
  - The survey of ME collection service was postponed due to COVID-19.
  - But the survey will start with possible contents of survey.

7

- Waste flow were created based on Bascula data & the container MAP.



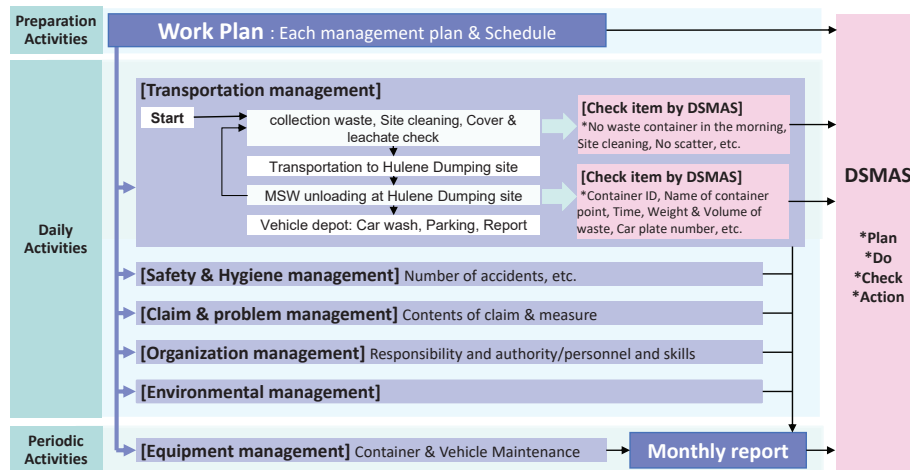
When will the weighbridge restart? The weighbridge functioning is key for contract management and the tipping fee.

## Issue 5. TOR of tender & contract for WCSP

- The document format & contents (Work Plan, monthly report, etc.) required to be submitted to WCSP is not specified.
- DSMAS monitoring items are not sufficiently clarified.
- Bidding and contracting procedures require coordination with CMM, and delays in WCSP procurement operations are common.

8

## [Activity 2-4] Examine revision of the contracts with the WCSPs for improving waste collection service.



- Categorizing the work content
- Management plan for each category
- Performance indicator for each management plan
- monitoring & evaluation with PDCA cycle

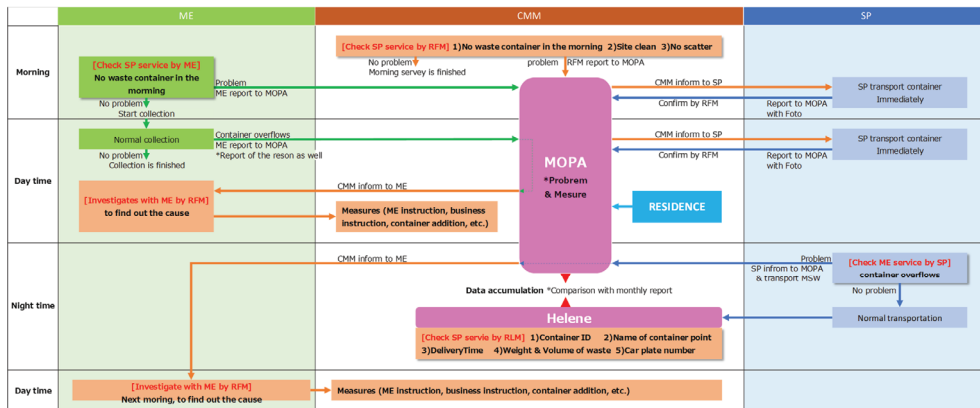
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## Issue 6. Inspection management

- The inspection & monitoring items by the RFM are unclear, the monitoring data is not accumulated, and the related departments are not linked.
- Currently the MOPA system is not working. MOPA system requires a contract with the provider.
- Insufficient coordination with District & Bairro Office.

10

## [Activity 2-5] Study monitoring and control system of waste collection service using ICT (Information and Communication Technology).



- Currently, monitoring and control system by utilize MOPA is discussed.

11

## [Activity 2-3] Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area

- Activity2-3 will be implemented after the examination of the contract management & the monitoring method for new SP collection services are finished.
- The examination of necessity of Transfer Station to the new landfill site was started.
- It is also necessary to consider the use of the Katembe landfill site, where the study has started.

12

Thank you



## Progress of the Project Activities

### - Output 3 – Minimizing waste generation and promoting 5Rs

JICA Project Team  
November 2020

#### [Activity 3-1] Formulate a strategy for minimizing waste generation

- Approved M/P sets the basic approaches to promote 5R:
  1. Establishing an institutional framework to promote 5R activities;
  2. Promoting awareness-raising activity on 5R for all waste generators;
  3. Promoting 5R activities in the urban area, in collaboration with recycling-related actors,
  4. Promoting 5R activities in the suburban area, by DSMAS's initiative.
- They can be regarded as strategy for minimizing waste generation.

2

#### [Activity 3-2] Plan appropriate source separation method and necessary rules

- Based on the experiences in 3R Project and following the approved M/P, the target items are set:
  1. Paper (white paper, newspaper, cardboard, etc.)
  2. Plastic (PET bottle, HDPE, PP, etc.)
  3. Metal (Aluminum, Steel, etc.)
  4. Glass (Not broken glass bottle)
- Inclusion of "Glass" will be further examined considering its recycling market price.
- Necessary rules on source separation will be examined after implementation of PP.

3

#### [Activity 3-2] Plan appropriate source separation method and necessary rules

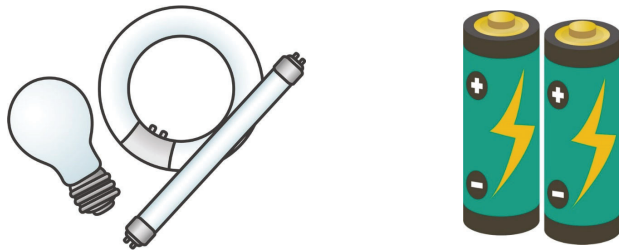
- Examples of source separation practice in 3R Project



4

### [Activity 3-3] Plan appropriate segregation method of hazardous waste from MSW

- It is aimed to **examine feasibility on source separation of households' hazardous waste** such as florescent lamps/tubes and cell batteries.
- So far, a hazardous waste landfill in Mavoco operated by Enviroserv was identified.



5

### [Activity 3-3] Plan appropriate segregation method of hazardous waste from MSW

- **Mavoco Hazardous Waste Landfill**
- Location: Beleluane, Boane, Maputo Province
- Operator: Enviroserv
- Operation started from 2005
- Capacity: 20 ha, 78,000 m<sup>3</sup> (Need for expansion)
- The landfill receives industrial hazardous waste, and **it can accept fluorescent tubes and cell batteries.**



6

### [Activity 3-4] Implement PP on source separation to verify the feasibility of source separation

#### Source Separation PP at CMM offices

- **Objective:**  
Verifying feasibility of source separation at CMM offices aiming at expanding to other offices and households in Maputo City in future
- **Location:**
  - CMM Head Office (2 stations)
  - DSMAS (1 station)
  - DMU/DAS, DPJ, DMOTC (3 stations)
  - District Offices of Kampfumo, Kamavota, Kalhamankulo, Kamaxaquene, Kamubucuana (5 stations)

7

### [Activity 3-4] Implement PP on source separation to verify the feasibility of source separation

- **Target items:**
  - Paper (office paper excluding confidential documents)
  - Plastic (Plastic bag, PET bottle, HDPE, PP)
  - Metal (Beverage can)
  - Glass (Not broken beverage bottle)
  - Hazardous waste (Fluorescent lamp/tube, cell battery)
- **Potential partners:**
  - **Recyclers:** Fapacar (paper), Valor Plastico (plastic), TOPACK (plastic, metal), 3R (metal, glass) Repensar (glass)
  - **Collector:** **Not identified yet**
    - DSMAS may consider providing collection & transportation service by itself. 1-2 times per month collection will be enough.

8



### [Activity 3-4] Implement PP on source separation to verify the feasibility of source separation

Recycler	Paper	Plastic	Metal	Glass
COMSOL	X	X		X
Pagalata	X			X
Recic-Moz		X	X	
RLR	X	X	X	X
Reciclagem e Serviços		X		
Nhassengo Comercial			X	
Oliveiras Multi-Service			X	
RECONICE			X	
Repensar				X
Replasa, Lda		X		
TOPACK		X	X	
Lisorte		X		

9

### [Activity 3-5] Organizing training & workshop for supervision, guidance and enforcement of PP

- On-the-job training for C/Ps will be organized at each stage of PP: planning, preparation, implementation, monitoring & evaluation.
- Currently, workshops on planning of PP and interviews to existing recycling-related actors are being conducted.



10

### [Activity 3-6] Promote a market of recyclables for informal waste pickers

*(This activity will be implemented in the latter stage of the project.)*

- CMM/DSMAS's fundamental policy is to engage informal waste pickers in formal activities.
- Measures to promote formalization of waste pickers will be examined.
  - Engaging informal waste pickers in the formal recycling activities by recycling NGOs.
  - Employing informal waste pickers as workers at a material recovery facility (MRF) to be installed next to Mathlemele sanitary landfill.

11

### [Activity 3-7] Networking among recycling industries in Mozambique

- It is aimed to establish a platform of recycling-related actors for sharing information and discussing measures to promote recycling in cooperation with the DSMAS.
- Interview surveys to existing recycling-related actors are being conducted, aiming to understand their activities and to examine methodology of their networking.
- However, the survey is currently suspended due to the COVID-19 pandemic.

12

## [Activity 3-8] Study incentive mechanism for promoting recycling

*(This activity will be implemented in the latter stage of the project.)*

- Based on results of Output 3 activities, a mechanism to further promote recycling activities in Maputo City will be examined, which will include:
    - **Regulatory measures:**  
application of the regulations concerning source separation to be drafted in [Activity 3-2]
    - **Economic measures:**  
provision of incentives such as reduction, exemption and subsidy of cleaning tax
    - **Awareness-raising measures:**  
(to be examined under Output 6)
- 

Thank you

## Progress of the Project Activities

### - Output 4 – Landfill operation and management

JICA Project Team  
November 2020

#### [Activity 4-1] Prepare a guideline on landfill operational management

- It is aimed to prepare a practical guideline on sanitary landfill operation & management referring to international standards as well as MICOA's guideline (2010).
- Draft table of contents of the guideline:
  - Chap 1: Introduction
  - Chap 2: Waste reception management
  - Chap 3: Facility management
  - Chap 4: Landfilling management
  - Chap 5: Environmental management
  - Chap 6: Post-landfilling management
- Flowcharts & formats will be included so as to be utilized as standard operating procedures (SOP).

2

#### [Activity 4-2] Conduct training courses for workers on landfill operational management

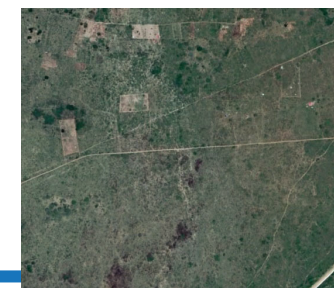
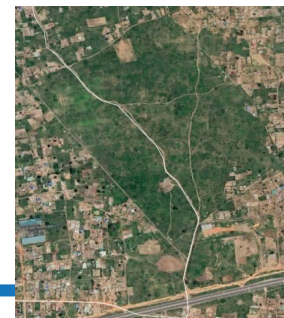
*(This activity will be implemented in the latter stage of the project.)*

- Lectures & on-site training based on prepared “guideline on landfill operational management” will be conducted.
- Originally, it is planned to conduct on-site training at Mathlemele landfill, but its construction work is in delay.
- Method and arrangement of training course will be further examined considering progress of Mathlemele and Katembe landfill projects.

3

Currently, the project team is following up the relevant landfill projects as a preliminary activity.

- Need to obtain technical reports of Mathlemele landfill such as the facility development plan, the operation & management plan.
- CMM intends to promote the 2 landfill projects.  
**Examination on operational plans of 2 landfills will be necessary.**



4

Thank you

# Progress of the Project Activities

## Output 5 Financial, Organizational and Institutional Capacity

JICA Project Team  
November 2020

## [Activity 5-1] Review, analyze and evaluate present financial management of SWM

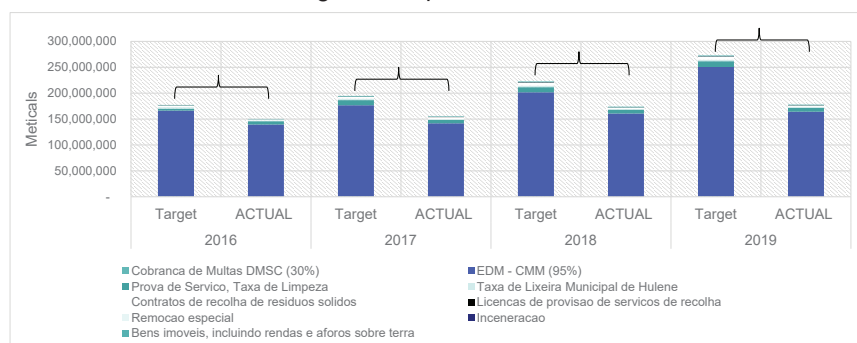
- Activities conducted
  - Understanding of the present financial operations structure of the sector
    - Key people/officers
    - Changes in the structure and personnel composition
  - Review of M/P
    - Budget planning?
    - Strategies implemented?
    - Challenges addressed?



2

## [Activity 5-1] Review, analyze and evaluate present financial management of SWM

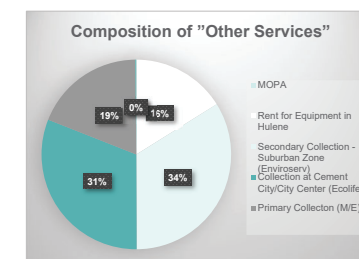
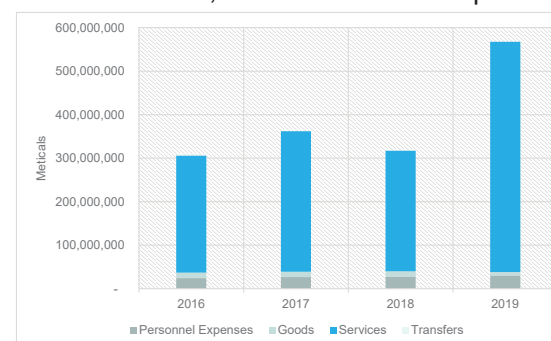
- Own-Generated Revenue
  - Total revenues increased by an annual average of 21% (4-yr)
  - But fell short of target by 23%
  - EDM-collected cleaning fee comprised 92%



3

## [Activity 5-1] Review, analyze and evaluate present financial management of SWM

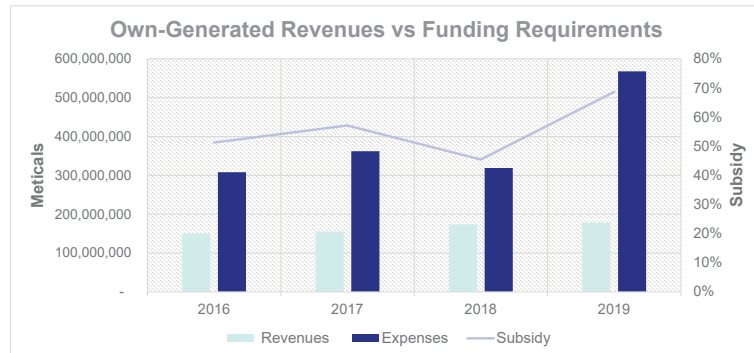
- Expenses
  - Challenging data collection: 2018-2019 remain to be preliminary
  - “Other Services” → primarily contracts, comprised almost ALL of Services, and 76% of Total Expenditures



4

## [Activity 5-1] Review, analyze and evaluate present financial management of SWM

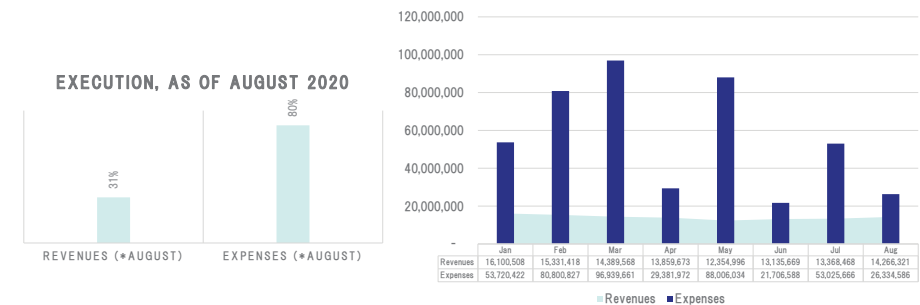
- Funding SWM
  - Own-generated revenues only covered 44% of total expenditures
  - CMM subsidized the sector by 56%



5

## [Activity 5-1] Review, analyze and evaluate present financial management of SWM

- As of August 2020, own-generated revenue at 31% of target.
- Expenses, at 80% of budget
  - “Other Services” already at 105%
  - Capital investments at 132%
  - 0% execution in some expense items observed



6

## [Activity 5-2] Propose a financial plan for ensuring cost recovery

- Challenges on Optimizing Revenues
  - SWM Fee --- responsiveness to actual cost of SWM, justification as to economic status of payor (proxy: electricity consumption), and connection to waste generation
  - Cleaning Fee paid for by businesses --- how to tap the market for optimized service provision and actual cost of transport and collection → Effectively remove burden of revenue collection by PdS



7

## [Activity 5-2] Propose a financial plan for ensuring cost recovery

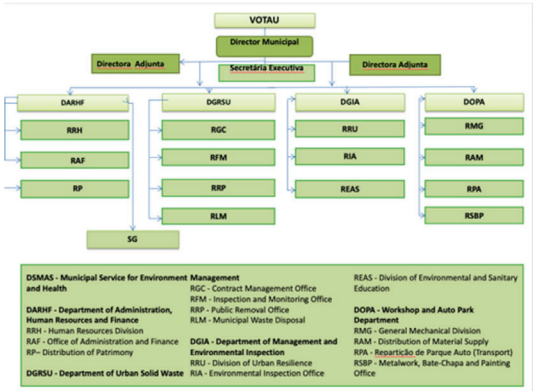
- Need to emphasize on certain principles for efficient use of resources: cost-correcting measures
  - Budget planning and operations
  - Integrity of data – e.g., Proof of Service database
  - Transparency
    - How are contract costs calculated?
    - revenue collection services (EDM)
    - Hulene tipping fee?
  - Accountability/ownership to official tasks and deliverables
  - Less volatility in assignments/designation of DSMAS staff

8



[Activity 5-3] Review, analyze and evaluate present organization and institution for SWM

- Collection of ALL pertinent regulations, ordinances, laws on SWM from national to City-specific
- Review is a continuing activity
- DSMAS organizational structure has ‘radically’ changed over time, and continues to change



9

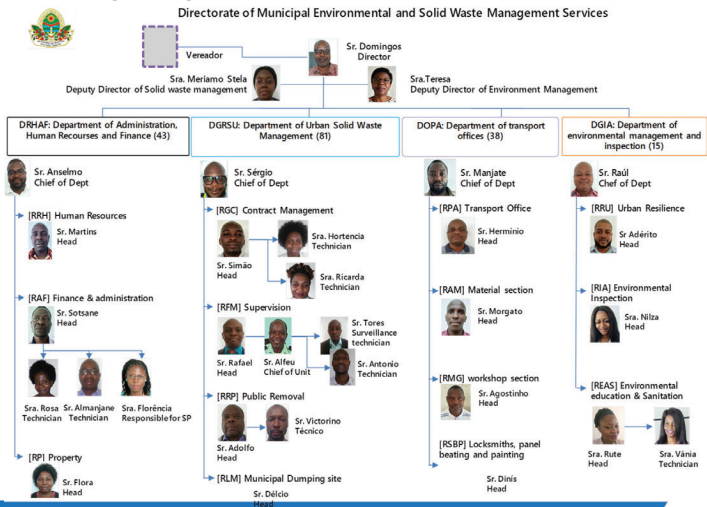
[Activity 5-3] Review, analyze & evaluate present organization & institution for SWM

- DSMAS consists of the departments responsible for SWM under former DMSC and the environmental management under former Directorate for Urban Planning.
- The organizational reform of CMM was approved in Feb 2019 and DSMAS started its operation from August 2019.
- It is regarded that CMM partially realized the proposed measure on organizational improvement set out in the approved M/P.

10

[Activity 5-3] Review, analyze & evaluate present organization & institution for SWM

- DSMAS organogram & heads of department/section.



11

[Activity 5-3] Review, analyze & evaluate present organization & institution for SWM

- List of national laws/regulations on SWM

Title	Ref. No.	Year
Constitution of the Republic		2004/2018
Legal Framework for the Implementation of Local Municipalities	2	1997
Legal regime of administrative tutelage of the State that is subject to local autarchies	7	1997
Legal-juridical regime for the finances and municipalities' assets	11	1997
Environmental Law	20	1997

12

### [Activity 5-3] Review, analyze & evaluate present organization & institution for SWM

- List of national laws/regulations on SWM

Title	Ref. No.	Year
Regulation on Biomedical Waste Management	8	2003
Regulation on Environmental Inspection	11	2006
Regulation on Waste Management	13	2006
Regulation on Management and Control of Plastic Bag	16	2015
Regulation on Environmental Quality Standards and Effluent Emission	18	2004

13

### [Activity 5-3] Review, analyze & evaluate present organization & institution for SWM

- List of national laws/regulations on SWM

Title	Ref. No.	Year
Regulation for the Prevention of Pollution and Protection of Marine and Coastal Environment	45	2006
Regulation on Travel Agencies and Tourism by Information Professionals	54	2015
Regulation on Extended Responsibility of Producers and Importers of Packaging	79	2017
Regulation on Hazardous Waste Management	83	2014
Regulation on Urban Solid Waste Management	94	2014

14

### [Activity 5-3] Review, analyze & evaluate present organization & institution for SWM

- List of CMM ordinances/rules on SWM

Title	Ref. No.	Year
Articles in Force on the Municipal Cleaning Ordinance	15	2004
Urban Solid Waste Cleaning Ordinance in Maputo Municipality	86	2008
Regulation on the Supervision of Cleaning Activities in Maputo Municipality	87	2008
Regulation on the Private Sector Participation in the Cleaning of Maputo Municipality	88	2008
Regulation on the Cleaning Components of Maputo Municipality	89	2008

15

### [Activity 5-4] Propose a plan updating ordinances of CMM related to SWM

*(This activity will be implemented in the latter stage of the project.)*

- Based on results of [Activity 5-3], an institutional framework necessary to realize the M/P will be examined:
  - Incentive granting measures for promotion of recycling (related to [Activity 3-8])
  - Cost recovery measures such as revision of cleaning tax (related to [Activity 5-2])
- Policy gaps with the current ordinances & rules of CMM will be sort out and, [a plan updating ordinances/rules related to MSWM in Maputo City](#) will be prepared.
  - Note: The Project will not draft ordinance/rule itself.

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## [Activity 5-5] Propose an organizational & human resource development plan for DSMAS

*(This activity will be implemented in the latter stage of the project.)*

- Based on results of [Activity 5-3], the "organizational development plan" in the approved M/P will be updated.
  - Identified discussion points so far:
    - Reinforcement of Proof of Service Section.
    - Function & Role of Supervision Section.
    - Section in charge of 5Rs promotion.
- Besides, a "human resource development plan" will be prepared to enhance capacity of DSMAS staff by means of OFF-JT and OJT.

Thank you

## - Output 6 – Public awareness and environmental education

### What is SPO GOMI?

SPO GOMI is a new style of clean-up campaign that incorporates the elements of sports and is promoted in Japan.



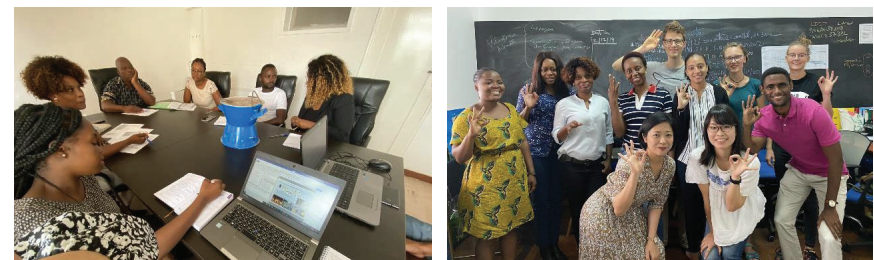
Categoria e Pontos		
Latas		100 g = 50 pontos
Plástico e garrafas PET		100 g = 40 pontos
Garrafas de vidro		100 g = 20 pontos
Beata de cigarro e bateria		100 g = 100 pontos
Outros resíduos		100 g = 5 pontos

[Activity 6-1] Organize a working group on public awareness and environmental education with MITA and MINEDH.

- A core working group on public awareness and environmental education was organized within DSMAS.
- Meetings with MITA and MINEDH were held and commitments of cooperation have been confirmed. A working group with them will be set up at an appropriate time.
- A clean-up campaign (SPO GOMI) was planned and prepared as a project launch event, but it was suspended due to the COVID-19 pandemic. It will take place after the Japanese experts return to Mozambique.

[Activity 6-2] Review the current status of public awareness activities and environmental education

- Interview surveys have been conducted with relevant stakeholders in PA and EE, including national and local governments, NGOs, private companies, to review the current status and consider the way to collaborate.
- However, the survey has been suspended due to the COVID-19 pandemic.



[Activity 6-3] Prepare a program and action plan for public awareness and environmental education based on the review results

- The basic direction of programs for public awareness and environmental education was discussed and agreed upon by core working group members.
- Due to the COVID-19 pandemic, awareness-raising activities on infection prevention measures are currently being prioritized over the usual activities and the preparation of programs and action plans is suspended.

5

[Activity 6-4] Produce public awareness and environmental education materials

[Activity 6-5] Conduct public awareness-raising activities that contribute to the spread of the 5R concept

- In conjunction with the PP on source separation (activity 3-4), prepare the necessary materials and conduct awareness-raising activities.
- **Targets** : CMM and district office staff
- **Methods**
  - Provide trainings to all staff
  - Assign a person in charge of source separation to each section
  - Introduce a system to monitor whether recyclables is properly sorted and feedback the results to staff
  - Disseminate the CMM's initiatives to the public

6

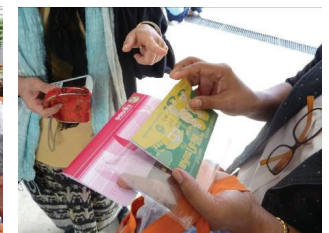
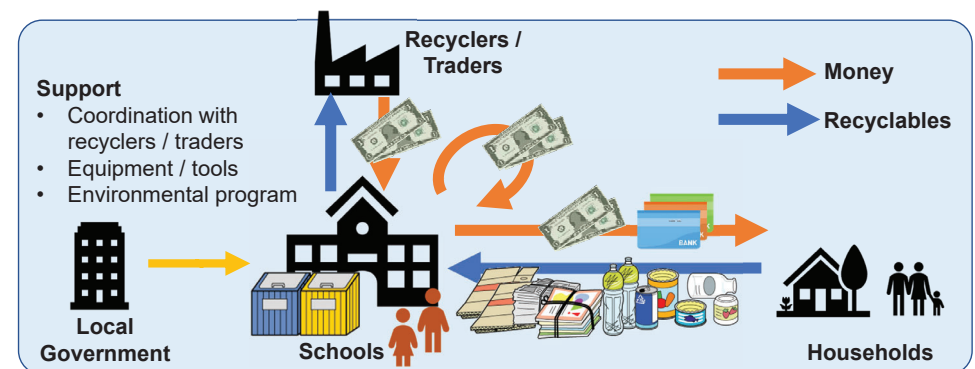
[Activity 6-6] Promote environmental education including the waste issue in schools in Maputo

- Utilizing the existing initiatives of the Eco-Schools Program implemented by CMM and some NGOs in elementary and secondary schools, enhance 5R-related programs, such as "SPO GOMI" and school-based recyclables collection.

*This activity will be implemented after the COVID-19 pandemic has stabilized.*

7

## School Based Recyclables Collection



## - Additional Activity – COVID-19 Measures

### 1) Infection prevention measures for community

- JET supported DSMAS to create flyers for citizens on how to dispose of infectious waste such as used masks, gloves and tissues with saliva and runny nose.
- DSMAS conducted trainings for community leaders using flyers.



## Objectives of additional activities

- To ensure the safety of workers and citizens engaged in waste management under COVID-19 pandemic.
- To take necessary measures to continue the waste collection and treatment operation to sustain public health even under the further spread of COVID-19.
- To strengthen the capacity of DSMAS to respond to emergency conditions such as the spread of infectious diseases.
- To share experiences and lessons learned in responding to the COVID-19 pandemic to other member cities and countries of the African Clean Cities Platform

### 2) Infection prevention measures for DSMAS staff

Targets: DSMAS staff 183 persons

- Training materials and posters on COVID-19 measures for office workers were prepared.
- Masks, face shields, hand sanitizers, equipment sanitizers, hand soap, medical thermometers were procured for DSMAS staff.
- DSMAS has been conducting trainings for all DSMAS staff.

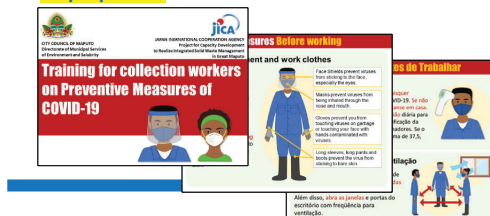




### 3) Infection prevention measures for collection workers of microenterprises

Targets: 46 microenterprises, 934 collection workers

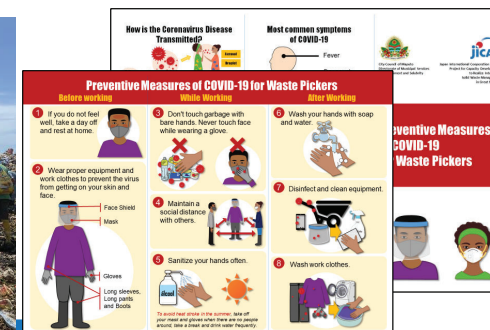
- A telephone survey was conducted with 15 MEs to find out their issues and needs.
- Training materials on COVID-19 measures for collection workers were prepared.
- Masks, face shields, gloves, hand sanitizers, equipment sanitizers, hand soap, medical thermometers were procured for MEs.
- DSMAS will conduct trainings and distribute equipment to MEs.



### 4) Infection prevention measures for waste pickers (WPs) in Hulene dumpsite

Targets: about 800 waste pickers

- Flyers on COVID-19 measures for WPs were prepared.
- Masks, face shields, gloves, hand sanitizers, hand soap were procured for WPs.
- DSMAS will distribute flyers and equipment to WPs.



### 5) Supervise and instruct large-scale collection service providers

- DSMAS and JET interview large-scale collection service providers (CSPs) about the impact of COVID-19 on collection service and their measures to address it.
- Based on the interview results, DSMAS will provide necessary instructions to CSPs, in cooperation with JET.

### 6) Measures for waste generated in hospitals

- DSMAS and JET interview the Directorate for Health of CMM and the Ministry of Health to confirm the management of infectious waste in hospitals and consider measures to be taken if necessary.
  - Public hospitals and clinics : there are 5 incinerators for infectious waste in Maputo, and all infectious waste generated in public hospitals and clinics have been segregated at source and burned in the incinerators.
  - Private hospitals and clinics : It will be confirmed by a meeting with the MOH in charge of private hospitals and clinic.

## Progress of the Project Activities

### - Output 7 – 'Maputo Model' Compilation

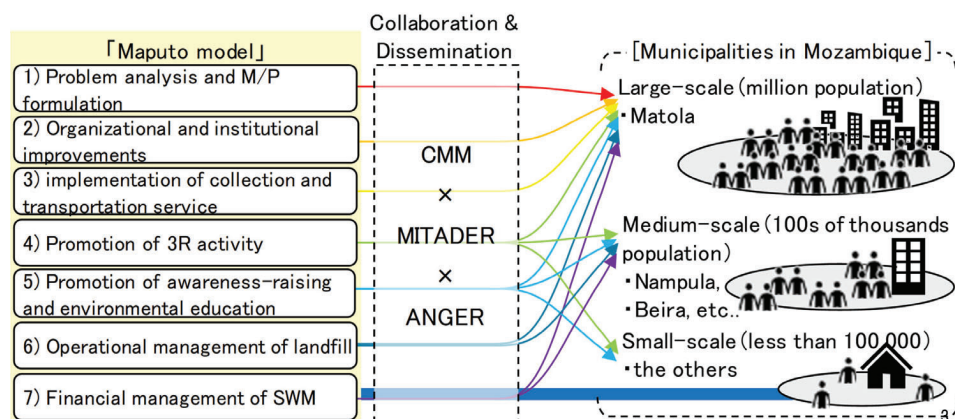
JICA Project Team  
November 2020

#### [Activity 7-1] Summarize experience on realizing ISWM in Maputo city as 'Maputo model'

- Lessons learnt from the Project and other experiences of DSMAS on realizing ISWM in Maputo city will be summarized as 'Maputo model'.
- The project team is communicating with MITA, Matola City, ANAMM for the planned collaborated activities.

#### [Activity 7-2] Prepare a dissemination plan of 'Maputo model' to other cities in Mozambique

- Dissemination plan of 'Maputo Model' will be prepared in collaboration with MITA, Matola City, ANAMM/ANGER.
  - Currently, the project team is requesting MITA to provide "urban solid Waste data collection sheets".



#### [Activity 7-3] Start pilot dissemination of 'Maputo model' with Matola City

*(This activity will be implemented in the latter stage of the project.)*

- Some activities from 'Maputo model' will be selected, and pilot dissemination activities will be conducted by Matola City with support from DSMAS.
  - Matola City is willing to start dissemination activity as soon as possible.
    - Awareness-raising activity
    - 5R promotion activity
- JET will provide technical support for preparation & implementation of pilot dissemination activities.
- Lessons learnt from the pilot dissemination activities will be reflected in the "Maputo model" dissemination plan.

## [Activity 7-4] Organize a national seminar on ISWM in cooperation with MITA & ANAMM

*(This activity will be implemented in the latter stage of the project.)*

- Holding a national seminar at the end of the Project by CMM/DSMAS's initiative with the objectives of:
  - To disseminate results of the project activities and introduce 'Maputo model'.
  - To discuss how to promote nationwide ISWM in Mozambique using "Maputo model".
- Mozambican side will need to bear cost of the seminar and expenses of participants from local governments.
  - It is proposed to combine with ANAMM's annual gathering and/or adopt a webinar format so that ISWM seminar can be organized in sustainable manner.

Thank you





### AGENDA of the 3rd Joint Coordination Committee Meeting

- Date: 4 June 2021 (Friday)
- Time: 9:00 to 12:00
- Venue: DSMAS Office Meeting Room (connected to Zoom)
- Agenda:

Time	Agenda	Presenter/in-charge
8:30-9:00	<i>Registration/Preparation</i>	DSMAS/JET
9:00-9:10 (10 min)	Introduction of participants	Mr. Martins, Chief of Section, DSMAS
9:10-9:15 (5 min)	Opening remarks by CMM	Mr. Silva Magaia, Councilor, CMM
9:15-9:20 (5 min)	Opening remarks by JICA	Ms. Shimodaira Director, Global Environment Dept., JICA
9:20-9:35 (15 min)	Progress of Output 1 activities	Ms. Stela, Deputy Director, DSMAS
9:35-9:50 (15 min)	Progress of Output 2 activities	Mr. Sergio, Head of Department, DSMAS
9:50-10:05 (15 min)	Progress of Output 3 activities	Ms. Vania, Technician, DSMAS
10:05-10:20 (15 min)	Progress of Output 5 activities	Mr. Anselmo, Head of Department, DSMAS
10:20-10:35 (15 min)	Progress of Output 6 and COVID-19 prevention activities	Mr. Raul, Deputy Director, DSMAS
10:35-11:00	<i>Break</i>	
11:00-11:25 (25 min)	Major achievement in the first half of the project and the way forward	Mr. Hosono, Chief adviser, JET
11:25-11:30 (5 min)	Status of Japanese and other donor's support related to the project and importance of their collaboration	Dr. Kojima, Long term expert, JET
11:30-11:55 (25 min)	Overall discussion	All/ Mr. Domingos, Director, DSMAS
11:55-12:00 (5 min)	Closing remarks by CMM	Mr. Silva Magaia, Councilor, CMM

- End of document -

## Progress of the Project Activities

### - Progress of General and Output 1 activities -

JICA Project Team - DMAS  
June 2021

## [General Project Activities] PR Preparation and Holding of the JCC meeting

- The project Progress Report was prepared in April, 2021.
- The contents of the PR will be explained and discussed at this meeting;
- Counterpart's training during the project period
  - C/P training in Japan planned for late 2021 due to the COVID-19 pandemic situation; however JICA provided online trainings to DMAS;
  - It is proposed to hold the 4th JCC in November 2021, to discuss revision of PDM indicators and confirm progress of project activities.

2

## Output 1: Master Plan implementation

- Action Plan of the Master Plan was developed.
  - The Action Plan will be verified and updated as necessary during M/P monitoring.
- Monitoring System (M/S) to monitor progress of M/P implementation was developed.
  - DSMAS needs to start M/P monitoring based on the developed M/S.
  - Further discussion on the indicators & targets of M/S will be conducted.

3

## Action Plan 2020 (1)

No	Actions taken during 2020 to 2024	
AP1. Overall of Master Plan		
AP1-1	Monitoring of the Progress of the approved M/P 2018	JICA Pjt
AP1-2	Monitoring of the Progress of the A/P (2020 to 2024)	JICA Pjt
AP1-3	Implementation of the Mid-Term Review for the approved M/P 2018	DSMAS
AP1-4	Implementation of Waste Quantity and Quality Survey	DSMAS
AP1-5	Minor Updating the approved M/P 2018 (Updated M/P 2023)	DSMAS
AP1-6	Amendment of Cleansing Ordinance	DSMAS
AP2. Review of Organizational Structure of DSMAS		
AP2-1	Establishment of DSMAS	DSMAS
AP2-2	Review of the new organizational structure under DSMAS	JICA Pjt
AP2-3	Capacity Development of DSMAS Staff	DSMAS
AP2-4	Consideration of Inter-Municipal Association for Landfill Operation	DSMAS
AP3: Waste Collection and Transportation		
AP3-1	Consideration of Increase of Transportation Distance to the New Landfill for Urban Collection	JICA Pjt
AP3-2	Expansion of Door to Door Urban Collection	DSMAS
AP3-3	Consideration of Increase of Transportation Distance to the New Landfill in Mathlemele and/or Katembe for Secondary Collection from Sub-Urban Area	JICA Pjt
AP3-4	Waste Transportation from Katembe	DSMAS
AP3-5	Primary Collection in Katembe	DSMAS
AP3-6	Removal of Illegal Dumping Waste	DSMAS
AP3-7	Improvement of Special Collection by DSMAS	DSMAS

4

## Action Plan 2020 (2)

No	Actions taken during 2020 to 2024	
AP4: Waste Treatment and Disposal		
AP4-1	Construction and Operation of the New Sanitary Landfill in Mathlemele	FNDS
AP4-2	Construction and Operation of the New Sanitary Landfill in Katembe	WB
AP4-3	Closure of Hulene Dumping Site	WB
AP4-4	Introduction of Intermediate Treatment System	DSMAS
5R Promotion		
AP5-1	Upgrade 5R Policy Framework	JICA Pjt
AP5-2	3R Promotion in Urban Area, including recyclables recovery from public buildings and spaces	JICA Pjt
AP5-3	Expansion of 5R Station in Sub-Urban Area (if this action can be applicable)	WB?
AP5-4	Introduction of Segregated Waste Collection in Sub-Urban Area (if this action can be applicable)	DSMAS
AP5-5	Promotion of Household Composting (if this action can be applicable)	DSMAS
AP6: Civic Education		
AP6-1	Introduction of 5R Principles in Teaching Institutions	JICA Pjt
AP6-2	Public Sensitization Campaigns in Critical Places	JICA Pjt
AP7: Financial Management		
AP7-1	Estimation of Major Expenditure for the New Solid Waste Management System	DSMAS
AP7-2	Improvement of the Revenue Mechanism	JICA Pjt
AP7-3	Study for Change of Cleaning Tax Rate and its Charging System	JICA Pjt

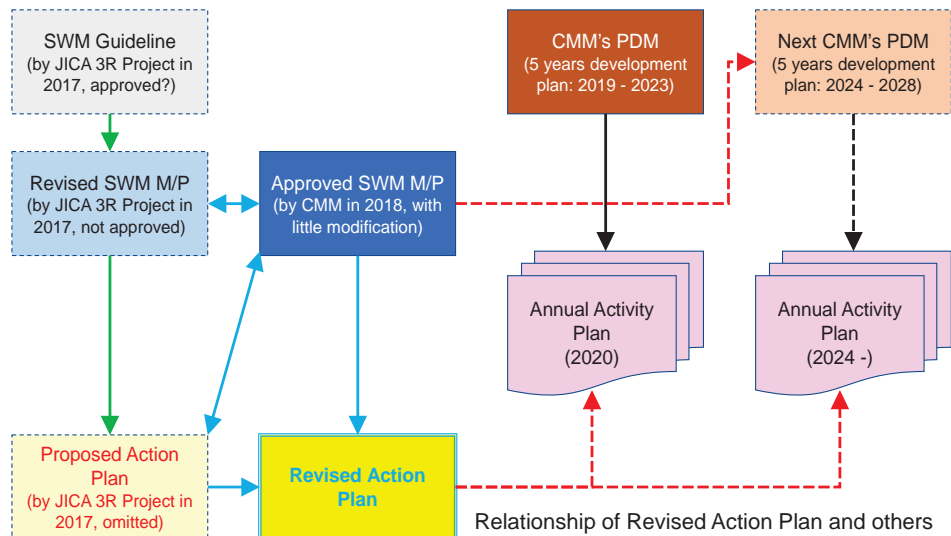
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## Action Plan 2020 (Image)

Monitoring of 2020 Year			Monitoring By (DSMAS, XXXXX, XXXXX, XXXXX, XXXXX, XXXXX)							As of May 2020																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Related Content of Master Plan 2018 approved by CSM	Actions taken during 2020 to 2024	Goal to be Achieved	Responsible Department/Function	Person in Charge	Related Organization	Direct Responsibility	Expenditure Responsibility	2020																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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AP4: Monitoring of the Progress of the approved M/P 2018	(1) Formulation of Monitoring Team	Monitoring Team	DSMAS	Deputy Director of DSM	All Departments	Yes	Not Necessary																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

6

DSMAS's annual activity plan & budget should be consistent with M/P & A/P



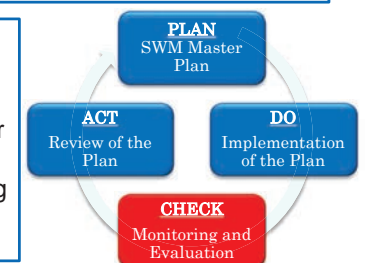
7

M/P monitoring system and start the M/P monitoring

Why and What is “Monitoring System” for Municipal Waste Management Master Plan?

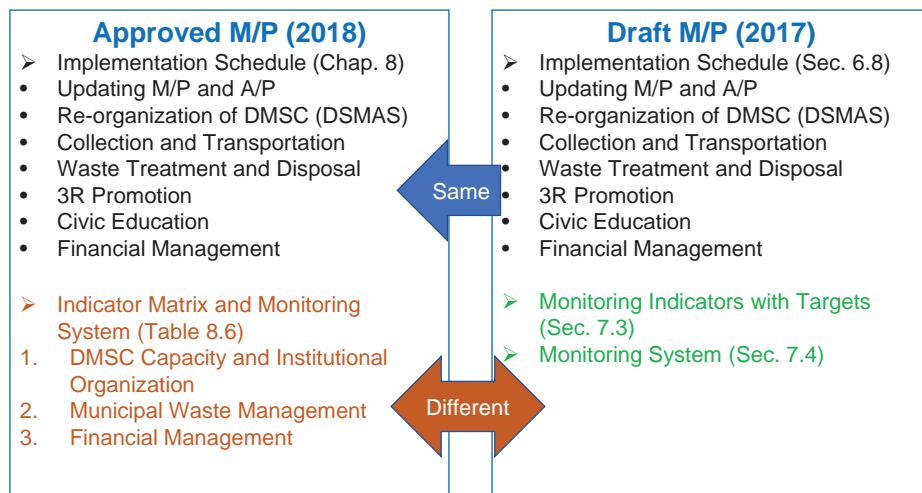
→ See the introduction of Chapter 7 of draft M/P developed in the previous JICA 3R Project.

- ✓ Monitoring of this master plan is to be conducted as “Check” under the concept of **PDCA (Plan, Do, Check and Action) cycle**
- ✓ Monitoring will be done with the **Indicators** for measuring the achievement of implementation of the Master Plan comparing the **targets**.



8

## Comparison of Monitoring Structure of M/P 2018 and draft M/P 2017



9

## Monitoring Indicators for M/P (2)

No	Indicator	Definition and how to measure
<b>3R Promotion</b>		
4.1	Annual Quantity of recyclables collected in urban area (ton/year)	DSMAS obtain data on recyclables recovered by private and non-governmental 3R actors.
4.2	Annual quantity of waste recycled in the suburban area (ton/year)	DSMAS obtain data on recyclables recovered by 5R station and household composting activities
4.3	Workshops with 5R actors	Number of workshops held
<b>Civic Education</b>		
5.1	Introduction of 3R principles in teaching institutions	Percentage of schools per district that received training on 3R principles
5.2	Public sensitization campaigns in critical places	Percentage of neighborhoods per district where sensitization activities are conducted
<b>Financial Management</b>		
6.1	Self-Coverage rate for SWM Cost	Annual financial report
6.2	Target coverage rate for Proof of service revenue	Annual financial report
6.3	Target coverage rate for Cleaning Tax	Stipulations in Municipal By-law

11

## Monitoring Indicators for M/P (1)

No	Indicator	Definition and how to measure
<b>Re-Organization of DSMAS</b>		
1.1	Establishment of DMGRSUS	Approved by CMM
1.2	Reorganization of DAF	Approved in DSMAS
1.3	Continuous Capacity Development	Number of DSMAS Staff who take training
<b>Collection &amp; Transportation</b>		
2.1	Averaged daily quantity of waste collection by service providers in urban area (ton/day)	Record of weighing bridge
2.2	Averaged daily quantity of waste collection by secondary collection in sub-urban area (ton/day)	Record of weighing bridge
2.3	Number of neighborhood of KaTembe with primary collection	Report by micro enterprise
<b>Treatment &amp; Disposal</b>		
3.1	Averaged daily quantity of waste enter the landfill (ton/day)	Record of weighing scale
3.2	Average daily quantity of recyclables collected at MRF (ton/day)	Record of MRF operation
3.3	Averaged daily quantity of waste disposed of at landfill (ton/day)	By Calculation (= Index 3.1 – index 3.2)

10

## Monitoring Indicator for Waste Collection & Transportation

No	Indicator	Definition and how to measure	Target 2018	Target 2019	Target 2020	Target 2021	Target 2022
2.1	Averaged daily quantity of waste collection by service providers in urban area (ton/day)	Record of weighing bridge	114 (182)	115 (185)	116 (188)	117 (191)	117 (195)
2.2	Averaged daily quantity of waste collection by secondary collection in sub-urban area (ton/day)	Record of weighing bridge	464 (700)	467 (721)	469 (742)	472 (764)	475 (786)
Note : Above value is from Approved M/P with the assumption of collection coverage rate is 100% (Below value) is the reference value from Draft M/P prepared at the Previous JICA Project, with the assumption of gradual increase of collection coverage rate.							
2.3	Number of neighborhood of KaTembe with primary collection	Report by micro enterprise	1	3	3	5	5

12

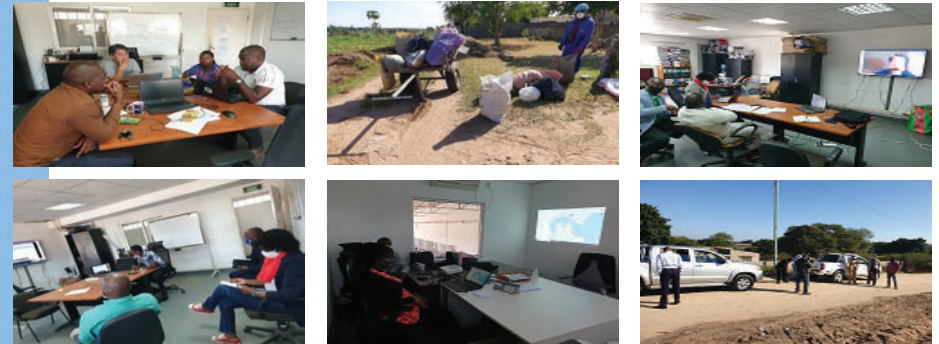
Thank you

## Progress of Output 2 Activities

Strengthened supervision capacity of the waste collection and transportation service.

**[Activity2-1]** Trainings, seminars and workshops were organised for Municipality staff on the supervision of Waste Collection Service Providers (WCSP).

Workplace training workshops are being conducted for C/P



2

**[Activity 2-2]** Study the current situation of the WCSP and their contracts.

The following 6 problems were identified through the current situation survey.

### [Problems]

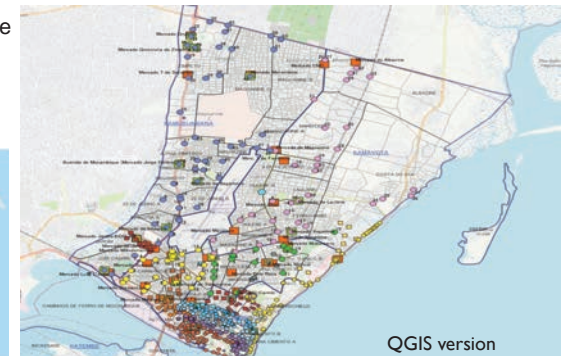
1. Container management
2. Waste quantity management
3. Waste flow management
4. Management of the ME collection service;
5. ToR of the tender and contract of the WCSP;
6. Supervision management;

3

### Problem 1. Container Management

- The number of containers and their location were unknown. Monitoring was defective.

- A container map was created using Google My Maps and QGIS Maps, based on photographic data



activity 2-2

4



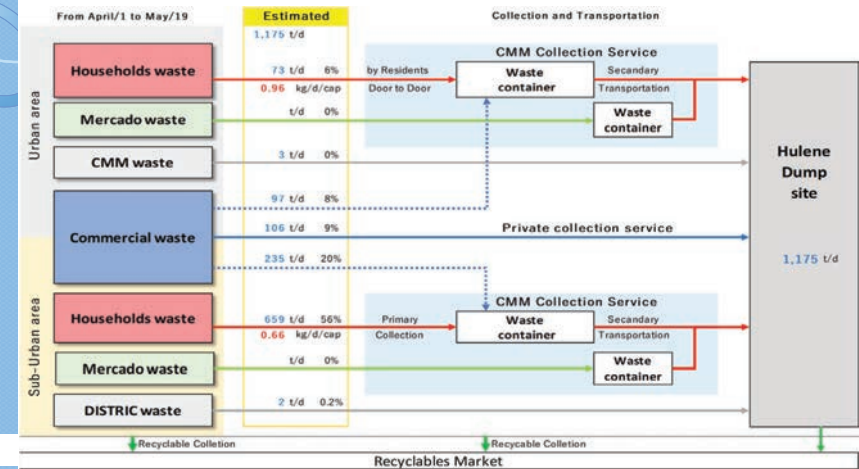
### **Problem 2. Waste quantity management**

- Poor knowledge on the analysis and use of weighbridge data

### **Problem 3. Waste flow management**

- Proper management of commercial waste is not controlled correctly and may be mixed with domestic waste.

- The waste flow was established based on data from the Weighbridge and the container MAP.



### **Problem 4. ME collection management**

The status of the ME collection service (collection route, container usage, etc.) is not fully understood.

- The survey of the ME collection service was carried out in some neighborhoods and interrupted due to Covid-19. It will only resume in September this year;

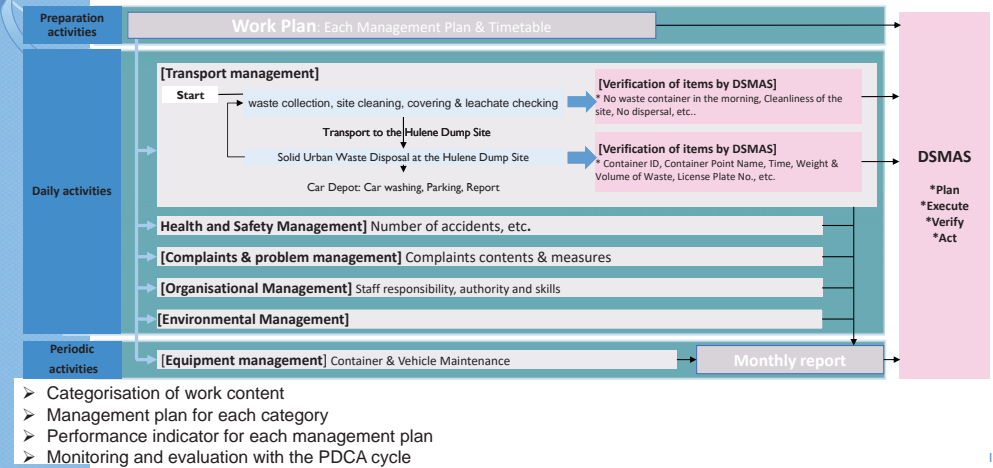
### **Problem 5. Tender & contract ToRs for WCSPs**

- The format and content of the documents (Work Plan, monthly report, etc.) to be submitted to the WCSP is not specified.
- DSMAS monitoring items are not sufficiently clear.
- Bidding and contracting procedures require coordination with the Municipality, and delays in WCSP contracting operations are common.

## Problem 6. Supervisory management

- The RFM inspection and monitoring items are not clear, monitoring data is not stored, and related departments are not linked.
- The MOPA system is currently not operational. It requires a contract with the supplier.
- Insufficient coordination with Districts & Neighborhoods.

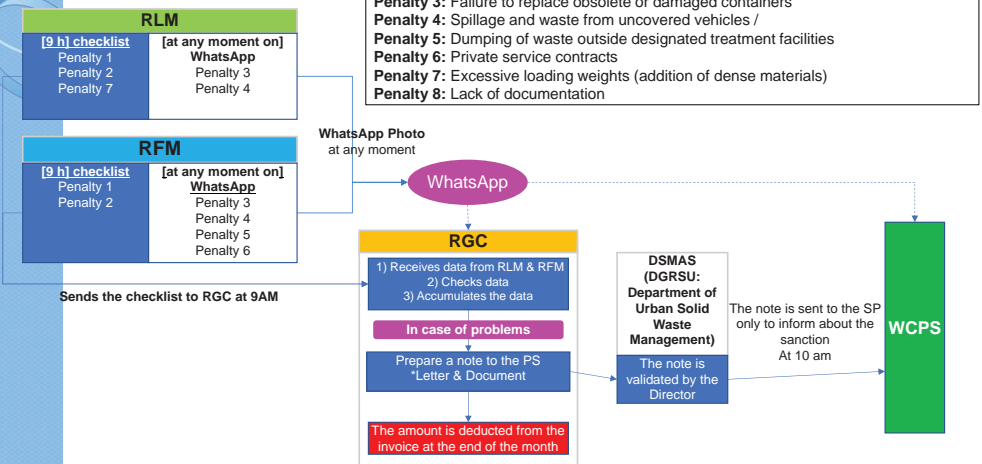
**[activity 2-4]** Examine the revision of the contract with Waste Collection SP to improve waste collection.



## Review of current WCSP contract and preparation of contract management flow

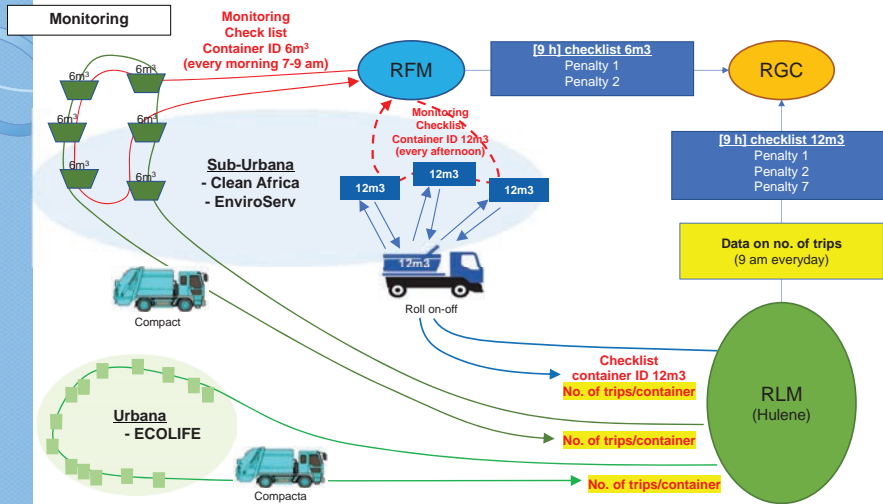
Terms of the tender document	Content of the documents submitted	Check before starting	3.4 monitoring item		RGC in Office		3.5 Inspection	3.7 Performance and sanctions
	Work plan	(kind of inspection)	RFM in field	RLM in Hulene	3.4.2 Reported item	Emergency report		
<b>2.5 Service Conditions</b> Hours and frequency, Collection Points								
<b>2.6 Equipment</b> Containers, Collection Vehicles, Other Equipment, Proposed Equipment Numbers, Supervision Vehicle								
<b>2.7 Operation and maintenance of the equipment</b> Registration and compliance with local legislation, environment and safety conditions								
<b>2.7.3. Maintenance (periodic)</b> Vehicles, Containers, Replacement of obsolete equipment and vehicles, Log books and other documents.								
<b>2.8 Staff</b> Work Language, Minimum Presentation Requirements, Proposed Staff, facility								
<b>2.9 Health and Safety Requirements</b> Protective Equipment, Fire Control and Accident prevention Equipment								
<b>3.6. Complaints</b>								

## DGRSU Monitoring Procedures by Department





### Monitoring trial (Clean Africa collection area)



**[activity 2-3]** Develop a preliminary plan to optimize the waste collection and transportation service throughout the Municipality area

- Activity 2-3 will be implemented after completion of the analysis of the contract management and monitoring method for the collection services for the new WCSPs.
- Analysis of the need for the Transfer Station for the new landfill sites has begun.



## Progress of the Project Activities



### -Output 3 -



### Minimizing waste generation and promoting 5Rs.

#### [Activity 3-1] Formulate a strategy for minimizing waste generation

- Basic approaches to promote 5R:
  1. Establishing an institutional framework to promote 5R activities;
  2. Promoting awareness-raising activity on 5R for all waste generators;
  3. Promoting 5R activities in the urban area, in collaboration with recycling-related actors,
  4. Promoting 5R activities in the suburban area, by DSMAS's initiative.

## Activities for Output 3

- 1 - Formulate a strategy for minimizing waste generation;
- 2 - Plan appropriate source separation method and necessary rules;
- 3 - Plan appropriate segregation method of hazardous waste from MSW;
- 4 - Implement PP on source separation to verify the feasibility of source separation;
- 5 - Organizing training & workshop for supervision, guidance and enforcement of PP;
- 6 - Promote a market of recyclables for informal waste pickers;
- 7 - Networking among recycling industries in Mozambique;
- 8 - Study incentive mechanism for promoting recycling.

#### [Activity 3-2] Plan appropriate source separation method and necessary rules

##### ➤ ***Target items subject to source separation***

- ✓ Paper (white paper, newspaper, cardboard, etc.)
- ✓ Plastic (PET bottle, HDPE, PP, etc.)
- ✓ Metal (Aluminum, Steel, etc.)
- ✓ Glass (Not broken glass bottle)

Rules on source separation will be examined after implementation of PP.

### [Activity 3-3] Plan appropriate segregation method of hazardous waste from MSW

In this activity, a system for the separation and collection of municipal hazardous waste will be examined.

- As a result of the survey conducted by the project team in 2020, Mavoco landfill was identified in Maputo Province that can receive some types of hazardous waste.
- It is intended to include hazardous municipal waste (batteries and fluorescent lamps) in the target items subject to separation at source, and DSMAS will collect them.

[Activity 3-4] - Cont.

**Identified actors working in recycling and the recyclable items they handle**

Recycler	Paper	Plastic	Metal	Glass
COMSOL	X	X		X
PAGALATA	X			X
Recic-Moz		X	X	
RLR	X	X	X	X
Reciclagem e Serviços		X		
Nhassengo Comercial			X	
Oliveiras Multi-Service			X	
RECONICE			X	
Repensar				X
Replasa, Lda		X		
TOPACK		X	X	
Lisorte		X		

### [Activity 3-4] Implement PP on source separation to verify the feasibility of source separation

#### Ongoing Activities:

Source Separation PP at CMM offices and MTA

Objective:

Verifying feasibility of source separation at CMM and MTA offices aiming at expanding to other offices and households in Maputo City in future.

Location:

DSMAS (6 stations)

CMM City hall

District Offices of KaMavota, KaMubukwana

Ministry of Land and Environment



[Activity 3-4] - Cont.

**Potential partners:**

**Recyclers:**

Fapacar (paper), Valor Plastico (plastic), TOPACK (plastic, metal), 3R (metal, glass) Repensar (glass)

**Collector:** (to be identified )

The project team will focus on researching potential partners for PP, as well as discussing the organization and training needed for source separation in the CMM offices.

DSMAS may consider providing collection & transportation service by itself. 1-2 times per month collection will be enough.

[Activity 3-4] - Cont.

## Actividades Actuais e Prespectivas

- Source separation trial phase at DSMAS offices started on June 2, 2021;
- In the next few months, the survey to identify container placement points in CMM, MTA and Municipal District Administrations offices will begin;
- Procurement of suitable containers for PP implementation;
- Identification of partner who will be responsible for collecting segregated recyclable materials from the CMM and MTA offices and deliver them to recycling related agents.



## Implemented activities

- [Activity 3-5]  
Organizing training & workshop for supervision, guidance and enforcement of PP
- [Activity 3-7]  
Networking among recycling industries in Mozambique

## Activities that will be implemented in the last stage of the project

- [Activity 3-6]  
Promote a market of recyclables for informal waste pickers
- [Activity 3-8]  
Study incentive mechanism for promoting recycling

***United and Together Let us Upgrade Maputo***

***Thank you for Your Attention***

Thank you very much

## Output 5 Financial, Organisational & Institutional Capacity.

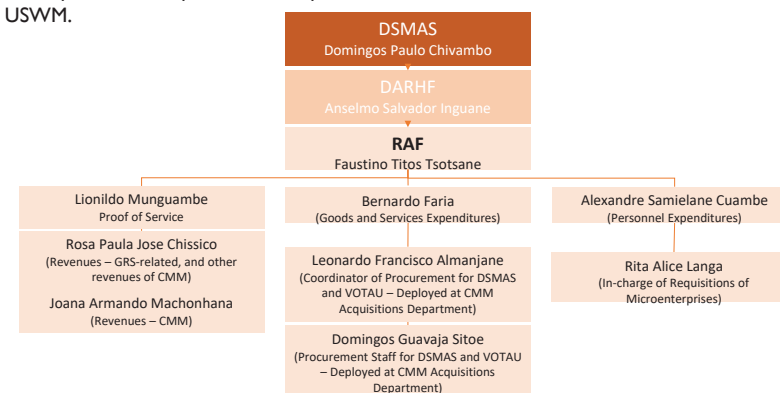
- **Activity 1** - Review, analysis and evaluation of the current financial management of the SWM;
- **Activity 2** - Propose a financial plan to ensure cost recovery of SWM costs by the CMM;
- **Activity 3** - Review, analyse and evaluate the institution's current organisation for SWM in CMM;
- **Activity 4** - Propose a plan to update the ordinance and other legislation of CMM related to SWM;
- **Activity 5** - Propose an organisational and human resource development plan for CMM/DSMAS.

1

## Output 5 - Financial, Organisational & Institutional capacity

### Activity 1 - Review, analysis and evaluation of the current financial management of the SWM

The DARHF – Department of Administration, Human Resources and Finance, besides managing the human capital of this department is responsible for the administration of financial resources related to USWM.



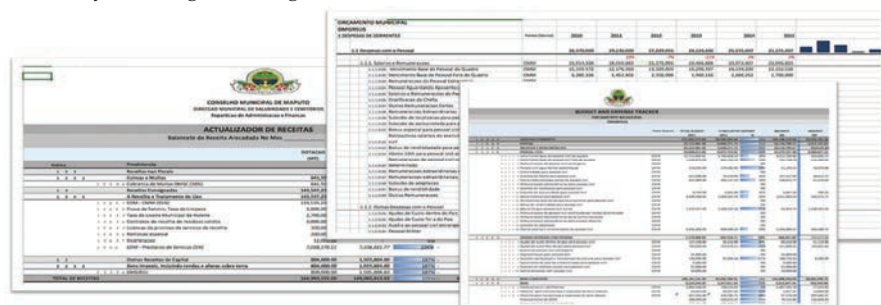
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## Output 5 - Financial, Organisational & Institutional capacity

### Activity 1 - Review, analysis and evaluation of the current financial management of the GRS

Use of models to simplify registration, reporting, and analysis

- Revenue Update Model,
- Budget and Expense Tracking Model,
- Activity Planning and Budget Model.



3

## Output 5 - Financial, Organisational & Institutional capacity

### Activity 1 - Review, analysis and evaluation of the current financial management of the GRS

#### Budget performance management through revenue and expenditure control

The Budget Tracking model was a tool developed to control whether the financial resources are sufficient to cover expenses, or whether expenses are already going over budget (approved budget and executed budget).

#### Proper collection of cleaning fees

Actual collections fell short of targets, requiring realistic target projections;

- The cleaning fee collected by EDM contributed 90%-92% but, there is pressure for more data sharing by EDM.
- A reliable database providing accurate and up-to-date information.



4



## Output 5 - Financial, Organisational & Institutional capacity

### Activity 1 - Review, analysis and evaluation of the current financial management of the GRS

A reliable database, providing accurate and up-to-date information.

- Companies requesting cancellation of Activities and termination of services are deactivated in the system, but when generating invoices, these are included again;
- There was a wrong classification of the companies, regarding the amount of waste produced and the corresponding fee to be paid;
- DSMAS has pressed for a repair and maintenance contract for the system;



5

## Output 5 - Financial, Organisational & Institutional capacity.

### Activity 2 - Propose a financial plan to ensure cost recovery of GRS costs by the CMM

#### Review of the MP recommendations: revision of the cleaning fee structure

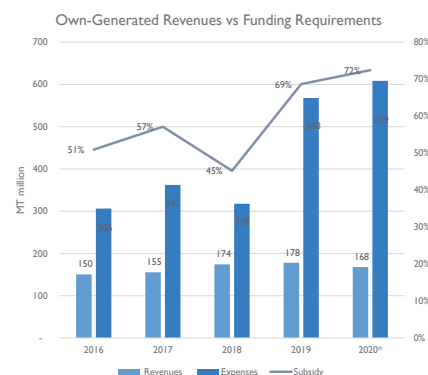
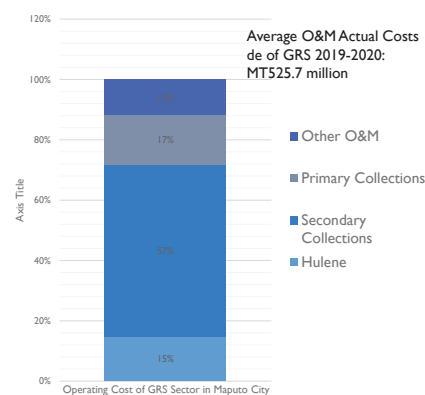
The collection of the cleaning fee is facilitated through automatic inclusion in the electricity bill by the electricity firm EDM, but the current fee structure unfairly burdens poorer households more than wealthier ones;

- It is important to revive the enthusiastic discussions on cost recovery using the most equitable and effective cleaning fee;
- It is also essential to establish contact with the Finance Department of the CMM on this aspect.



## Outcome 5 - Financial, Organisational & Institutional capacity

### Activity 2 - Propose a financial plan to ensure cost recovery of SWM costs by the CMM



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## Output 5 - Financial, Organisational & Institutional capacity

### Activity 2 - Propose a financial plan to ensure cost recovery of SWM costs by CMM

#### Payment of cleaning fee by large waste generators

Registration and invoicing of commercial waste generators have been supported and strengthened, as well as the calculation of the cleaning fee according to the type and scale of businesses, however, DSMAS is still unable to collect the appropriate cleaning fee from many commercial waste generators;

- Revised MP proposes introduction of commercial waste cleaning fee collection system (billing and payment) through WCSP.



Sector de Activity (2020, Jan)	Category					TOT AL	%
	A	B	C	D	E		
Others	-	-	-	-	8	8	0
Hotel	5	5	18	22	58	108	1
Restaurant	1	1	25	49	497	573	6
Public and Social Institutions	1	1	11	21	218	252	3
Private Offices	6	3	23	36	850	918	9
Donors, Intl Agencies, NGOs	-	-	2	-	11	13	0
Commercial, Manufacturing, Industrial	15	18	269	337	7,407	8,046	81
<b>TOTAL</b>	<b>28</b>	<b>28</b>	<b>348</b>	<b>465</b>	<b>9,049</b>	<b>9,918</b>	<b>100</b>
%	0	0	4	5	91	100	

8

## Output 5 – Financial, Organisational & Institutional capacity

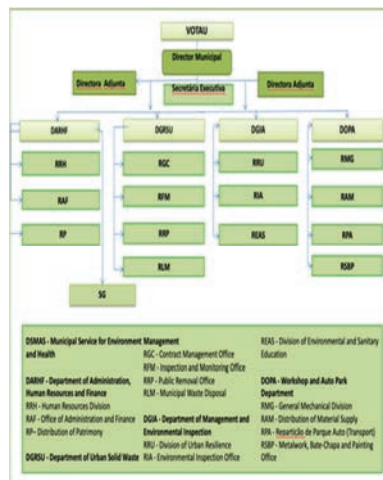
### Activity 3 - Review, analyze and evaluate the institution's current organization for SWM in CMM

#### Analysis of the organizational structure of DSMAS

There has been an organizational reform of the CMM and the project team will review and evaluate the organizational structure and job descriptions of each section and department of DSMAS in order to be consistent with the organizational development plan established in the MP.

#### Analysis of the legislation on SWM

- The project team identified the national laws and regulations on GRS, as well as the CMM's ordinances and standards on SWM.



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## Output 5 - Financial, Organisational & Institutional capacity.

### Activity 4 - Propose a plan to update the ordinance and other legislation of CMM related to SWM

- On this basis, after consultation with the relevant departments of CMM, a plan to update the ordinance and regulations related to SWM in Maputo City will be prepared in the last phase of the project.

### Activity 5 - Propose an organisational and human resource development plan for CMM / DSMAS

- Based on the Outputs of the analysis and assessment of the DSMAS organizational structure the "organizational development plan" in the MP will be updated as necessary in the last phase of the project.

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Muito  
Obrigado!





CONSELHO MUNICIPAL DE MAPUTO  
Direcção dos Serviços Municipais  
de Ambiente e Salubridade



Projecto de Capacitação rumo à  
Materialização da Gestão Integrada de  
Resíduos Sólidos no Grande

## Progress of Outcome 6 Related Activities and COVID-19 Preventive Activities

June 2021

1

### OUTPUT 6 - PUBLIC AWARENESS AND ENVIRONMENTAL EDUCATION

#### 1. Coordination with Relevant Institutions in Promotion of Public Awareness and Environmental Education

Meetings were held with the MTA and the MINEDH and cooperation commitments were confirmed. The action plan for public awareness and environmental education was prepared and a note requesting the appointment of focal points was drafted.



### OUTPUT 6 - PUBLIC AWARENESS AND ENVIRONMENTAL EDUCATION

#### 2. Surveys of Public Awareness and Environmental Education Stakeholders

Interview surveys were conducted with stakeholders in Public Awareness and Environmental Education, including central and local government entities, NGOs and private companies to assess the current situation and engage in collaboration.



### OUTPUT 6 - PUBLIC AWARENESS AND ENVIRONMENTAL EDUCATION

#### 3. Technical Support and Publicity Material for the Cleaner Neighborhood Competition (Videos, Posters, Stickers, banners, educational material, waistcoats, caps, armbands)



## OUTPUT 6 - PUBLIC AWARENESS AND ENVIRONMENTAL EDUCATION

### 4. Social Survey (Municipalities, Schools and MTA and CMM officials)

In the social survey preparation phase, to determine the level of understanding of the Municipalities on the issues related to waste, their behavior regarding waste disposal and the 5Rs

## OUTPUT 6 - PUBLIC AWARENESS AND ENVIRONMENTAL EDUCATION (Continued)

Build on the existing initiatives of Eco-Schools Programme implemented by CMM and some NGOs in primary and secondary schools to enhance 5R related programmes like "SPO GOMI" and collection of recyclable materials in schools. This activity will be implemented after the COVID-19 pandemic stabilizes

### recolha de recicláveis nas escolas



5

6

## COVID-19 PREVENTIVE MEASURES

### 1. Building Capacity of Community Leaders

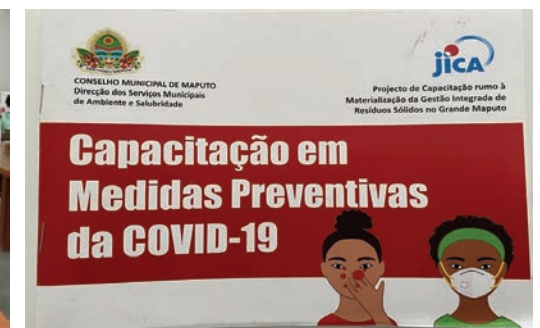


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## COVID-19 PREVENTIVE MEASURES

### 2. COVID-19 Prevention Measures for DSMAS Staff

184 staff members trained.

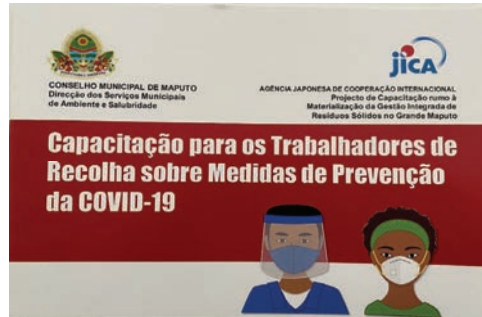




## COVID-19 PPREVENTIVE MEASURES

### 3. COVID-19 Prevention Measures for waste collection workers from micro-enterprises

46 Micro-companies trained.



## COVID-19 PPREVENTIVE MEASURES

### 3.1. Micro-enterprise Monitoring and Second Phase of Distribution of Equipment for COVID-19 Prevention

- Distribution of equipment and posters to raise awareness on COVID-19 prevention measures (46 Micro-enterprises)



## COVID-19 PPREVENTIVE MEASURES

### 4. COVID-19 Prevention Measures for the Waste Pickers of the Hulene Municipal Dump Site

• Nearly 680 waste pickers trained



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de Ambiente e Salubridade



Projecto de Capacitação rumo à  
Materialização da Gestão Integrada de  
Resíduos Sólidos no Grande

Thank you  
Obrigado  
Kanimambo

June – 2021

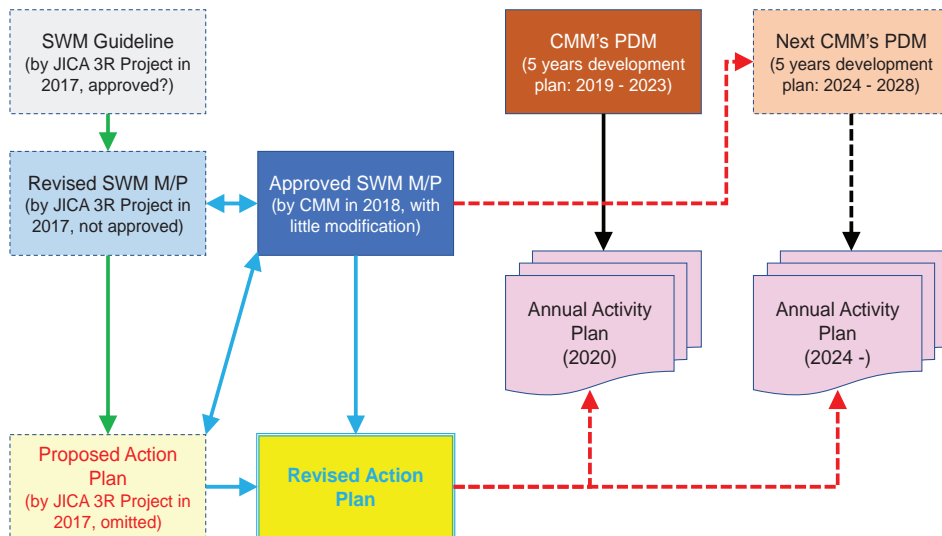
## Major Achievements & Way Forwards

JICA Project Team  
June 2021

### Output 1: Master Plan implementation

- Action Plan of the Master Plan was developed.
  - A/P will be verified and updated as necessary during M/P monitoring.
- Monitoring System to monitor progress of M/P implementation was developed.
  - DSMAS needs to start M/P monitoring based on the developed M/S.
  - Further discussion on the indicators & targets of monitoring system will be conducted.

DSMAS's annual activity plan & budget should be consistent with M/P & A/P

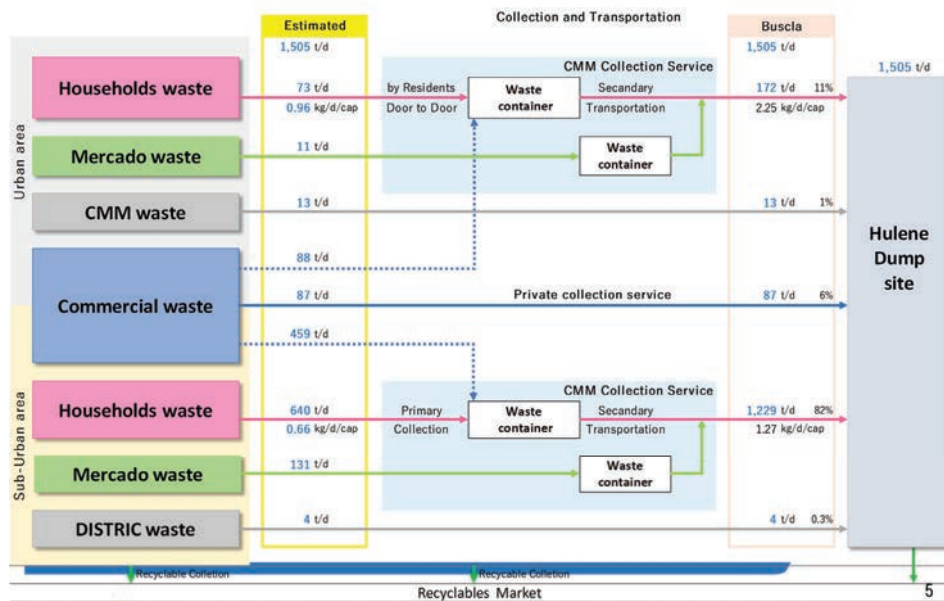


### Output 2: Waste collection & transportation

- Current situation of waste collection system was studied and, major issues were identified.
  - Container management, Waste amount management, Waste flow management, Collection service management, TOR for WCSPs, Inspection management.
- Improvement plan of waste collection & transportation service will be drafted.
  - DSMAS's work procedures for contract management of WCSPs are being examined.
  - Monitoring & control system of waste collection service using ICT will be studied.

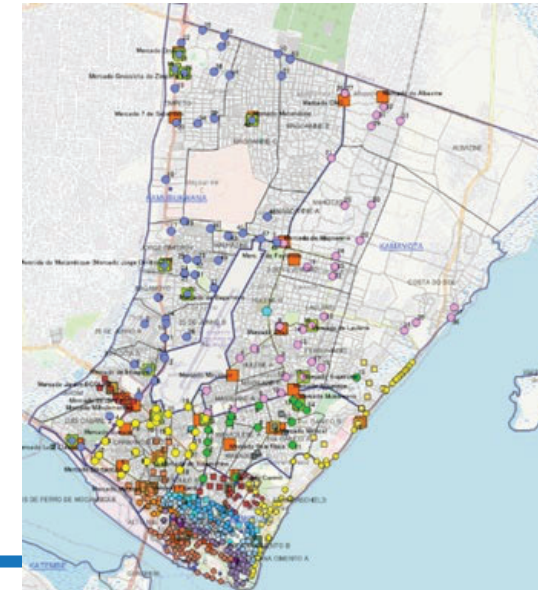
## Estimated waste flow in 2019

-- Contamination of business waste?



## Waste container location map

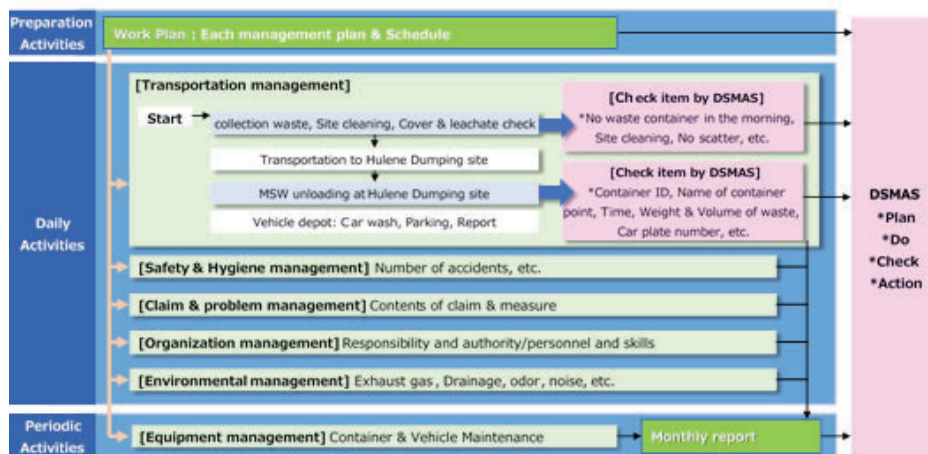
-- Basic information for WCSPs management



DSMAS's work procedure for supervision & monitoring of WCSPs is being discussed.

## Output 3:5Rs promotion

- Plan for source separation pilot project was examined.
  - DSMAS and JET is preparing to initiate the pilot project at DSMAS office, CMM city hall, MTA office and one district office.
- Interviews to existing recycling-related actors were conducted.
  - Networking among the recycling-related actors will be promoted by holding "recycling forum".





## Preparation of source separation pilot project waste segregation bins, instruction material, etc.



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## Output 4: Landfill operation & management

- Progress of Mathlemele landfill, Katembe landfill & Hulene dumpsite improvement/closure projects were followed-up.
  - It is necessary to continue coordination meetings with FNDS, Matola City, WB & MOEJ.
- Guideline on sanitary landfill operation & management will be prepared.
  - Lecture & training for C/Ps based on the prepared guideline will be provided.

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## Output 5: Financial, organizational & institutional management

- Improvement of financial data management was continued by introduced templates
  - Revenue updater, budget & expense tracker and activity & budget planning model.
  - DSMAS's budget planning process for 2022 will be observed and technical support will be provided.
- Current status of organizational & institutional management was reviewed.
  - DSMAS's new organizational structure was studied.
  - Laws & regulations on SWM were collected and reviewed.

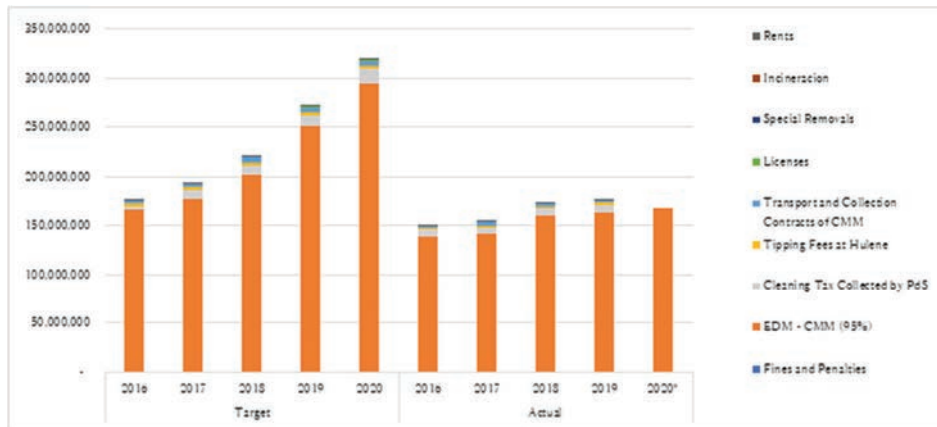
11

Improvement on the variation between approved & executed budgets was observed.  
--- difference between CMM and DSMAS reports?



12

EDM-collected cleaning tax contributes 90%-92% of total revenue of the sector.  
 --- but the revenue targets seems unrealistic.



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## Measures for improving cost recovery

- **More data sharing from EDM on cleaning tax.**
  - Number of connections per consumer type,
  - Number of new connections per consumer type,
  - Payments collected per consumer type, etc.
- **Improvement of Proof of Service (PdS) database**
  - Need to improve cleaning tax collection from large (business) waste generators.
  - It will be also necessary to examine cleaning tax collection system from large waste generators.
- **Examination on cleaning tax tariff**
  - WB project is planning to introduce 'drainage tax' through water bill.

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## Output 6: Public Awareness (PA) and Environmental Education (EE)

- **Action Plan for Output 6 was drafted.**
  - Consultation meeting on the drafted Action Plan with MTA and MINEDH is being coordinated. Working group with ministries will be organized.
- **Interviews to existing actors engaged in PA and EE were conducted.**
  - Collaboration with potential partners (NGOs, private companies, etc.) in PA and EE area will be promoted by holding the regular meeting.

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## • Following activities are planned.

- (1) Public Awareness-raising activities:
  - Strengthen the Cleanest Neighborhood Contest.
- (2) Environmental Education for children:
  - Strengthen the Eco School Program incorporating the 5Rs concept in primary schools.
- (3) Collaborative activity with Output 3:
  - Prepare the teaching materials and conduct awareness-raising activities for source separation and recycling pilot project in the buildings of CMM and MTA.

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- **Social survey will be conducted.**

- Collect the baseline data of PDM indicators such as Maputo citizens' satisfaction and cooperation with the MSWM, and awareness and behavior regarding waste disposal and 5Rs.
- Understand the current status of the target groups of aforementioned activities including their attitude and behavior.

No.	Target	Number of samples	Methodologies	Note
1-1	Residents	620	Face to face interviews based on a questionnaire	20 for KaNyaka district and 100 each for the other districts
1-2	Bairro secretaries and block leaders	70	Face to face interviews based on a questionnaire	10 for each district including KaNyaka
2	Elementary Schools	10	Semi-structured interviews	Potential target schools for DSMAS and schools where NGOs are active.
3	CMM and MITA officials	100	Face to face interviews based on a questionnaire	20 for each building

## Output 7: Maputo model

- **General concept & composition of 'Maputo model' was discussed & agreed.**
- **Communication with MTA, Matola City & ANAMM has been started.**
  - It is necessary to accelerate coordination & collaboration with the relevant organizations.
  - MTA is requested to provide SWM datasheets of Maputo, Matola, Beira & Nampula cities.

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## Proof of Service Seminar in Matola City (28<sup>th</sup> May 2021)



19

## COVID-19 prevention measures

- **Equipment for COVID-19 measures was procured and a handover ceremony was held on 30<sup>th</sup> October.**
- **Trainings were conducted using materials developed for each target, and equipment was distributed.**



Masks (2,150), Gloves (1,750), Face Shield (1,950), Hand sanitizer (1,200), Hand soap (1,450), Medical thermometer (61), Sanitizer for equipment (47), Sprayers (97)

### DSMAS Staff (Targets:183 persons, Training period: from 15 to 23 October 2020)



## Collection Workers (Targets: 46 microenterprises, 934 workers, Training period: from 23 to 27 November 2020, 10 May 2021)



## Waste Pickers (Targets: 800 persons, Distribution: 22 December 2020)



## Communities (Training: May 2020)



- Supervise and instruct large-scale waste collection service providers (WCSPs)
- DSMAS and JET interviewed large-scale WCSPs about the impact of COVID-19 on collection service and their measures.
- Based on Japan's "Guidelines for COVID-19 Control in the Waste Management Industry," measures in waste collection operations were introduced to large-scale CSPs.
- Measures for waste generated in hospitals
  - DSMAS and JET interviewed Directorate of Health of Maputo City (MOH) to confirm the management of infectious waste generated in hospitals.
    - According to the MOH, private medical institutions are not well managed and may be discharging their waste into the municipal waste collection route by CMM/DSMAS. Therefore, the Project requested the MOH to strengthen the guidance on the discharge of infectious wastes to private medical institutions.

## • Loss of equipment and response

- On 21 December, it was discovered that some of the equipment (185 gloves, etc.) had gone missing from the DSMAS's warehouse. This was reported to the Mayor, the Councilor and JICA, as well as to the police.
- In order to prevent recurrence, the Project is examining the current status of inventory management in the warehouse and discussing about the appropriate way of management, and plans to prepare a management manual.



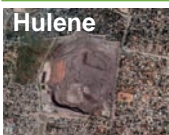
Thank you

# Status of Japanese and Other Donor's Support related to the Project and Importance of their Collaboration

JICA Expert Team  
June 2021

## Output 4 (Landfill Operation) and 2 (Waste Collection) related Projects

- **MOEJ** : Rehabilitation work for the collapsed area, technical support for the landfill operation applying **Fukuoka Method**.
- **EOJ** : Heavy equipment (4 excavators, 2 bulldozers)
- **WB** : Safety closure including stabilization of **unstable slopes**, composting facility, etc.

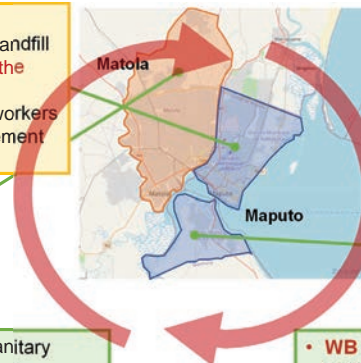


### JICA (Output 4)

- Preparation of a guideline on landfill operation that can be used **at the new sanitary landfill**.
- Conduct training courses for workers on landfill operational management **at the new sanitary landfill**.



- **Korean Eximbank/FNDS** : Sanitary landfill, material recovery facility



### JICA (Output 2)

- Consideration of waste collection and transportation distances **to the new landfill** and transfer station locations.

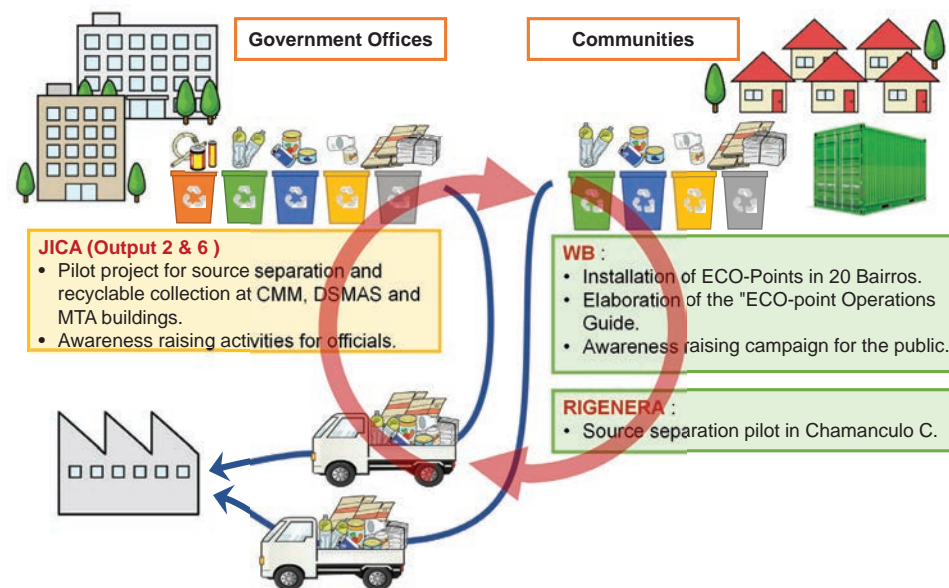


- **WB** : Sanitary landfill, material recovery facility

## Related Projects for Each Output

JICA Project		Related Projects by Other Donors
Output1	Analyzing current issues & challenges of SWM	
Output2	Waste collection & transportation service	
Output3	Minimizing waste generation and promoting 5Rs	<b>WB, RIGENERA (Italian NGO)</b>
Output4	Landfill operation and management	<b>MOEJ, EOJ, Korean Eximbank, WB</b>
Output5	Financial, organizational and institutional capacity	<b>WB</b>
Output6	Public awareness (PA) and environmental education (EE)	<b>WB</b>
Output7	Compiling "Maputo model" and its dissemination	<b>NAMA-Facility</b>

## Output 3 (5R Promotion) and 6 (PA&EE) related Projects





## Output 5 (Financial Capacity) related Projects

### JICA (Output 5)

- Revising the cleaning fee structure and rate to achieve more equitable pricing and cost recovery for the sector.

### WB

- Establishing the drainage tariff.
- Electronic property tax billing and payment system that includes the solid waste tariff and the new drainage tariff adopted.

## Output 7 (Maputo Model) related Projects

### JICA (Output 7)

- Summarizing a series of practices done by the Project as "Maputo Model" and disseminate it to the municipalities in Mozambique.

### NAMA-Facility

- Target: Pemba, Nacala, Beira, Nampla, Tete
- Implementation of the existing Regulation on Extended Producer Responsibility.
  - Waste treatment infrastructures.
  - Institutional capacity building.
  - Sharing experiences to other municipalities.

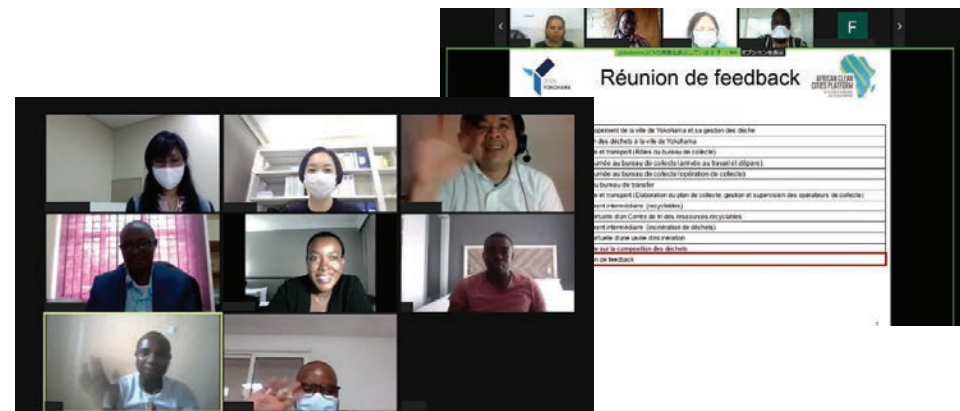
## Related JICA Training Programs

### ① Sustainable Solid Waste Management for African Countries A

**Mr. Domingos Chivambo, Director**

**Mr. Sergio Manhique, Chief of Department of Urban Solid Waste Management**

- Online training: 14<sup>th</sup> – 28<sup>th</sup> January 2021
- ~~Training in Japan: 16<sup>th</sup> – 29<sup>th</sup> May 2021~~
- Language: English
- Online follow-up training: 17<sup>th</sup> May – 2<sup>nd</sup> July 2021**



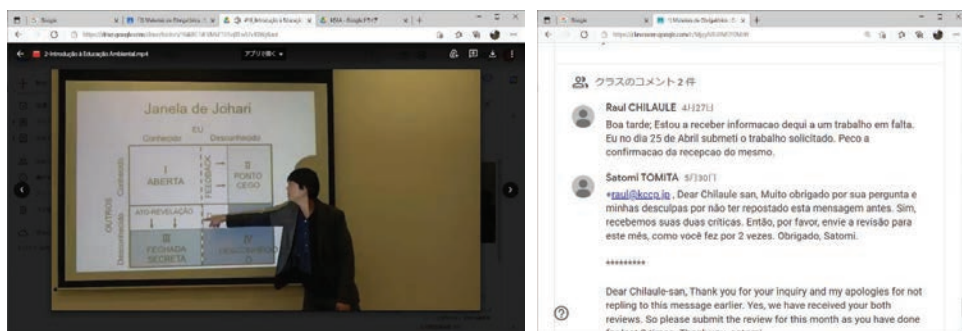
## Related JICA Training Programs

### ② Solid Waste Management towards Recycle Oriented Society (Emphasis on Partnership between Public Entities and Citizens) (B)

**Mr. Raul Chilaule, Chief of Department of environmental management and inspection**

**Mr. Cêsar Mazive, Head of Waste Management Division of Infulene, Matola**

- Online training: 1<sup>st</sup> March – 30<sup>th</sup> September 2021
- Training in Japan: 25<sup>th</sup> October – 4<sup>th</sup> December 2021
- Language: Portuguese



## Related JICA Training Programs

### ③ Design and Maintenance of Semi Aerobic Landfill Site (FUKUOKA METHOD)

- Online training : Late September – late October
- Language: English
- Candidate selection will be carried out.

### ④ Master Degree Scholarship Program: Creating Leaders for African Clean Cities

**Mr. Hélder Langa, Technician of Department of Urban Solid Waste Management**

- Course period in Japan: September 2021 – September 2023
- Language: English



## African Clean Cities Platform : ACCP

ACCP is a platform to share knowledge and promote the SDGs on waste management in Africa with the aim of African countries realizing clean and healthy cities. It was established in Maputo, Mozambique in April 2017 with the initiatives of the Ministry of the Environment of Japan, JICA, UNEP and UN-Habitat and City of Yokohama.



## Elaboration of functional Knowledge Sources



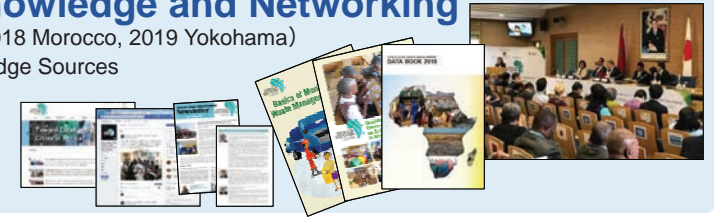
Facebook  
Website

<https://www.facebook.com/ACCP2017/>  
<http://AfricanCleanCities.org/>

## Objectives and Activities of ACCP

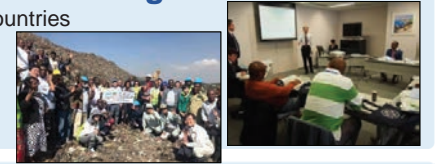
## Sharing of Knowledge and Networking

- General Meetings (2018 Morocco, 2019 Yokohama)
- Elaboration of Knowledge Sources



## Promotion of SDGs targets on Waste Management

- Training program in Japan / Study tour in African countries
- Pilot Study for SDGs Monitoring



## Promotion of investment in Waste Management

- Promoting participation of donor countries and international organizations
- Discovering Japanese cooperation projects
- Provision of information and opportunities to the private sector



## Related JICA Volunteers

### ① Volunteer for Environmental Education in CMM/DSMAS

- The earliest dispatch is December 2021.

## ② Volunteer for Environmental Education in Matola

- The earliest dispatch is July 2022.

## Output 6

- Environmental education at schools.
- Awareness raising activities for citizens.

## Output 7

- Dissemination of “Maputo Model” to the municipalities in Mozambique.





### AGENDA of the 4th Joint Coordination Committee Meeting

- Date: 22 June 2022 (Wednesday)
- Time: 13:00 to 16:00
- Venue: DSMAS Office Meeting Room (connected to Zoom)
- Agenda:

Time	Agenda	Presenter/in-charge
12:30-13:00	<i>Registration/Preparation</i>	DSMAS/JET
13:00-13:10 (10 min)	Introduction of participants	Mr. Martins, Chief of Section, DSMAS
13:10-13:20 (10 min)	Opening remarks by CMM	Mr. Silva Magaia, Councilor, CMM
13:20-13:30 (10 min)	Opening remarks by JICA	Mr. Kobayashi Deputy chief representative of JICA Mozambique office
13:30-13:50 (20 min)	Proposal on revision of Project Design Matrix (PDM) and Plan of Operation (PO)	Mr. Hosono, Chief adviser, JET
13:50-14:10 (20 min)	Lessons learnt from the supervision & monitoring activities of waste collection service (Output 2)	Mr. Sergio, Director, DSMAS
14:10-14:30 (20 min)	Promotion of source separation pilot project in DSMAS office (Output 3 and Output 6)	Ms. Rute, Chief of Section, DSMAS
14:30-15:00	<i>Break</i>	
15:00-15:20 (20 min)	Financial status of DSMAS and proposal on cost recovery measures (Output 5)	Ms. Ace Expert, JET
15:20-15:50 (30 min)	Overall discussion	All/ Ms. Stela, Deputy Director, DSMAS
15:50-16:00 (10 min)	Closing remarks by CMM	Mr. Silva Magaia, Councilor, CMM

- End of document -



# Proposal on revision of Project Design Matrix (PDM) and Plan of Operation (PO)

JICA Project Team  
22nd June 2022

## PDM & PO

- **Project Design Matrix (PDM)**
  - A table summarizing activities, inputs, outputs, objectives, and other components of a project, together with their logical interrelationships.
- **Plan of Operation (PO)**
  - A planning chart showing implementation timing & duration for each activity on PDM.

## Structure of PDM

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
<b>Overall Goal</b> What will be aimed at after the project purpose is achieved?	Standard for measuring project achievement	Data sources from which indicators are derived.	Conditions important for the project.
<b>Project Purpose</b> What should the project achieve within the project duration.			
<b>Outputs</b> How should the project achieve the Purpose.			
<b>Activities</b> What should be done concretely to achieve the Outputs?	<b>Inputs</b> Purpose, materials, equipment, facilities, and funds required by the project.		<b>Pre-conditions</b>

3

## Structure of PDM

Narrative Summary	Verifiable Indicator	Means of Verification	Important Assumption
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<b>Activities</b> What should be done concretely to achieve the Outputs?	<b>Inputs</b> Purpose, materials, equipment, facilities, and funds required by the project.		<b>Pre-conditions</b>

4

## Necessity of revising PDM & PO

- PDM & PO (version 0) is attached in the Record of Discussions (R/D) for the Project as of July 2019.
- PDM & PO (version 1) was discussed and agreed in the 1<sup>st</sup> JCC meeting held in January 2020.
  - Some indicators & means of verification in the PDM were determined.
  - PO for outputs with the schedule for each activity were determined.
  - Restructuring of CMM (DMSC→DSMAS), unification of terminology, etc. were reflected.
- It is necessary to revise PDM (as version 2).
  - Reflecting the recent changes of project's plan and circumstances.
  - Determining the remained indicators and means of verifications.

5

## Overall goal [Unchanged]

Integrated solid waste management (ISWM) is established in a sustainable manner in Maputo City and the 'Maputo model' is disseminated to other cities.

### Indicators

1. MSW collection rate increases from \*\*% to \*\*%. (SDG 11.6.1)
2. MSW recycling rate increases from \*\*% to \*\*%. (SDG 12.5.1)
  - \* Current values & target values will be determined by the end of the project.
3. The concept of the 'Maputo model' is disseminated inside/ outside Mozambique.

7

## Project outline

- Project title:
  - Project for Capacity Development to Realize Integrated Solid Waste Management in Great Maputo
- Project duration:
  - November 2019 – October 2023 (47 months)
- Target group:
  - Maputo City Council (CMM) and citizen of Maputo City
- Target area:
  - Maputo City (and Matola City for Output 4 & Output 7)

\* Project duration was extended for 10 months due to impact of COVID-19 pandemic as agreed in R/D as of August 2021.

6

## Project Purpose

The capacity for implementing ISWM is enhanced based on the SWM Master Plan (M/P) of Maputo City, and the capacity development experience is summarized under the name of the 'Maputo model'.

### Indicators

1. The progress rate of the SWM M/P implementation increase from 15% at the beginning to 67% at the end.
2. MSW collection service coverage (number of bairros where waste collection service is provided) is improved from 56 (89%) at the beginning to 58 (92%) at the end (SDG 11.6.1)

8

## Project Purpose (cont.)

### Indicators

3. Amount of collected recyclables by source separation at CMM/DSMAS and the related organizations increases from 0 kg/month at the beginning to 100 kg/month at the end. (SDG 12.5.1)
4. The average score of the capacity assessment at the organizational level shows an improvement from 2.2 at the beginning to 3.5 at the end.
5. The average score of the capacity assessment at the individual level shows an improvement from 2.8 at the beginning to 4.0 at the end.

9

## Project Purpose (cont.)

### Indicators

6. The citizen's satisfaction and cooperation on SWM in Maputo City show an improvement from 70% (satisfaction) and 82% (cooperation) at the beginning to 80% (satisfaction) and 90% (cooperation) at the end.
7. Draft regulation on source separation and the updating plan of ordinances and regulations on SWM is approved by CMM.

10

## Output 1 (M/P monitoring)

The capacity for analyzing current issues and challenges of SWM in Maputo City is enhanced.

### Indicators

1. Action Plan for the M/P is prepared.
2. Monitoring System for the M/P is established.
3. Periodical monitoring on the revised M/P is implemented.
4. Mid-term review report of the M/P is prepared.

### Additional Activities

- Activity 1-6: Update the A/P and the M/S in accordance with results of the M/P monitoring.
- Activity 1-7: Prepare a mid-term review report of the M/P.

11

## Output 2 (collection & transportation)

The capacity for supervising the waste collection and transportation service is enhanced.

### Indicators

1. The draft plan to optimize waste collection & transportation service in Maputo City is prepared.
2. Revision of contracts with the WCSPs is proposed in accordance with the draft plan.

### Additional Activities

- Activity 2-3: Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area (including plans for waste transportation to Mathlemele and Katembe landfills and management of business waste).

12

## Output 3 (recycling)

The capacity for minimizing waste generation and promoting 5Rs (Rethink, Refuse, Reduce, Reuse, Recycle) are strengthened.

### Indicators

1. More than 3 offices of CMM and the related organizations introduce the source separation PP.
2. Amount of collected recyclables by source separation at DSMAS doubles (30 kg/month) from the start of the pilot project.
3. Draft regulation on source separation is prepared.
4. The recycling forum is organized biannually.

13

## Output 4 (landfill operation & management)

The technical capacity for operation and management of final disposal is enhanced.

### Indicators

1. The guideline on sanitary landfill operation and management is prepared.
2. More than 50 staff participates in the training on sanitary landfill operation and management.

14

## Output 5 (finance, organization & institution)

The financial, organizational, and institutional capacities in SWM are enhanced.

### Indicators

1. The financial plan for cost recovery on SWM is proposed.
2. The updating plan of ordinances and regulations on SWM is proposed.
3. The plan for organizational and human resource development in DSMAS is proposed.

### Additional Activities

- Activity 5-2: Propose a financial plan for ensuring the cost recovery of SWM by CMM (including cleaning tax reform and charging system for business waste generators).

15

## Output 6 (environmental education)

The capacity for raising public awareness on the environment including waste issues and environmental education at various levels are strengthened.

### Indicators

1. The percentage of administrative officers who understand and act on 5Rs concept and garbage disposal rules increase from 11.5% (understanding) and 50.9% at the beginning to 70% and 80% at the end.
2. Awareness-raising and environmental education activities in which the Project is involved are conducted 20 times.

16

## Output 7 (Maputo Model)

The experience of realizing ISWM in Maputo city is summarized as the 'Maputo model' and disseminated to other cities.

### Indicators

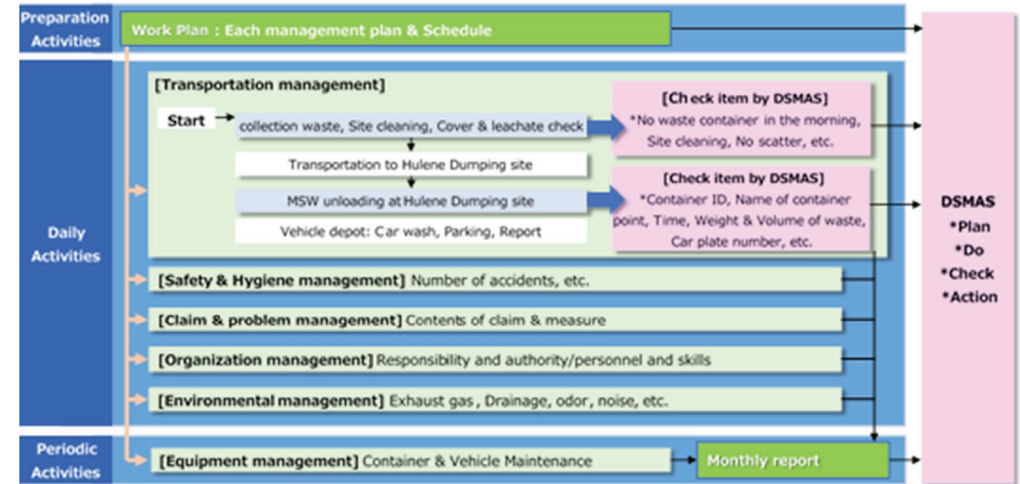
1. The 'Maputo model' is compiled.
2. A dissemination plan of the 'Maputo model' is prepared.
3. A national seminar on the 'Maputo model' is organized.

Thank you

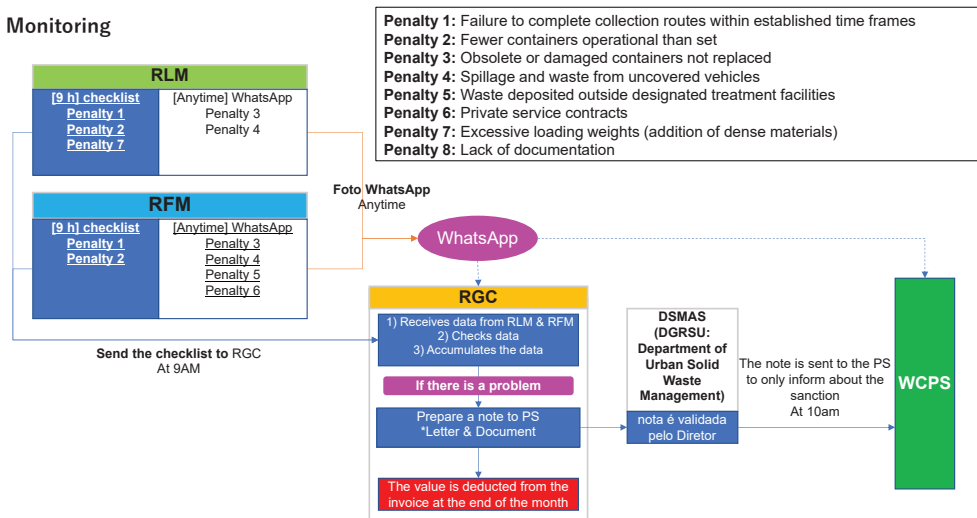
## OUTPUT2

- Activity 2-1:** Organize training, seminars, and workshops for CMM officers for supervising the WCSP
- Activity 2-2:** Study the current situation of the WCSPs and their contracts
- Activity 2-3:** Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area
- Activity 2-4:** Examine revision of the contracts with the WCSPs for improving waste collection service
- Activity 2-5:** Study monitoring and control system of waste collection service using ICT

**Activity 2-4:** Examine revision of the contracts with the WCSPs for improving waste collection service

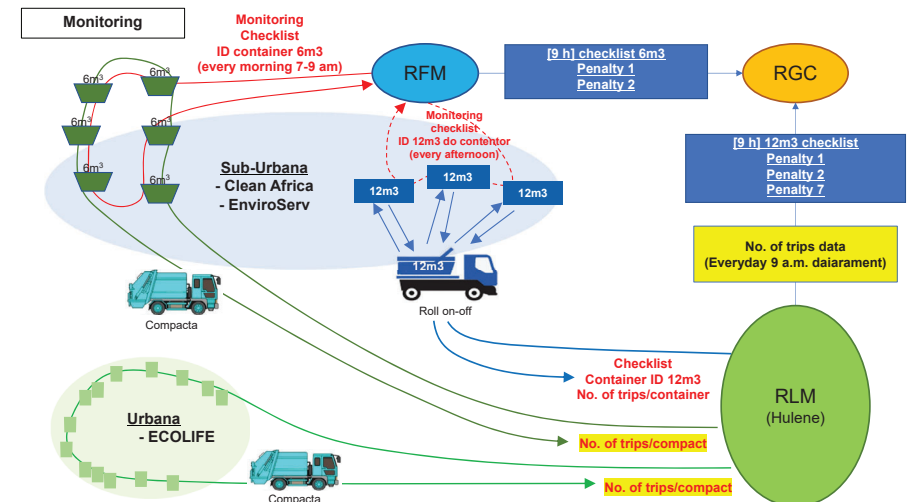


### Monitoring

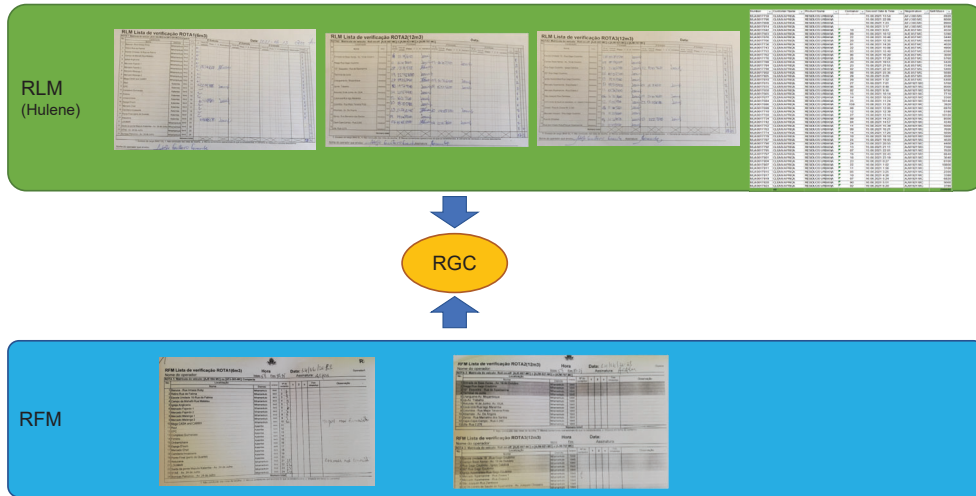


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### Trial Monitoring (Clean Africa area)



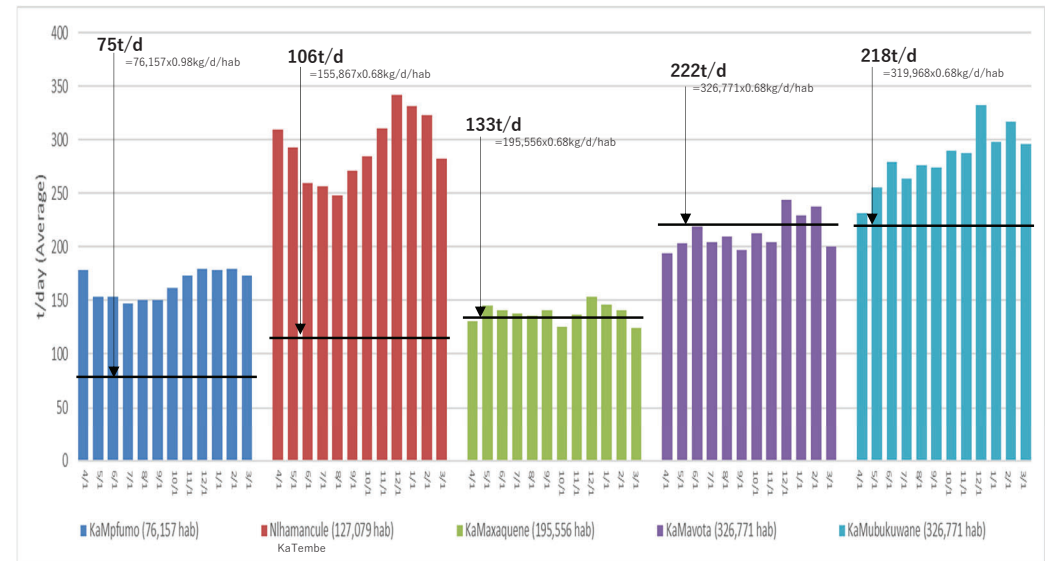
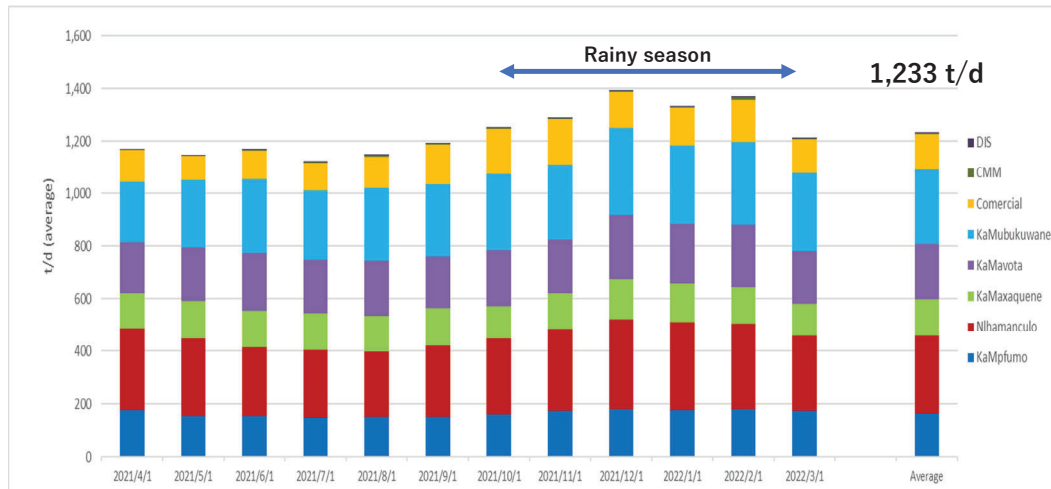
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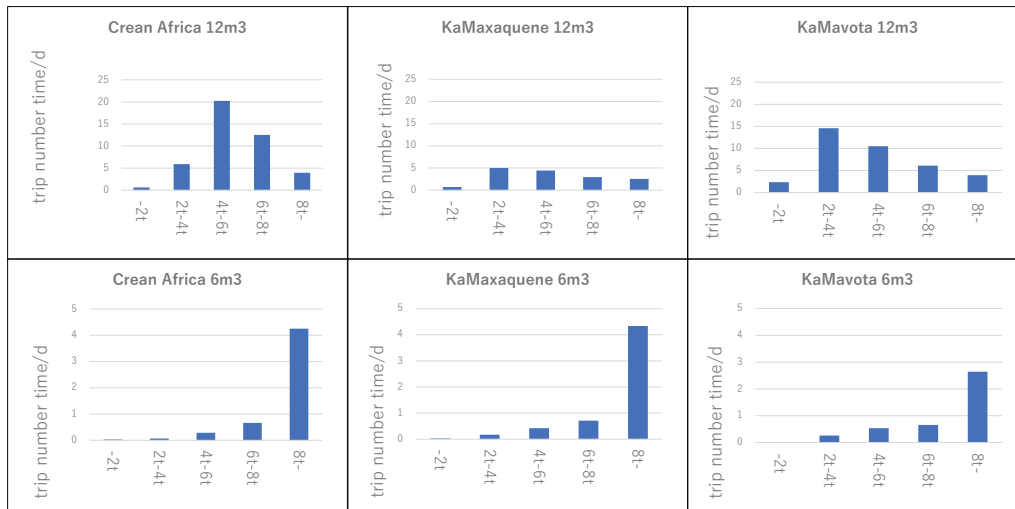
Track scale data																																MZN 2,320	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total	
AKT 596 MC	12m3	38	47	45	44	37	40	36	47	44	39	48	42	47	33	44	50	43	42	47	44	43	43	41	41	50	44	41	42	43	30	1,274	MZN 2,955,298
AJW 921 MC	12m3	22	24	22	23	19	19	17	23	20	21	24	20	22	19	19	23	22	22	22	20	23	21	21	24	20	21	17	19	14	625		
	6m3	16	23	23	21	18	21	19	24	24	18	24	22	25	14	24	27	21	20	25	22	23	20	20	20	26	24	20	25	24	16	649	
AJE 856 MC	6m3	4	6	5	5	5	3	5	4	6	4	4	5	4	2	4	5	5	3	5	5	4	4	5	6	5	5	5	6	5	139		
AFJ 383 MC	6m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	5	4	6	5	28	
penalização		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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Ruta2+Ruta3	12m3	38	47	45	44	37	40	36	48	44	39	48	42	47	30	44	50	43	45	47	44	43	41	41	50	44	41	42	44	43	1,309	MZN 3,036,487	
Ruta2 trip	12m3	19	24	24	21	18	20	18	22	21	19	26	20	23	25	23	26	22	22	22	20	21	21	22	26	24	20	25	22	20	658		
Ruta3 trip	12m3	19	23	21	23	19	20	18	26	23	20	22	22	24	25	21	24	21	23	25	22	22	22	20	19	24	20	21	17	22	23	651	
Ruta1 trip	6m3	4	6	5	5	5	3	5	3	5	4	4	5	4	4	5	5	3	5	5	4	4	5	6	5	5	5	5	6	7	8	143	
container 6m3	6m3	24	37	34	31	34	19	30	18	39	30	27	31	24	27	28	33	37	20	34	33	32	28	30	36	30	30	32	28	37	41	914	MZN 1,060,103
penalização		0	3	0	4	4	5	6	6	3	4	4	4	0	0	3	0	0	0	0	0	3	2	0	0	0	7	4	0	0	4	66	(MZN 330,000)
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Montly Report CA																																MZN 3,015,610	
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AKT-596 trip	12m3	38	47	46	44	37	39	36	48	44	39	48	42	47	46	45	51	43	44	47	43	41	41	43	41	44	44	41	42	43	46	1,300	MZN 3,015,610
AJW-921 trip	12m3	19	23	22	23	19	19	18	25	23	20	22	20	24	25	22	25	21	21	21	21	22	19	22	20	20	21	17	21	23	646		
container AJE-856 6m3	12m3	19	24	24	21	18	20	18	23	21	19	26	22	23	21	23	26	22	21	22	20	21	22	22	24	20	25	22	23	654			
	6m3	28	38	34	33	34	21	35	21	41	27	21	30	27	27	29	34	35	23	36	36	28	33	27	39	34	35	34	33	42	48	963	MZN 1,116,936
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7/12/2023

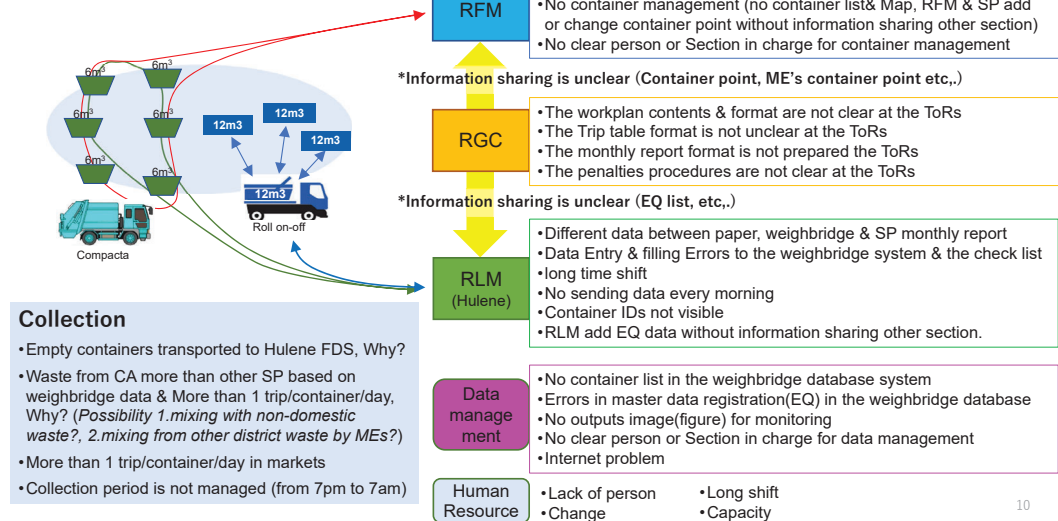
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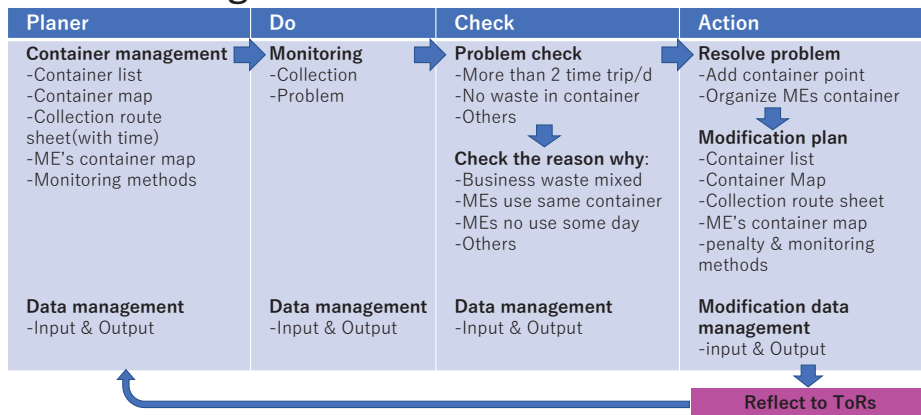




## Problem via Trial Monitoring



## Solution PDCA management



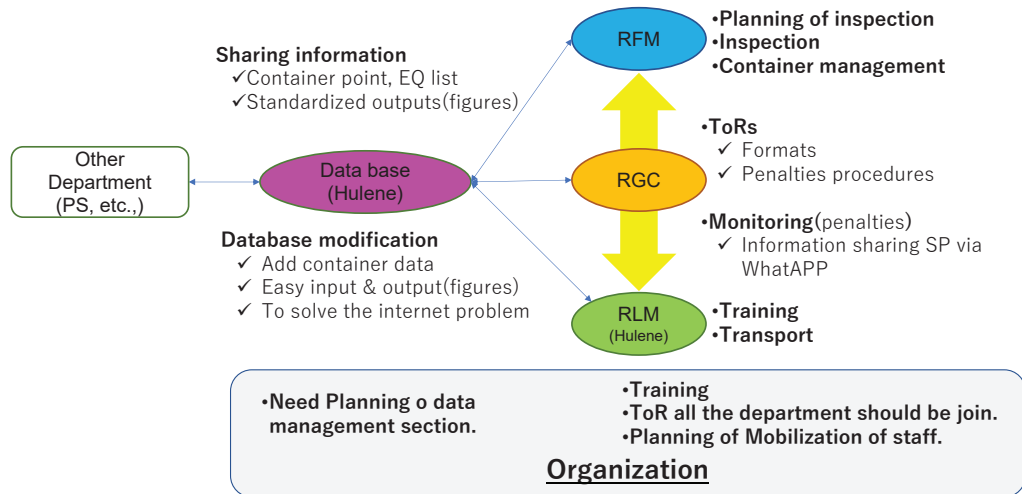
- Standardized
- A person or section in charge for each management

## ToRs for next bidding

Additional contents for ToRs	
Information	Collection plan (Container list, Collection route with time)
Format	Workplan, Trip table, Monthly report
Information sharing	<ul style="list-style-type: none"> <li>SP shall join WhatsApp Group with the MEs &amp; Markets <i>-&gt;for additional collection</i></li> <li>SP shall send the collection route sheets via WhatsApp every morning <i>-&gt;for daily check</i></li> <li>When SP will go to 2nd trip collection, SP shall send information the reason why via WhatsApp <i>-&gt;for avoid 2nd trip no waste &amp; for identify the specific problem to fix it(solution can be by adding more containers or managing the number of trips)</i></li> </ul>
When change the work plan	<ul style="list-style-type: none"> <li>When SP want to add or change container points and type, the request document shall be submitted by SP. Based on that information CMM has a joint action between DSMAS, PS, District, neighborhood (including citizens). And after CMM issue the permission(with new trip sheet), SP can start collection - <i>-&gt;for container management</i>.</li> <li>When SP want to add or change collection EQs, the request document shall be submitted by SP. And after CMM issue the permission, EQ shall be registered at Hulene, and then New EQ can use for collection <i>-&gt;for container management</i>.</li> </ul>
Procedures	The penalties procedures
Others	<ul style="list-style-type: none"> <li>the minimum quantity for 12 m3 containers with penalty for this measure</li> <li>The container ID's should be on both sides with visible paint.</li> </ul>

## Solution

- Standardized
- A person or section in charge for each management(container & data management)



## Output 3 Activities

### Carried out activities

- 1 - Formulate a strategy to minimise waste generation;
- 2 - Plan an appropriate source separation method and rules as required;
- 3 - Plan the appropriate method of separation of hazardous waste from MSW.

### Ongoing activities

- 4 - Implement a source separation PP to verify the feasibility of the source separation;
- 5 - Organize training and workshop for supervision, guidance and application of PP;
- 6 - Promote a recyclable market for informal waste pickers;
- 7 - Establishing linkage with recycling industries in Mozambique.

### Activities for future

- 8 - Analysis of the incentive mechanism to promote recycling.



CONSELHO MUNICIPAL DE  
MAPUTO  
Direcção dos Serviços Municipais  
de Ambiente e Salubridade



Projecto de Capacitação rumo à  
Materialização da Gestão Integrada  
de Resíduos Sólidos no Grande

## Progress of Output 3 and 6 Related Activities

June 2022

## Output 6 Activities

### Carried out activities

- 1 - Review the current status on public awareness and environmental education in Maputo and Mozambique.

### Ongoing activities

- 2- Organize a public awareness and environmental education working group with MTA and MINEDH;
- 3- Prepare a programme and action plan for public awareness and environmental education based on the results of the review;
- 4 - Public awareness and environmental education;
- 5 - Carry out public awareness activities that contribute to the dissemination of the 5Rs concept through collaboration with students, citizens and the local community.

### Activities for future

- 6 - Promote environmental education, including the issue of waste at schools in City of Maputo.

## 1. Recycling-related Actors Networking Meeting (Output 3 and 6)

Recycling-related Actors Networking Meetings were held for 3 times. MTA, MINEDH, recycling companies, NGOs and waste pickers participated in the debate to discuss about the current issues of the recycling sector in Maputo.



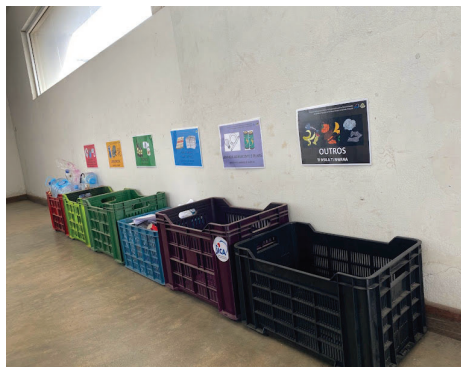
1<sup>st</sup> Meeting, February 2<sup>nd</sup>

2<sup>nd</sup> Meeting, March 28<sup>th</sup>

3<sup>rd</sup> Meeting, May 24<sup>th</sup>

2. Source Separation Pilot Project

(1) Color-coded Baskets & Bins (Output 3)



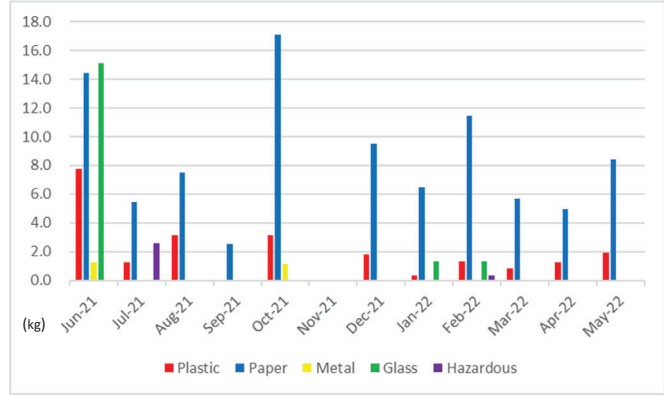
Eco-points of Basket type at 6 points at DSMAS



Recycle Bins at Secretaria, DSMAS

2. Source Separation Pilot Project

(3) Monitoring of Waste Quantity (Output 3)



Total Amount of Separated Waste



Weighing the Separated Waste

2. Source Separation Pilot Project

(2) Color-coded Signboards (Output 3 and 6)



Signboards with 6 colors, illustration and description in Portuguese and Changana

2. Source Separation Pilot Project

(4) Workshops on Waste Segregation (Output 3 e 6)



Table : Workshop Attendance Record

	Date	Participants
1	April 1 <sup>st</sup>	20 people
2	April 14 <sup>th</sup>	22 people
3	April 28 <sup>th</sup>	20 people
4	May 30 <sup>th</sup>	9 people
5	June 6 <sup>th</sup>	11 people

The seminars and the eco-points have contributed to people's awareness of the correct waste disposal.



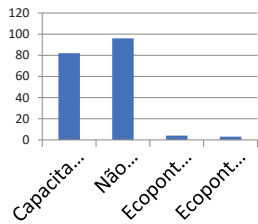
2. Source Separation Pilot Project

(5) Workshops on Waste Segregation (Output 3 e 6)



About 82 DSMAS staff participated in the workshop, divided into Sectors, corresponding to about 47% of staff who benefited from the training of waste segregation. 53% of the staff still need to be trained.

Workshop balance



Trained	82
Non trained	96
Eco-points with problems	4
Eco-points without problems	3

2. Source Separation Pilot Project  
(5) Workshops on Waste Segregation (Output 3 e 6)

[Constraints]

- Mixing of waste in the segregation boxes at the time of disposal;
- Organic disposal in some bins, contaminates the waste;
- Resistance to change the behaviour by some DSMAS staff.

[Challenges]

- Continue with the training of DSMAS staff
- Expand waste segregation PP to other Organic Units of the Municipality and Partners (MTA and Matola Municipality)



Mixed Waste at the Eco-Points

2. Source Separation Pilot Project

(6) Dissemination to Matola (Output 3 e 6)



- ✓ 60 boxes were delivered to Matola Municipality to start the source separation.
- ✓ Preparation of 1 customized Eco-point for waste segregation at Matola.
- ✓ Training for Matola Municipality staff will be conducted.



3. Advertising Material and Technical Support for the Contest Bairro mais Limpo (Output 6)

The Contest **Bairro mais Limpo** is an educational event aiming to encourage the community to be proactive in seeking solutions to the environmental problems affecting its neighbourhoods, and/or surrounding community.

The Contest will have support from JICA Project for dissemination and advertising material, including technical support for Environmental Education.





**CONSELHO MUNICIPAL DE  
MAPUTO**  
Direcção dos Serviços Municipais  
de Ambiente e Salubridade



Projecto de Capacitação rumo à  
Materialização da Gestão Integrada  
de Resíduos Sólidos no Grande

**Obrigado  
Kanimambo  
Thank you**

**June – 2022**

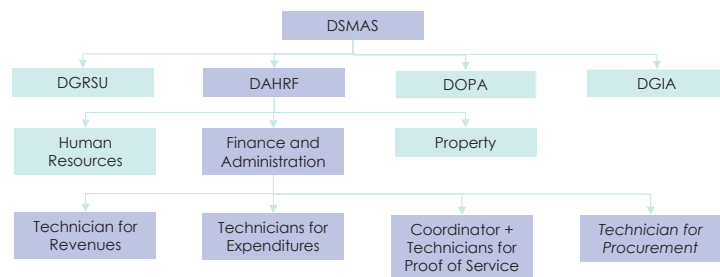
# Financial Performance of the SWM Sector in Maputo City and Main Proposals for Cost Recovery

JICA Project Team  
22th June 2022

## Outline of Presentation

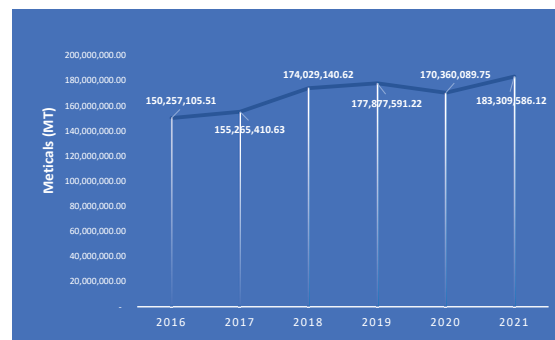
- Structure of Finance Section
- Internal Revenues
- Operating Costs
- Historical Performance and Baseline Forecasts
- Steps towards Cost Recovery

## The Finance Section



- Organizational structure only has 2 levels; Department and Section, then underneath are all technicians. No sub-units to perform specific critical functions.
  - Revenues/Budget Planning
  - Expenditures/Accounting
  - Prova de Serviço
- Units without direct link to, or not physically lodged at, Finance section but are critical in financial management and operations:
  - Procurement
  - Contracts Management
- Financial items on which Finance section has no, or limited, control and monitoring over:
  - Capital investments
  - Fuel\*

## Internal Revenues



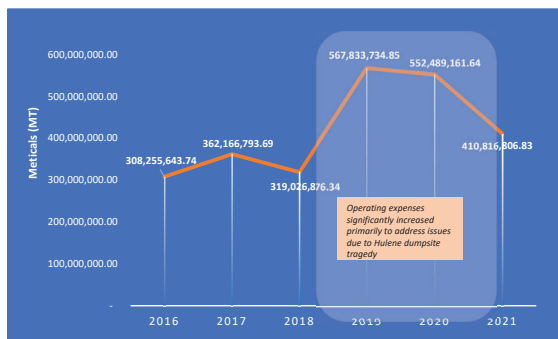
- Average achievement versus targets: 70%. **However...**
- Average 6-year growth: 3.37% (CAGR)
- Collection of cleaning fee through the EDM continues to be the most effective and efficient revenue collection system

Internal Revenue Sources of the SWM Sector and average contributions to total (in %):

Cleaning tax collected by the EDM	92%
Cleaning tax from non-domestic waste generators acknowledged under PdS	4%
Tipping fee at Hulene dumpsite	1%
Fines and penalties	<1%
Contracts for CMM waste collection	1.5%
Special removals	<1%
Licence fees for operating as private service provider in waste collection and transport	<1%



## Operating Costs



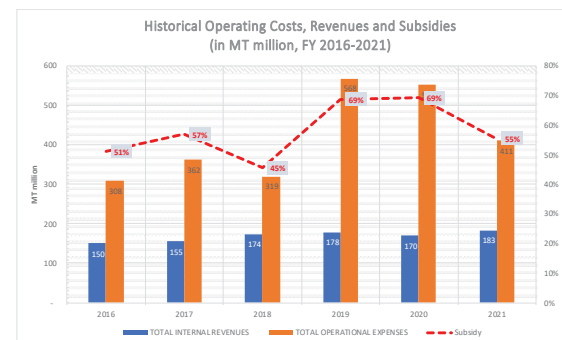
- Mid-year adjustments have always been necessary, usually compromising other items needed to maintain and repair assets
- Average 4-year growth (excluding 2019, 2022): 10% (CAGR)
- For past-year back payments, DSMAS compromises current FY's budget instead of utilizing provision for 1.6.2.0.0 Retroactive Payments for g/s in the budget

Operating cost items in the SWM Sector and average share in total (in %):

Salaries and remunerations	7%
Other Personnel Expenses	<1%
Goods	3%
Services	90%
Other Services	99% of Services
Exercícios Findos	<1%
Other Operating Costs	<1%

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## Historical Financial Performance

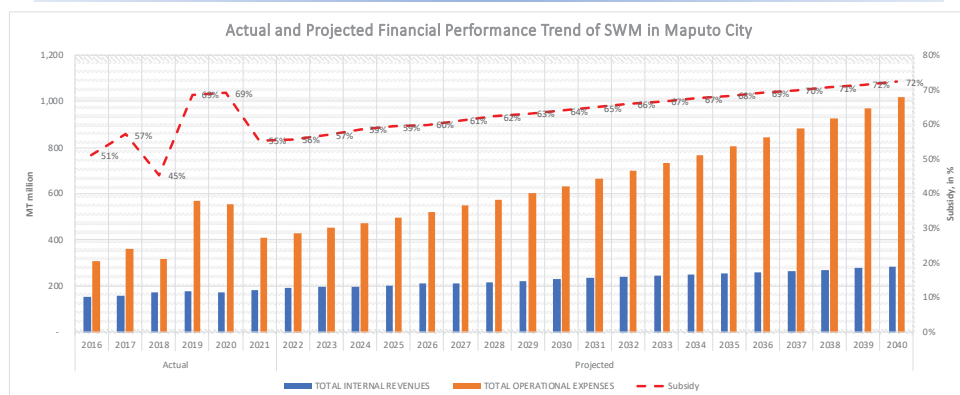


- Budget adjustments and reinforcements are necessary in mid-term for unhampered daily operations
- Operating expenses continue to significantly exceed revenues
- Average 6-year subsidy: 58%
- Sector is heavily subsidized

- Survey among businesses in Maputo identified SWM as one of the **top 3** biggest problems in the City
  - Public transport
  - Solid waste management
  - Flooding/drainage issues

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## Baseline Forecasts



- Without intervention in revenue enhancement and cost-mangement that are duly supported by strong legislation or policy, the SWM sector will continue to be heavily subsidized over the years, exceeding 70% in 2040
- Scenario will be much worse as the sector plans to invest in capital-intensive technology over time

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## Steps Towards Cost Recovery

### Context

- Phase 1 identified that the **major** impediments in financial operations in SWM in Maputo City that needed to be addressed were:
  - Data with little credibility
  - Confusing roles and responsibilities, as well as lack of internal communications and linkages
  - Absence of shareable templates that can be easily replicated and used
  - Budget planning that had limited consultation with people in operations
- M/P recommendations to sustain improvements in financial operations done in Phase 1
  - Database management --- including regular updating of database system to make it responsive to needs of the sector, and correcting classification of non-domestic waste generators
  - Financial operations manual was devised --- including definition of roles and responsibilities, and other institutional adjustments
  - Imposition of tipping fee on **ALL users** of the disposal site to promote transparency and encourage responsibility among waste transport and collections contractors
  - Domestic and non-domestic cleaning fees based on an established relationship among waste generation, electricity consumption, and total cost of SWM
  - Non-domestic cleaning fee (balance) collection through PSPs, instead of PdS
  - Many others

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# Steps Towards Cost Recovery

## Additional Context

- 100% cost recovery is ideal but may not be practicable --- partial cost recovery is targeted
  - Target (%) is subject to internal discussions and CMM Finance
  - Need for better information sharing from EDM
  - Need for significant improvement in PdS database
- 
- Focus on 2 financial sustainability (revenue enhancement) strategies for JCC:
    - Cleaning fees collected by EDM
    - Cleaning fee balance of non-domestic waste generators recognized under PdS

Current cleaning fees collected by EDM

Consumption	Domestic		Non-Domestic	
	kwh	MT	kwh	MT
Low	Up to 200	45	Up to 200	80
Medium	201-500	75	201-500	160
High	500 ~	110	500 ~	250

As much as it is unrelated to SWM cost and waste generation, the present fee structure is socially unjust.

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# Steps Towards Cost Recovery

**Premise:** Preliminary survey results show a statistically significant positive correlation between waste generation and electricity consumption. Electricity consumption is also one of the factors influencing WTP for waste management fee.

- Proposed Cleaning Fee: unit cost based on total cost of SWM, total waste generation, and total electricity consumption per consumer type
  - Domestic: MT/kwh 0.67
  - Non-Domestic: MT/kwh 0.96

This assumes 100% recovery of Goods and Services, Transfers and Exercicios Findos

Illustration for a typical household with pre-paid budget of MT100:

	@50% MT/kwh0.34	@60% MT/kwh0.40	@80% MT/kwh0.54	@ Full Cost MT/kwh0.67
CREDELEC budget per month (MT)	100	100	100	100
Electricity to purchase (@MT5.00/kwh)	20	20	20	20
Cleaning fee	7	8	11	13
% of CREDELEC	7%	8%	11%	13%
Net electricity purchased	19	18	18	17
% of Ave. HH Income	0.1%	0.1%	0.2%	0.2%

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# Steps Towards Cost Recovery

Illustration for a typical small business with pre-paid budget of MT1,500:

	@50% MT/kwh0.48	@60% MT/kwh0.58	@80% MT/kwh0.77	@ Full Cost MT/kwh0.96
CREDELEC budget per month (MT)	1,500	1,500	1,500	1,500
Electricity to purchase (@MT3.11/kwh)	482	482	482	482
Cleaning fee	233	279	372	465
% of CREDELEC	16%	19%	25%	31%
Net electricity purchased	436	426	408	389

Assuming 2021 operations, subsidy can potentially go down:

- @50% MT/kwh: by 5%
- @60% MT/kwh: by 14%
- @80% MT/kwh: by 32%
- @100% MT/kwh: by 51%

To 'virtually' cushion impact of cleaning fee on electricity bill on businesses, partial imposition of full cost fee is necessary, but continue to adopt the fixed fee per category already legislated.

Current fixed cleaning fee collected from non-domestic waste generators

Category	Waste Generation per day	Corresponding Monthly Cleaning Tax
A	Up to 700 kg or 2000 liters	MT 5200
B	Up to 350 kg or 1000 liters	MT 2600
C	Up to 200 kg or 500 liters	MT 1300
D	Up to 100 kg or 250 liters	MT 650
E	Up to 25 kg or 50 liters	MT 325

Recorded/"collected" under PdS

# Steps Towards Cost Recovery

- Issues on the fixed SWM fees imposed on non-domestic waste generators per category:
  - Low recognition/awareness from business sector
  - No strong policy on non-payment
  - Fixed rates are perceived high by about 40% of respondents from recent survey
  - There is dissatisfaction in the manner of payment
  - Low collection efficiency rate --- 18%
- Strategy
  - Stronger efforts in public information dissemination
  - Revise policy on fines and penalties
  - Lower fixed rates BUT improve/expand revenue base
  - Utilize a simpler payment system: based on survey – through annual business registration

This requires strong collaboration among CMM Business Registration/Revenue Sections, DSMAS, and also EDM which is a good source of information particularly on its commercial clients

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Thank you

### AGENDA of the 5th Joint Coordination Committee Meeting

- Date: 7 December 2022 (Wednesday)
- Time: 13:00 to 16:00
- Venue: CMM Training Center
- Agenda:

Time	Agenda	Presenter/in-charge
12:30-13:00	<i>Registration/Preparation</i>	DSMAS/JET
13:00-13:10 (10 min)	Introduction of participants	Mr. Simão Mutereda Chief of Section, DSMAS
13:10-13:20 (10 min)	Opening remarks by CMM	Mr. Silva Magaia Councilor, CMM
13:20-13:30 (10 min)	Opening remarks by JICA	Mr. Kobayashi Deputy chief representative of JICA Mozambique office
13:30-13:35 (5 min)	Introduction on major achievement and way forwards of the Project	Mr. Sergio Director of DSMAS
13:35-13:50 (15 min)	Monitoring of Action Plan and Master Plan (Output 1)	Mr. Chilaule RIA, DSMAS
13:50-14:05 (15 min)	Draft plan for improvement of waste collection and transportation (Output 2)	Mr. Almajane Head of Department, DSMAS
14:05-14:20 (15 min)	Guideline on operation and management of sanitary landfill (Output 4)	Mr. Hosono Chief Advisor, JET
14:20-14:40	<i>Break</i>	
14:40-14:55 (15 min)	Strategy on improving financial sustainability of solid waste management sector (Output 5)	Mr. Anselmo Head of Department, DSMAS
14:55-15:10 (15 min)	Proposal on DSMAS organizational, human resources and institutional development (Output 5)	Mr. Martins Chief of Section, DSMAS
15:10-15:20 (10 min)	Progress of public awareness and environmental education activities (Output 6)	Ms. Nilza Zandamela Head of Department, DSMAS
15:20-15:50 (30 min)	Overall discussion	Mr. Simão Mutereda Chief of Section, DSMAS
15:50-16:00 (10 min)	Closing remarks by CMM	Mr. Silva Magaia, Councilor, CMM

- End of document -



Maputo Municipal Council  
Municipal Directorate for Environment and Solid Waste Management

“Master Plan for Urban Solid Waste Management (MPUSWM)”  
Planning and Monitoring

Prepared by: Raúl Chilaúle, Technician at the Municipal Directorate of Environment and Solid Waste Management

Maputo, December 2022



MUNICÍPIO DE MAPUTO

PRESENTATION CONTENTS

1. Objective of the presentation;
2. Legal Framework on planning and Monitoring of SWM Activities;
3. Master Plan Monitoring:
  - 3.1. Identifying the Monitoring Indicators
  - 3.2. Definition of the date of the monitoring and assign the team;
4. Monitoring of the Action Plan for Municipal Solid Waste Management in the Municipality of Maputo from January to December 2022
  - 4.1. Verify the progress of the actions and complete the Monitoring Sheet;

01



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PRESENTATION CONTENTS

5. Results of the Monitoring of the Action Plan for the Management of Urban Solid Waste in the Municipality of Maputo from January to December 2022.

- a) PA 1: General Provisions
- b) PA 2: Organizational Structure
- c) PA 3: Collection and Transport
- d) PA 4: Treatment and Disposal
- e) PA 5: 5Rs
- f) PA 6: Civic Education
- g) PA 7: Financial management

01



MUNICÍPIO DE MAPUTO

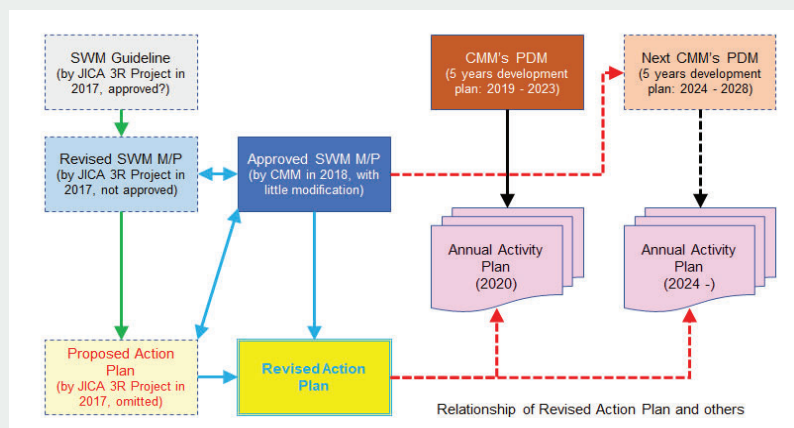
1. Background

The Municipality of Maputo, through its Strategic Plan, has as one of its priorities the improvement of Urban Solid Waste Management (USWM) and to make this activity sustainable in order to ensure sanitation conditions with reduction of negative environmental impacts. Thus, this presentation is intended to:

- ✓ Inform about the current stage of the implementation of the Urban Solid Waste Management Master Plan in the Municipality of Maputo through DMAS;
- ✓ Present the results of the monitoring of the Action Plan for USW Management in the Municipality of Maputo for the period of January to December 2022.

02

## 2. Legal Framework for Planning and Monitoring MSWM Activities



03

## 3. USW Management Activities Planning Stages

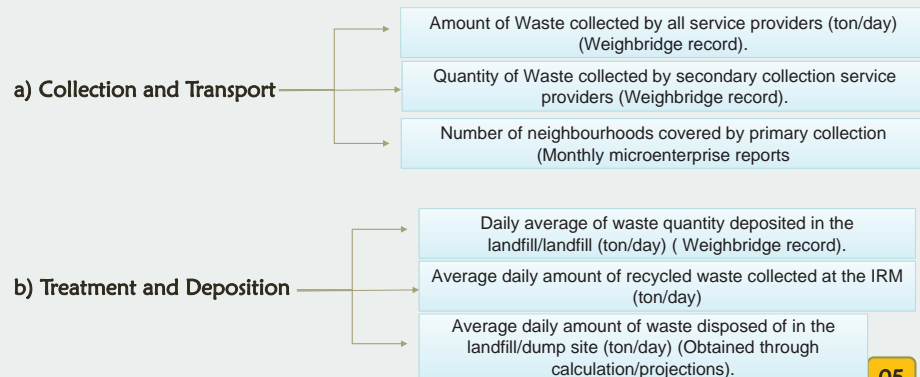
### 3.1 Identification of Monitoring Indicators

Using the Matrix of Activities aimed at achieving the strategic objectives of the MP and PDM, the monitoring indicators are identified, and the following steps are taken: "definition of each indicator," "measurement methodology," "responsible organization," and "its frequency."

04

## 4. Master Plan monitoring procedure:

### 3.1. Identifying Indicators for Monitoring



05

## 4. Master Plan monitoring procedure:

### 3.1. Identifying Indicators for Monitoring



07





#### 4. Master Plan monitoring procedure:

##### 3.1. Identifying indicators for Monitoring.

##### f) Financial Management:

Target Rate - Cost Coverage for SWM.

Target coverage rate for proof-of-service revenue.

Target Coverage Rate for Cleaning Fee

##### 3.2. Definition of the date of the monitoring and members of the team that will do the monitoring.

✓The date of the monitoring should be determined according to the Monitoring Schedule in the Action Plan, that is, there should always be a well-defined Action Plan before the Monitoring process begins.

✓To appoint the member of the monitoring team, the department/section in charge, should always consult the supervisor.

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#### 4.3. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

##### 4.1. Verifying the progress of the actions and filling out the monitoring sheet;

i. Verificar o progresso de cada acção, comparando-a com o previsto no cronograma

ii. Comparar a “Situação Planeada” e a “Situação Real” e em seguida seleccionar o menu nas caixas de monitoria designadas

Acções Levadas a Cabo de 2020 a 2024	2022											
	IV			I			II			III		
PA1-2: Monitoria do Progresso do P/A (2020 a 2024)	9	8	7	6	5	4	3	2	1	12	11	10
(1) Criação da Equipa de Monitoria												
(2) Confirmação do Cronograma de Monitoria Semestral (Janeiro e Setembro)												
(3) Implementação da Monitoria Semestral												
(4) Reflectir no Plano Anual de Actividades do CSDA												

Situação Planeada das Actividades no Plano de Acção	Situação Actual	Resultado da Monitoria
<input type="checkbox"/> Não iniciada ainda <input type="checkbox"/> Em curso (30%) <input type="checkbox"/> Em curso (50%) <input type="checkbox"/> Em curso (70%) <input type="checkbox"/> Realizada	<input type="checkbox"/> Não iniciada ainda <input type="checkbox"/> Em curso (30%) <input type="checkbox"/> Em curso (50%) <input type="checkbox"/> Em curso (70%) <input type="checkbox"/> Realizada	<input type="checkbox"/> Consideravelmente atrasada <input type="checkbox"/> Atrasada <input type="checkbox"/> Realizada a tempo <input type="checkbox"/> Realizada atempadamente

09



#### 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

##### a) PA 1: General Provisions

##### b) PA1-1: Monitoring of the Progress of the MP approved in 2018

Attempts were made to establish a monitoring team and design a schedule for the monitoring to take place in 2021, however this was not possible due to the possibility of the construction of the new landfill in Katembe. The MP monitoring is scheduled for the second half of 2022, as part of the Output 1 activities.

##### PA1-2: (MP Progress Monitoring (2020 to 2024)

Due to the delay in preparing the AP monitoring guidelines, the monitoring was also delayed. However, with JET assisting by creating the guidelines, the monitoring has been started since the beginning of August and its result is expected to be reflected in the Annual Activity Plan by the end of September by DSMAS.

##### PA1-3: The mid-term review has not yet been implemented.

It was expected to implement the mid-term review of the MP in 2021, but due to CMM intention to build the landfill in Katembe instead of Mathleleme, in 2021, would be supported by the WB, the timing of the review was changed in 2022.

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#### 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

##### a) PA 1: General Provisions

##### PA 1-4: Implementation of Waste Quantity and Quality Survey

Budgeted for the implementation of the MSW Quantity and Quality survey for the 2023 fiscal year. Note that this activity will be carried out with the funds from the Municipality through the item for consultancies.

##### PA 1-5: Minor Updates to the MP approved in 2018 (MP Updated for 2023)

This action will be conducted together with the mid-term review of the MP. DSMAS team will be responsible for conducting the mid-term review of the M/P.

##### PA 1-6: Cleaning Ordinance Review

The Consultant has started its work since mid-July and needs about 6 months to complete. However, the goal of submitting a new proposed Ordinance is provisionally set until the end of February 2023 for approval by the Municipal Assembly.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### b) PA 2. Revision of the Organic Structure of DSMAS

#### PA 2-1: Creation of DSMAS

This action has already been completed.

#### PA 2-2: Review of the new organizational structure of DSMAS

This action has already been completed.

#### PA 2-3: Capacity building of DSMAS staff

There is an annual training plan for CMM staff, hence DMAS informs its training needs to PDBRH, although the request is not always answered satisfactorily allegedly due to financial constraints. However, some online training opportunities have been provided by JICA for some DMAS staff.

#### PA2-4: Reflection on the Inter-municipal Committee for Landfill Operation.

No action is implemented because it is still under discussion which landfill will be used for the final disposal of USW (KaTembe or Mathlemele). It should be pointed out that since 2019, there has been no discussion between the two Cities on the issue. After the decision is made, further discussions will be held to determine whether or not this action will continue.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### c) PA 3: Waste Collection and Transportation (MP Chapter 6.3)

#### PA 3-1: Reflexion on Increasing the Transport Distance to the New Mathlemele Landfill and/or Katembe in Urban Collection

The implementation of the time and motion study is planned in the annual plan of activities (Plan and Budget 2022). On the other hand, Output 2 team and JET will conduct a survey on Google map or similar tools.

#### PA 3-2: Expansion of Door-to-Door Collection in the Urban Area

The implementation of the door-to-door collection study is planned in the annual activity plan 2022. On the other hand the output 2 and JET team will verify the effectiveness of door-to-door collection, which is not highly prioritized.

#### PA 3-3: Reflection on Increasing the Transport Distance to the New Mathlemele and/or Katembe Landfill for Secondary Collection in the Suburban Area

All activities are within the initially defined schedule, although they have not yet started because they depend on the construction of the landfill, except for the Time and Motion study (1) which depends on budget programming.

#### PA 3-4: Transport of Waste from Katembe

The management of solid urban waste in Katembe will be discussed in the studies planned by the World Bank for the construction of the new landfill with technical input from JET.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022

### PA 3-5: Primary collection in Katembe

The activity was mostly carried out as planned. It should be noted that there was a decentralization process for contracting Primary Collection services (Micro Companies) for all municipal districts, which caused delays in the preparation of the tender.

### PA 3-6: Elimination of Informal Dump sites

Three trucks were procured, two (02) of the Roll on Roll off type and one (01) compactor to carry out the work of eliminating informal dumps sites and respond to emergency cases in coordination with the Municipal Districts.

### AP 3-7: Improvement of Special Removal by DSMAS

specific implementation plan for the improvement of special collection is not prepared. However, DMAS has procured three Roll on roll off trucks for interventions in case of failure or lack of collection.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### d) PA 4: Waste Treatment and Disposal (P/D Chapter 6.4)

#### PA 4-1: Construction and Operationalization of the New Landfill in Mathlemele

Since the construction plan for the new landfill in Katembe is underway, the coordination has been provisionally suspended. However, there is still a possibility for the CMM to use the landfill in Mathlemele due to transportation efficiency.

#### PA 4-2: Construction and Operation of the New Landfill in Katembe

The availability of 60 ha for the construction of the landfill, including the necessary buffer area for the accumulation of waste from Maputo for about 20 years was ensured.

#### PA 4-3: Closure of the Hulene Dump

It was contracted a consulting service for the closure of the hulene dumpsite through PTUM in September 2022.

#### PA 4-4: Introduction of SWM Intermediate Treatment System

No action related to the introduction of an intermediate treatment system has been carried out. Waste reduction methods will be discussed during the PTUM Study or the mid-term review of the MP.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### e) ) PA 5: Promoting the 5Rs

#### PA 5-1: Enhancing the 5Rs Policy Framework

The 5Rs forum has been organized four times so far. In parallel, intermittent and irregular meetings were held with MTA in order to discuss issues related to the 5Rs policy.

#### PA 5-2: Promoting 5Rs In The Urban Area

DMAS is preparing a pilot project for segregated collection of recyclables in public buildings, and with JET support is also looking for the recycler to handle the collected recyclables.

#### PA 5-3: Expansion of 5Rs Stations in the Suburban Area

The study of the need for 5Rs stations in the suburban area is still ongoing. This action will be done under PTUM, that also proposes the creation of 5Rs stations of the same type.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### e) PA 5: Promoting the 5Rs

#### PA 5-4: Introduction of Separate Collection in the Suburban Area

DMAS with support from Italian Cooperation is preparing to implement segregated collection in Chamanculo C, including community composting from the collected organic waste...

#### PA 5-5: Promotion of Home Composting

DMAS is planning to implement the segregated collection study in Chamanculo C, including community composting. Note that composting is one of the alternatives to reduce the volume of waste to be disposed in the landfill.

20



## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### f) PA 6: Civic (Environmental) Education

#### PA 6-1: Introduction of the 5Rs Principle in Educational Institutions

It has been introduced in 05 schools, including Primary and Secondary schools. The Instruction Manual is being updated considering the 5Rs policy with support from JET. It should be noted that due to the outbreak of COVID-19, this activity is being carried out following the health protocol.

#### PA 6-2: Public Awareness Campaigns at Critical Points of USW Generation

All actions related to the public awareness campaign at critical USW generation points have been implemented in compliance with the sanitary protocol imposed by the COVID-19 situation.

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## 5. Results of the Monitoring of the Action Plan for the Management of Municipal Solid Waste in the Municipality of Maputo from January to December 2022.

### g) PA 7: Financial Management

#### AP7-1: Estimated Major Expenses for New Waste Management Systems

The studies on the major expenditures in municipal solid waste management was completed with the support from JET, which also includes the construction situation of the new landfills in Katembe, through PTUM and Matlhembele.

#### AP 7-2: A Mechanism for Improving the Revenue Collection

A financial sustainability strategy has been developed for May 2022 consisting of correcting the operation of the revenue collection system through EDM and Proof of Service with support from JET.

#### AP 7-3: Study for Changing the Cleaning Fee and its Collection System

The study has already been completed and the financial strategy for SWM has been prepared, presented to the technicians of the Revenue Department of the Municipal Finance Directorate and we await for an opportunity to present at the CMM session.

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**THE END**

**THANK YOU FOR THE ATTENTION**

## OUTPUT 2

**[Activity 2-1]** Organize trainings, seminars and workshops for CMM officers on the supervision of Waste Collection Service Providers (WCSP).

**[Activity 2-2]** Study the current situation of the WCSPs and their contracts.

**[Activity 2-3]** Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area

**[Activity 2-4]** Examine the revision of contracts with the WCSPs for improving waste collection service.

**[Activity 2-5]** Study monitoring and control system of waste collection services using ICTs (Information and Communication Technologies).

## Develop a draft plan to optimize the waste collection and transportation service in the entire CMM area [Activity 2-3]

### I. Current situation

1. Monitoring trial.
2. ME Survey

### II. Draft plan to optimize the waste collection and transportation service

#### 1. Capacity development & waste collection and transportation service information management

- i. Management of container information
- ii. Management of collection route
- iii. Data management
- iv. Information sharing management

#### 2. Waste collection and transportation service monitoring management

- i. Weighbridge data management
- ii. Monitoring of waste collection and transportation services for MEs and large WCSP based on ICTs (MOPA)-Activity [2-5]
- iii. Identifying problems

#### 3. Measures for waste reduction

- i. Non-domestic waste management
- ii. Management of market waste

#### 4. Future collection plan for sub-urban and urban area

#### 5. Examine the revision of contracts with the WCSPs for improving waste collection service-Activity [2-4]

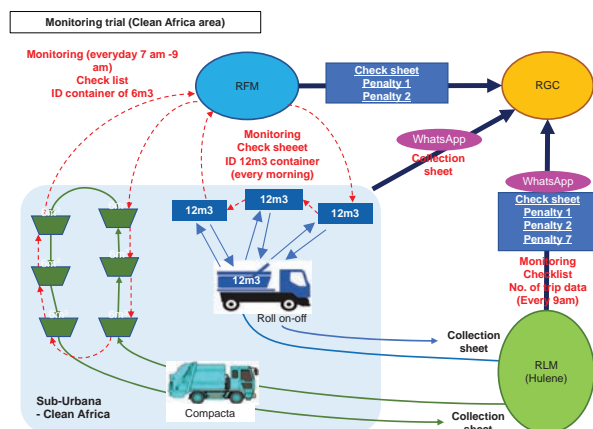
### III. Waste transfer methods

1

2

### I. Current situation

## 1. Monitoring trial



### Problems

1. Container and collection route management
2. Waste amount management
3. Waste flow management
4. Waste collection management
5. ToRs of the bidding and WCSPs contracts
6. Supervision management
7. Collection of empty containers
8. Unreliable information on secondary collection
9. More than two collections per day per container
10. Weighbridge management

3

### I. Current situation

## 2. Microenterprise (ME) survey

DIS	CONT NAME	CA	MEs	Problem	Business	Market	1 MEs				2 MEs				3 MEs			
12m3	Nhamitulu CETA-Centro de Saude de Xipamanine - Av. Joaquim Chissano	1.8	1	Y	Y		X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Escola Unidade 18 -Rua Gago Coutinho	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Igreja Assembleia-Rua Gago Coutinho	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Rua Gago Coutinho - Igreja Catolica	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu 100-Rua Gago Coutinho	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Entrada da Base Aerea - Av. 19 de Outubro	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Campo Base Aerea - Av. 19 de Outubro	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Mercado Vulcano - Rua Gago Coutinho	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu 10- Esquadra - Rua de Xipamanine	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Rua dos Imoios Ruby/Parque Xipamanine	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Rua do Zimaboe	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu SSI Joaquim Rua Zambete	1.4	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Xibamete 1- Av. De Angola	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Xibamete 2- Av. De Angola	1	0.8				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Colombia - Rua Maria Teixeira Pinto	1.1	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Zanta - Rua Marcelino dos Santos	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Ube-Rua 2376	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Casa-Capa-Campo - Rua 2282	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Terminal da Junta	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Lhangue-Av. Moirémbosé	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Zikava - Rua do Zikava Nr. 2302	1.8	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Rotunda 16 de Junho- Av. OUA	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Coca-cola-Rua lago Maramba	1.2	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Ugo-Av. Trabalho	1.4	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Ntangi-Rua Gago Coutinho	1.4	1				X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Mercado Xipamanine - Rua Zikava 1	1.7					X	X	X	X	X	X	X	X	X	X	X	X
12m3	Nhamitulu Mercado Xipamanine - Rua Zikava 2	1.6					X	X	X	X	X	X	X	X	X	X	X	X

4

## II. Draft plan to optimize the waste collection and transportation service

### Adequate management and monitoring of waste collection and transportation contracts

#### 1.Capacity development & waste collection and transportation service information management

i. Management of container information

ii. Management of collection route

iii. Data management

vi. Information sharing

#### 2. Waste collection and transportation service monitoring management

i. Weighbridge data

ii. Informations from ME and WCSPs

iii. Identifying problems

#### 3. Measures for waste reduction

i. Non-domestic waste

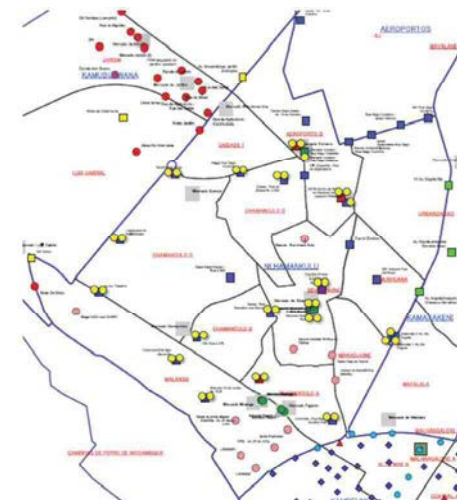
ii. Waste of markets

5

## II. Draft plan to optimize the waste collection and transportation service

### 1. Capacity development & waste collection and transportation service information management

#### i. Management of container information



6

## II. Draft plan to optimize the waste collection and transportation service

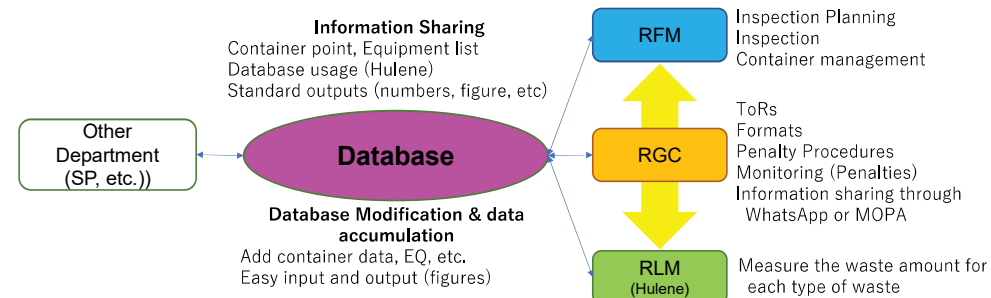
### ii. Management of collection route

Row	Free	DS	CONT NAME (12x3)	Merch	Problem	Business	S	T	Q	F	S	T	Q	F	S	T	Q	F	1 Mes	2 Mes	CA
1	12x3	12x3	Impeço Assentado-Rua Gago Coutinho				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
2	12x3	12x3	Escola Unidade 18 -Rua Gago Coutinho				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
3	12x3	12x3	Rua Gago Coutinho - Igreja Católica				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
4	12x3	12x3	067-Rua Gago Coutinho				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
5	12x3	12x3	Entrada da Base Aérea - Av. 19 de Outubro				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
6	12x3	12x3	Campo Base Aérea - Av. 19 de Outubro				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
7	12x3	12x3	16- Esquadra - Rua de Xipamanine				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
8	12x3	12x3	Rua do Zimbábue				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3
9	12x3	12x3	Slt Joaquim Rua Zambéze				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4
10	12x3	12x3	Cape-Cape-Campo - Rua 2.282				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5
11	12x3	12x3	CETA 1-Centro de Saude de Xipamanine - Av. Joaquim Chissano				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
12	12x3	12x3	CETA 2-Centro de Saude de Xipamanine - Av. Joaquim Chissano				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
13	12x3	12x3	CETA 3-Centro de Saude de Xipamanine - Av. Joaquim Chissano				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
14	12x3	12x3	Rua dos Irmãos Ruby/Parque Xipamanine				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5
15	12x3	12x3	Xibamato 1- Av. De Angola				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	12x3	12x3	Xibamato 2- Av. De Angola				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	12x3	12x3	Xibamato 3- Av. De Angola				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	12x3	12x3	Colômbia - Rua Major Teófilo Pinto				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2
19	12x3	12x3	NEW for Chamanculo A				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3
20	12x3	12x3	Zanza - Rua Marcelino dos Santos				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3
21	12x3	12x3	Ulla- Rua 2.275				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4
22	12x3	12x3	Uhangwencho, MoMbeque				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5
23	12x3	12x3	Zizana - Rua do Zizana N°2302				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5

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## II. Draft plan to optimize the waste collection and transportation service

### iii. Data management



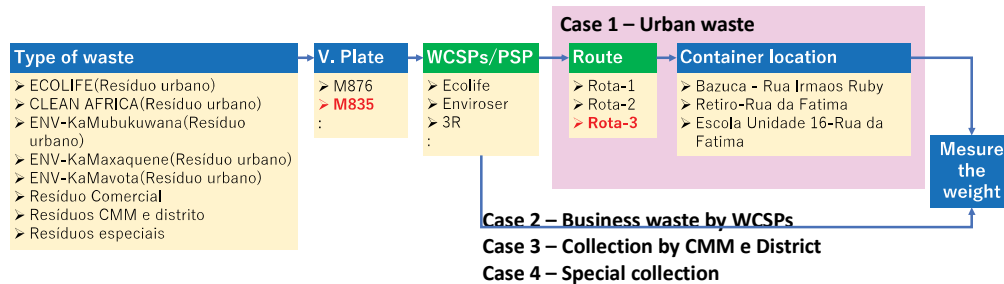
8



## II. Draft plan to optimize the waste collection and transportation service

### 2. Waste collection and transportation service monitoring management

#### i. Weighbridge data management



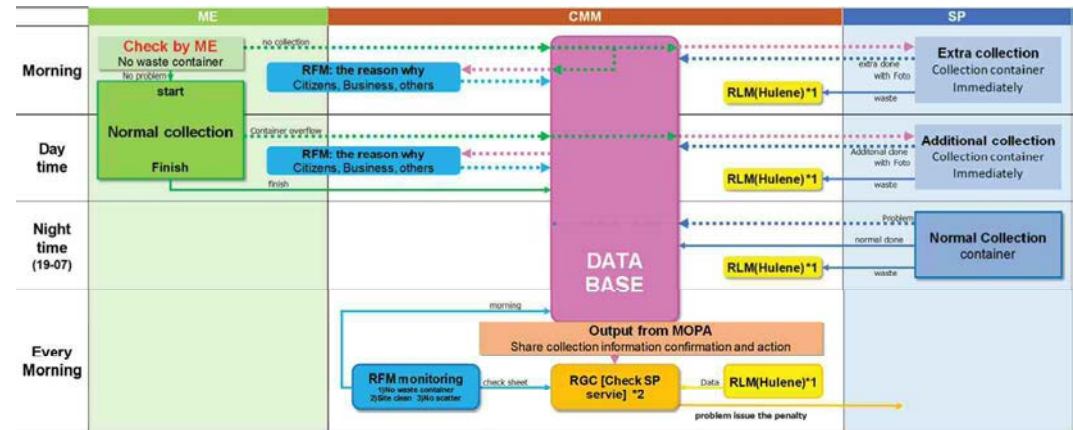
Report (Daily, weekly, Monthly)

Information on the type of waste (\*amount, \*number of trips)

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## II. Draft plan to optimize the waste collection and transportation service

### ii. Information from ME and WCSPPS



Monitoring of waste collection and transportation services based on ICTs-Activity [2-5]

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## II. Draft plan to optimize the waste collection and transportation service

Daily Repo DATE: 2022,XX,XX, (Tuesday) 9:00

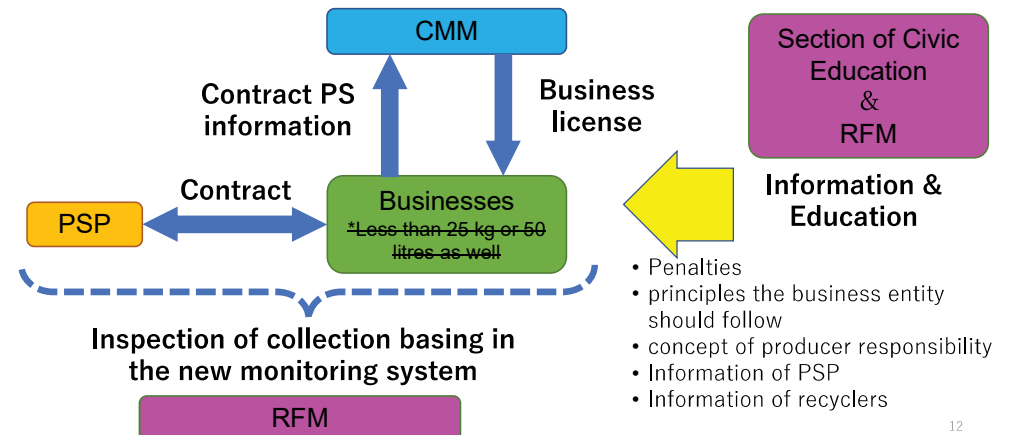
	CONT NAME	Extra(7-8)			additional(8-19)			Normal(19-7)			Extra & Add		Normal 2nd collection plan												
		ME	SP	Fiscal	ME	SP	Fiscal	SP	SP	ME	SP	Normal difference	sum	*1											
		trip	trip	why	trip	trip	why	trip	foto&why	trip	trip	why	week	S	T	Q	Q	F	S						
1	12w3	CETA-Centro de Saude de Xipamanine - Av. Joaquim Chissano	1	1	Citizen	1	1	Business	1	2	2	0	6	1	1	1	1	1	1						
2	12w3	Escola Unidade 18 -Rua Gago Coutinho				1	1	Other	1	1	1	0	3	1	1	0	0	1	0						
3	12w3	Igreja Assembleia-Rua Gago Coutinho				1	0	0	1	0	0	1	3	1	0	1	0	0	1						
4	12w3	Rua Gago Coutinho - Igreja Catolica				2	2	Business	1	2	2	1	3	1	0	1	0	1	0						
5	12w3	007-Rua Gago Coutinho				1	0	0	1	0	0	1	3	1	0	1	0	0	1						
6	12w3	Entrada da Base Aerea - Av. 19 de Outubro				1	0	0	1	0	0	1	2	1	0	0	1	0	0						
7	12w3	Campo Base Aerea - Av. 19 de Outubro				1	0	0	0	0	0	0	4	1	1	0	1	1	0						
8	12w3	Mercado Vulcano -Rua Gago Coutinho				1	0	0	0	1	0	0	6	1	1	1	1	1	1						
9	12w3	10- Esquadra - Rua de Xipamanine				1	0	0	1	0	0	1	3	1	0	1	0	1	0						
10	12w3	Rua dos Irmaos Ruby/Parque Xipamanine	1	1	Business				1	1	1	1	4	1	0	1	1	0	1						
11	12w3	Rua do Zimabwe				1	0	0	1	0	0	1	2	1	0	0	0	1	0						
12	12w3	Sã Joaquin Rua Zambeze				1	0	0	1	0	0	1	4	1	0	1	1	0	1						
13	12w3	Xibamate 1- Av. De Angola				1	0	0	0	0	0	0	5	1	1	0	1	0	1						
14	12w3	Xibamate 2- Av. De Angola				1	0	0	0	0	0	0	5	1	1	0	1	0	1						
15	12w3	Colombis - Rua Major Teixeira Pinto				1	0	0	0	0	0	0	6	1	1	1	1	1	1						
16	12w3	Zanza - Rua Marcelino dos Santos				1	0	0	0	0	0	0	6	1	1	1	1	1	1						
17	12w3	Ufa- Rua 2,276				1	0	0	0	0	0	0	5	1	1	0	1	1	1						
18	12w3	Cape-Cape-Campo - Rua 2,282				1	0	0	0	0	0	0	6	1	1	1	1	1	1						
19	12w3	Terminal da Junta				1	0	0	0	0	0	0	3	1	1	0	0	1	0						
20	12w3	Lhanguene-Av. Moilmbique				1	0	0	0	0	0	0	5	1	1	0	1	0	1						
21	12w3	Zixaxa - Rua do Zixaxa Nr. 2,302				1	0	0	0	0	0	0	6	1	1	1	1	1	1						
22	12w3	Rotunda 16 de Junho- Av. OUA				1	0	0	0	0	0	0	3	1	1	0	0	1	0						
23	12w3	Coca-cola-Rua Iago Maramba				1	0	0	0	0	0	0	3	1	1	0	0	1	0						
24	12w3	Up-Av. Trabalho				1	0	0	1	0	0	1	3	1	0	1	0	1	0						
25	12w3	Naggo-Rua Gago Coutinho				1	0	0	0	0	0	0	4	1	1	0	1	1	0						
26	12w3	Mercado Xipamanine - Rua Zixaxa 1				1	0	0	0	0	0	0	6	1	1	1	1	1	1						
27	12w3	Mercado Xipamanine - Rua Zixaxa 2				1	0	0	0	0	0	0	6	1	1	1	1	1	1						
160	Total		2	2		4	4		27	6	6	0	9	115	27	18	19	14	18	15					
RLM data(from Hulene)			1			4			27		32														

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## II. Draft plan to optimize the waste collection and transportation service

### 3. Measures for waste reduction

#### i.Non-domestic waste management



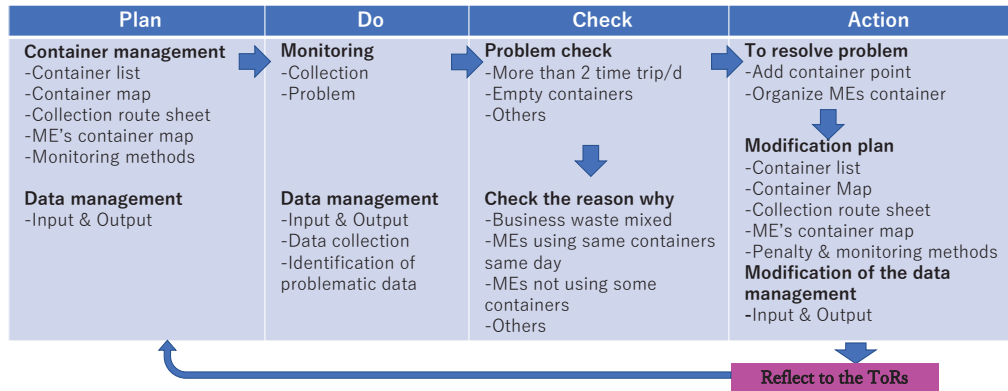
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## II. Draft plan to optimize the waste collection and transportation service

### 4. Future collection plan for sub-urban and urban areas

#### i. Sub-urban area

#### Management by PDCA



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## II. Draft plan to optimize the waste collection and transportation service

#### ii. Urban area

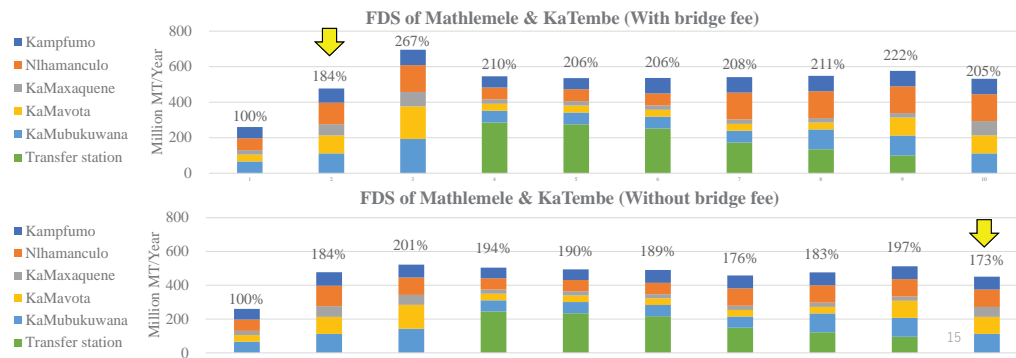
- Measures to non-domestic waste presented above.
- Door-to-door collection in isolated houses - an area should be selected and started as a pilot project.
- Waste collection in Apartments - Own container should be installed inside the yard of apartments to avoid the action of waste pickers.  
Article 11 of resolution 89/AM/2008 of 22 May, mentions this.

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## III. Waste transfer methods

### 1. Operation of both FDS of Mathlemele & KaTembe

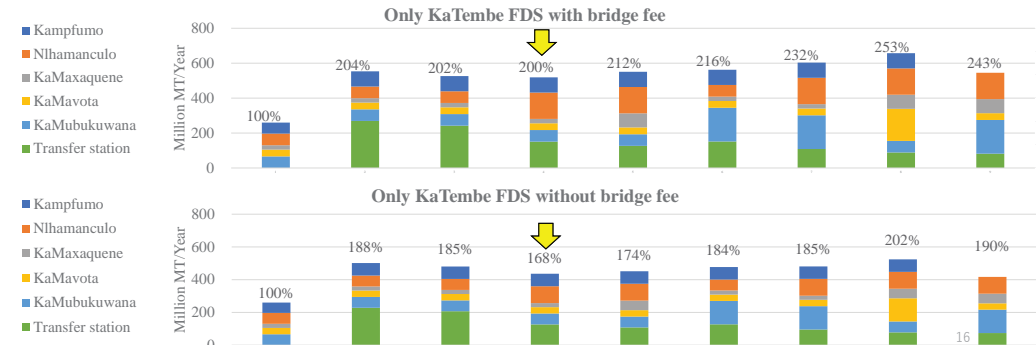
	Actual	DT->Mathlemele	DT->KaTembe	Final Disposal Sites (FDS) of Mathlemele & KaTembe						
Kampfumo	->Hulene	DT->Mat	DT->KaT	TS->Mat	TS->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT
Nihamanculo	->Hulene	DT->Mat	DT->KaT	TS->Mat	TS->KaT	TS->Mat	DT->KaT	DT->KaT	DT->KaT	DT->KaT
KaMasaquene	->Hulene	DT->Mat	DT->KaT	TS->Mat	TS->KaT	TS->Mat	TS->Mat	TS->Mat	TS->Mat	DT->KaT
KaMavota	->Hulene	DT->Mat	DT->KaT	TS->Mat	TS->KaT	TS->Mat	TS->Mat	TS->Mat	DT->Mat	DT->Mat
KaMubukuwana	->Hulene	DT->Mat	DT->KaT	TS->Mat	TS->KaT	TS->Mat	TS->Mat	DT->Mat	DT->Mat	DT->Mat
Transfer station t/d				1,093	1093	928	635	351	138	



## III. Waste transfer methods

### 2. Only KaTembe FDS

	Actual	Only KaTembe FDS								
Kampfumo	->Hulene	TS->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT
Nihamanculo	->Hulene	TS->KaT	TS->KaT	DT->KaT	DT->KaT	TS->KaT	DT->KaT	DT->KaT	DT->KaT	DT->KaT
KaMasaquene	->Hulene	TS->KaT	TS->KaT	TS->KaT	DT->KaT	TS->KaT	TS->KaT	DT->KaT	DT->KaT	DT->KaT
KaMavota	->Hulene	TS->KaT	TS->KaT	TS->KaT	TS->KaT	TS->KaT	TS->KaT	DT->KaT	TS->KaT	TS->KaT
KaMubukuwana	->Hulene	TS->KaT	TS->KaT	TS->KaT	TS->KaT	DT->KaT	DT->KaT	TS->KaT	DT->KaT	DT->KaT
Transfer station t/d		1,093	928	635	497	644	351	284	213	

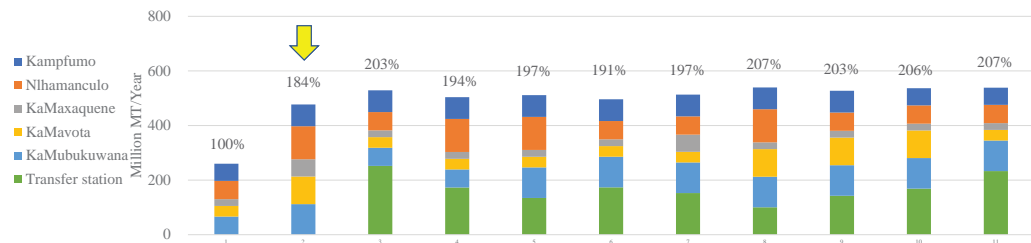


### III. Waste transfer methods

## 3. Only Mathlemele FDS

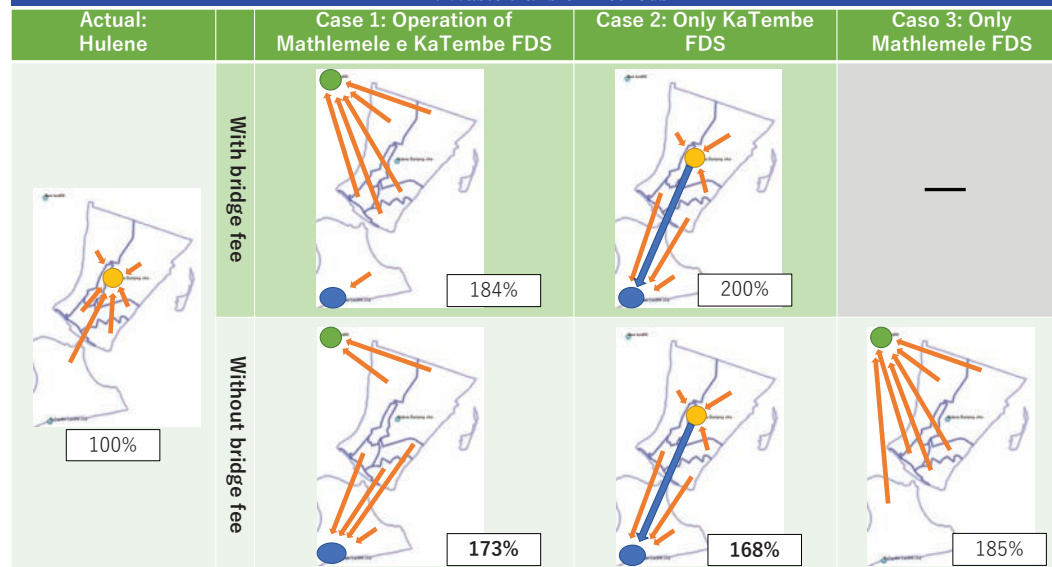
	Actual	DT->Mat	Only Mathlemele FDS									
Kampfumo	->Hulene	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	TS->Mat	TS->Mat	TS->Mat
Nihamanculo	->Hulene	DT->Mat	TS->Mat	DT->Mat	DT->Mat	TS->Mat	DT->Mat	DT->Mat	DT->Mat	TS->Mat	TS->Mat	TS->Mat
KaMaxaquene	->Hulene	DT->Mat	TS->Mat	TS->Mat	TS->Mat	TS->Mat	DT->Mat	TS->Mat	TS->Mat	TS->Mat	TS->Mat	TS->Mat
KaMavota	->Hulene	DT->Mat	TS->Mat	TS->Mat	TS->Mat	TS->Mat	TS->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	TS->Mat
KaMubukwana	->Hulene	DT->Mat	TS->Mat	TS->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat	DT->Mat
Transfer station t/d			928	635	351	644	506	138	431	596	809	

Mathlemele FDS



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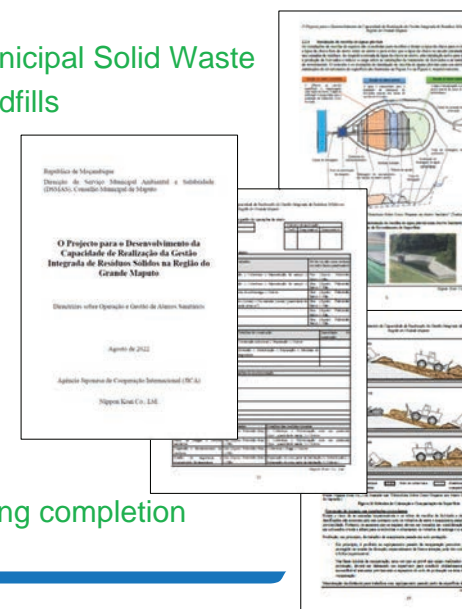
### III. Waste transfer methods



# Introduction of Guideline on Sanitary Landfill Operation and Management

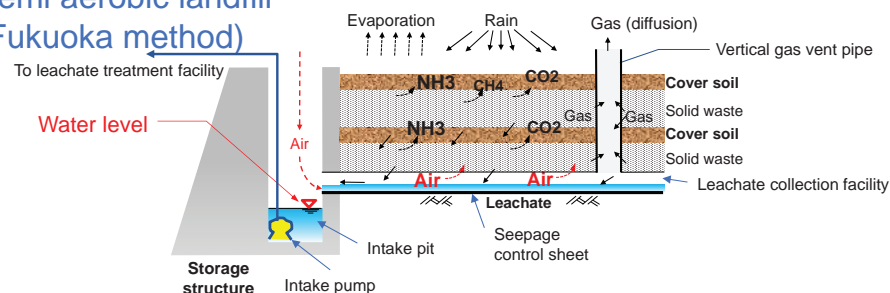
## Table of Contents of the Guideline on Sanitary Landfill Operation & Management

1. Management of Landfill for Municipal Solid Waste
2. Functions and Facilities of Landfills
  1. Landfill Structure
  2. Main Facilities
  3. Administrative Facilities
  4. Related Facilities
3. Management of Landfills
  1. Transport Control Management
  2. Landfill Operation Management
  3. Facility Management
  4. Environmental Management
  5. Safety Management
4. Site management after landfilling completion
5. Management Record Forms

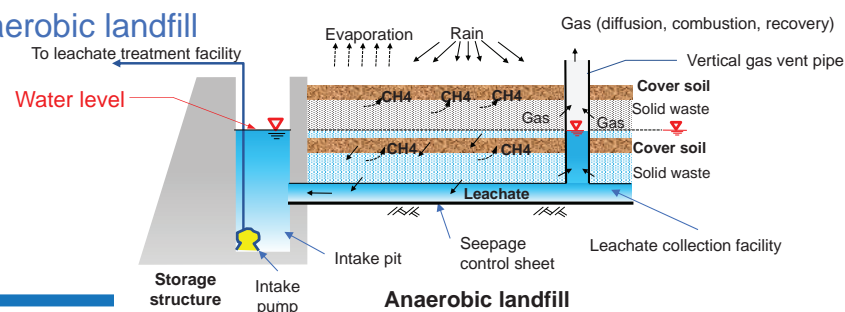


## 1.2 Landfilling Structure

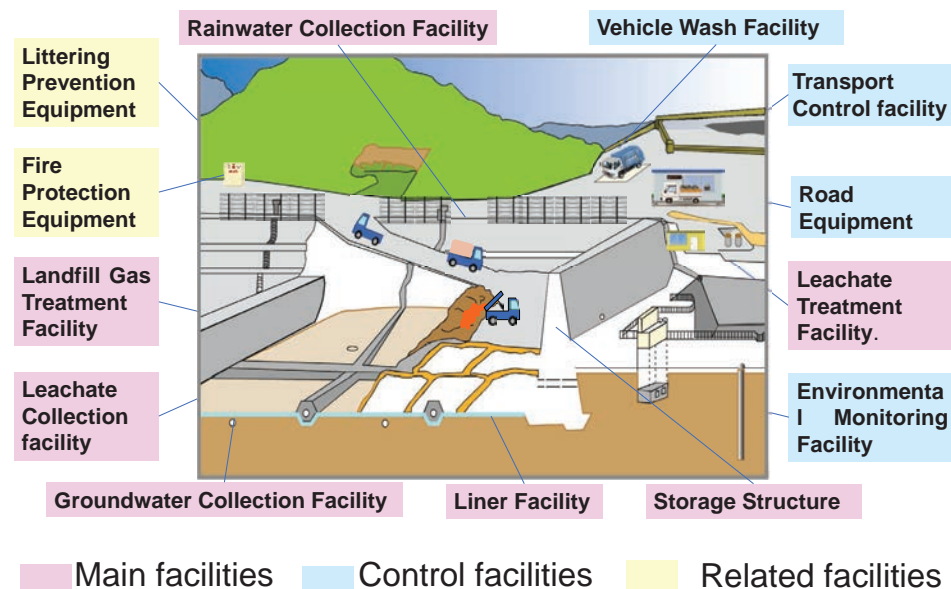
### Semi aerobic landfill (Fukuoka method)



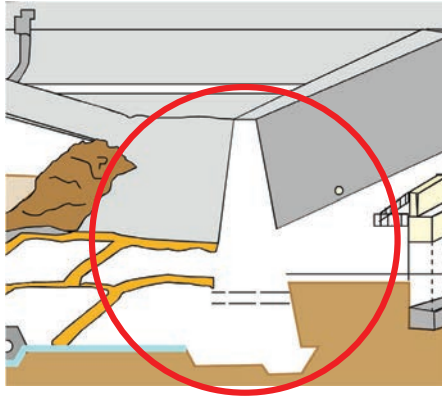
### Anaerobic landfill



## 2.1 Facilities in Sanitary Landfill



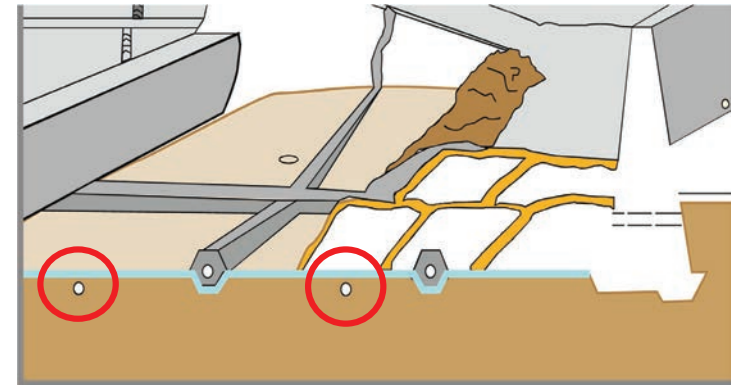
## 2.2.1 Storage Structure



The facility for retaining solid wastes safely to prevent the effluence of solid waste and leachate outside.

5

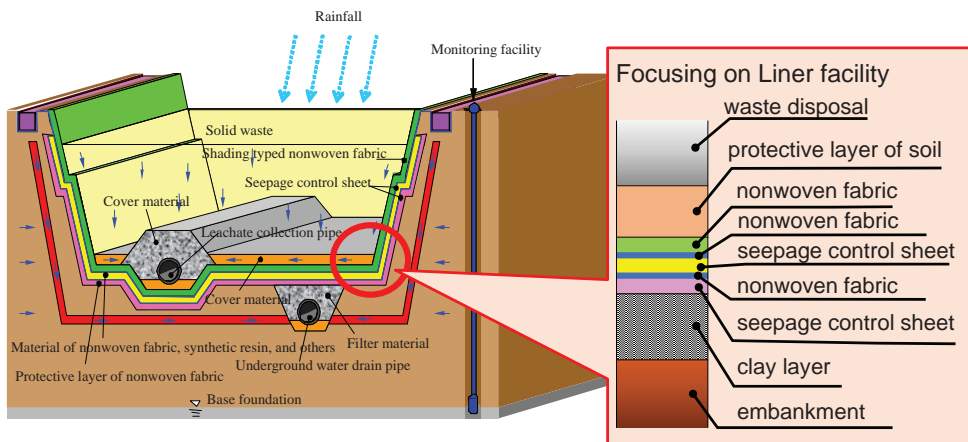
## 2.2.2 Groundwater Collection and Drainage Facilities



The facility for collecting and discharging underground water efficiently to prevent underground water from affecting the effects of seepage control work.

6

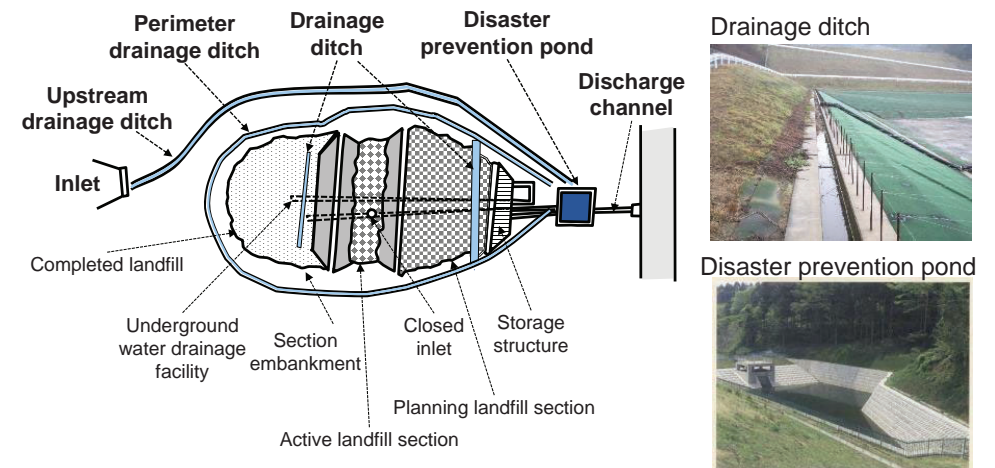
## 2.2.3 Liner Facility



The facility for cutting off the effluence of leachate outside the landfill to prevent environmental pollution of the peripheral area.

7

## 2.2.4 Rainwater Collection Facility

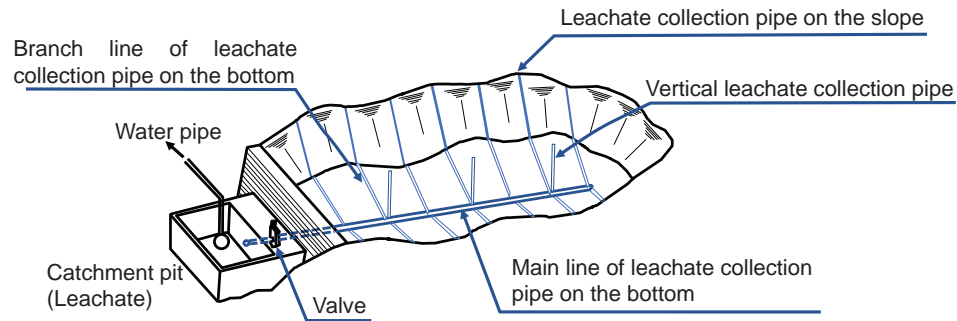


The facility for preventing rainwater from flowing into the landfill site, and to reduce the amount of leachate.

8



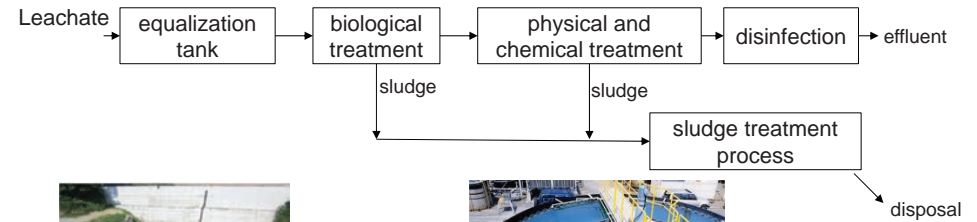
## 2.2.5 Leachate Collection Facilities



The facility for the collection and discharge of leachate, and intaking the fresh air into the landfill in Fukuoka method.

9

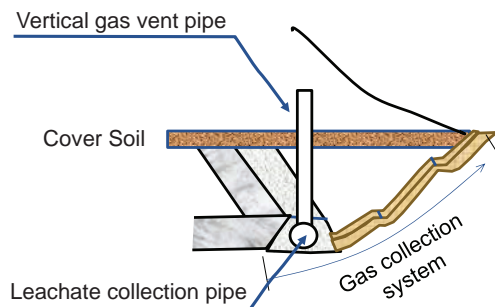
## 2.2.6 Leachate Treatment Facility



The facility for treating leachate to meet the designed effluent quality standard, and preventing leachate from contamination of a public water body and underground water.

10

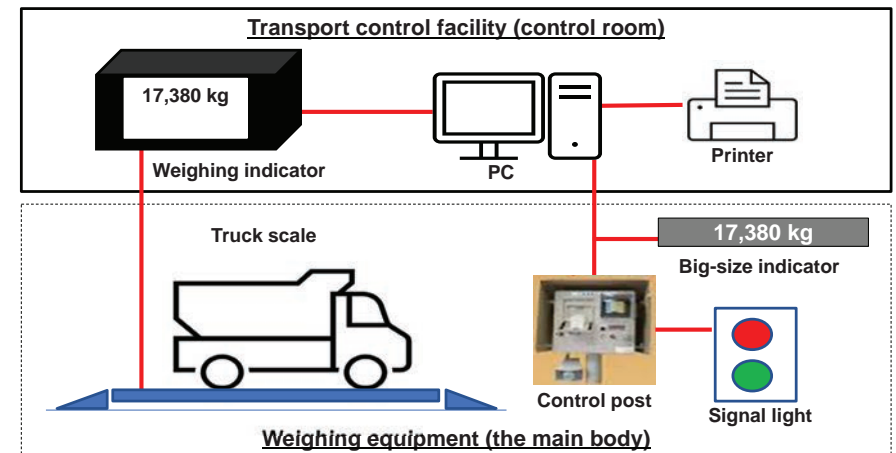
## 2.2.7 Landfill Gas Treatment Facilities



The vent for the emission of the landfill gas and the admission of the fresh air.

11

## 2.3.1 Transport Control Facilities



The facility for weighing, tallying, and recording transported solid waste.

12



### 2.3.2 Environmental Monitoring Facilities



The facility is for the equipment management to monitor the environmental factors, ex. a thermometer, pH meter, conductivity meter, and a water level meter of groundwater well.

### 2.3.3 Control Building



This facility is for the comprehensive management of a series of operations at the landfill site.

14

### 2.3.4 Road Equipment



The road on the landfill site used for daily operation and maintenance.

### 2.3.5 Vehicle Wash Facility



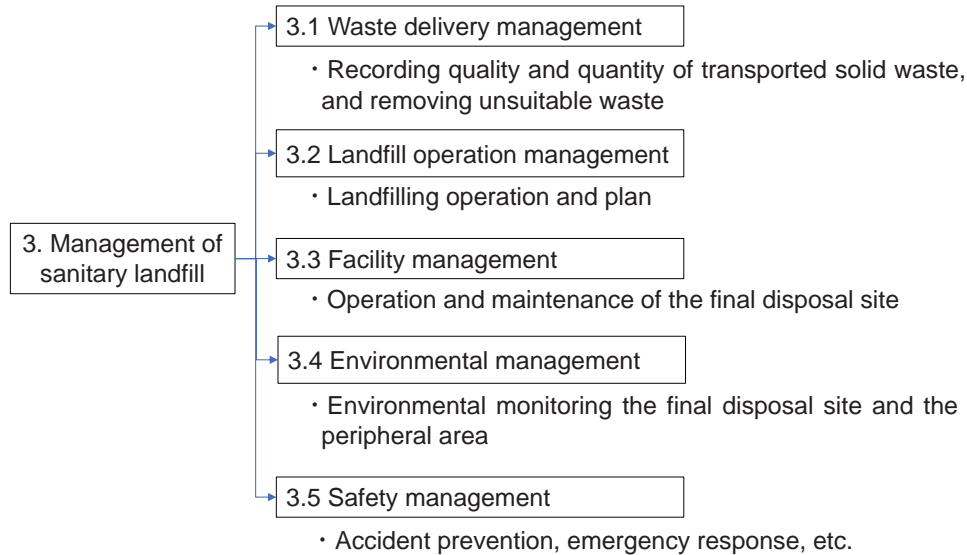
The facility is for washing the vehicles exiting the landfill site and preventing environmental pollution of the surrounding areas.

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### 3. What is Sanitary Landfill Management?

The followings are necessary for sanitary landfill management



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#### 3.1.1 Transported Waste

### 2) Waste Acceptance Criteria

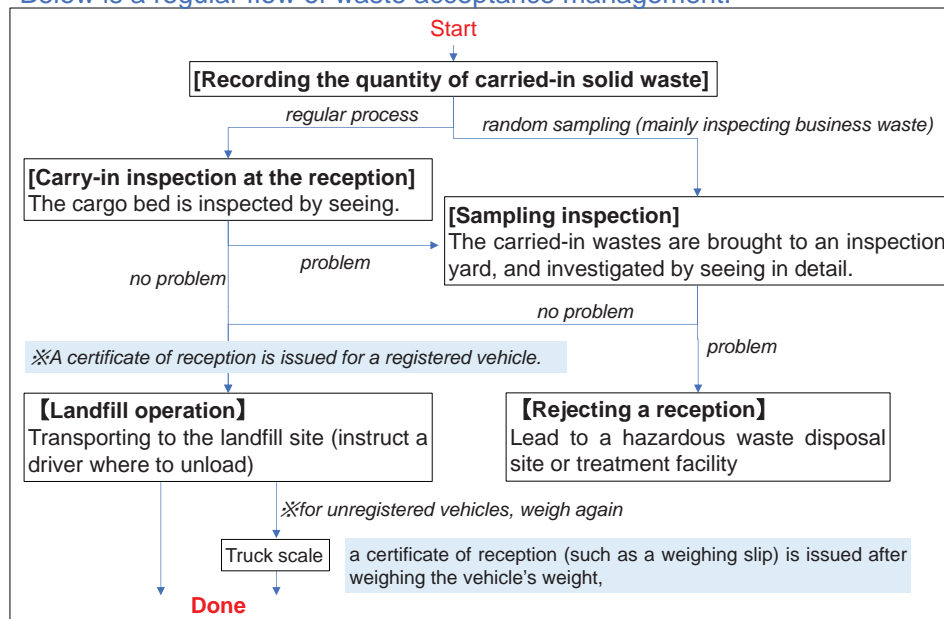
The following waste should be unaccepted in the landfill.

classification	exemplification
(1) Industrial waste	Cinders, sludge, wood waste, construction waste, waste plastic, rubber waste, mineral scraps, soot and dust, waste oil, waste acid, etc.
(2) Toxic and noxious substances	Parts using PCBs included in the following Scrapped air conditioners, TVs, microwave ovens Items that are contaminated with pesticides, deleterious chemicals, or other toxic substances Items for which landfill disposal is prohibited by the law
(3) Fire and flammable materials	Cinders, leftover burnt materials that catch fire. High-temperature items Explosives, paints, gas cylinders, solvents, etc.
(4) Items that emit a significant odor or sewage	Urine, decomposed animal and vegetable residues, etc.
(5) Difficult-to-dispose-of materials	Fire extinguishers, batteries, tires, automobiles, motorcycles, large agricultural machinery, pianos, septic tanks, pruned trees over 50 cm in length
(6) Infectious waste	Waste containing or potentially containing infectious pathogens, such as gauze and needles with blood on them from medical institutions, etc.

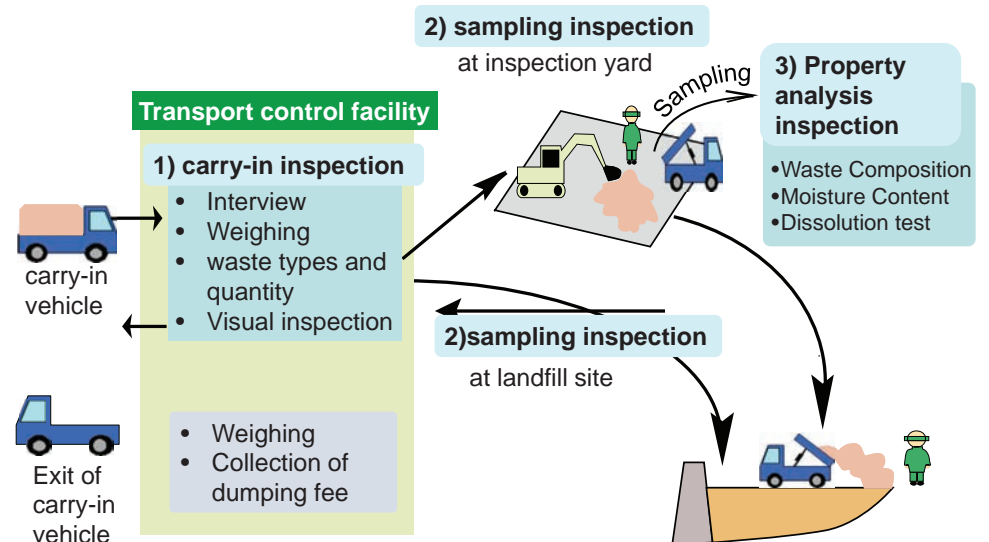
18

#### 3.1.3 Acceptance Management Flow

Below is a regular flow of waste acceptance management.



#### 3.1.4 Acceptance Test

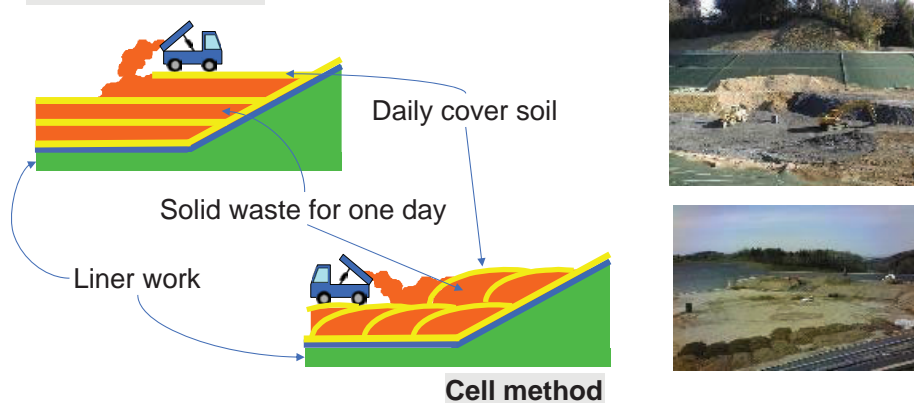


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## 4) Landfilling Method

There are two kinds of landfilling methods.

### Sandwich method



The cell method is better in terms of environmental and safety management.

21

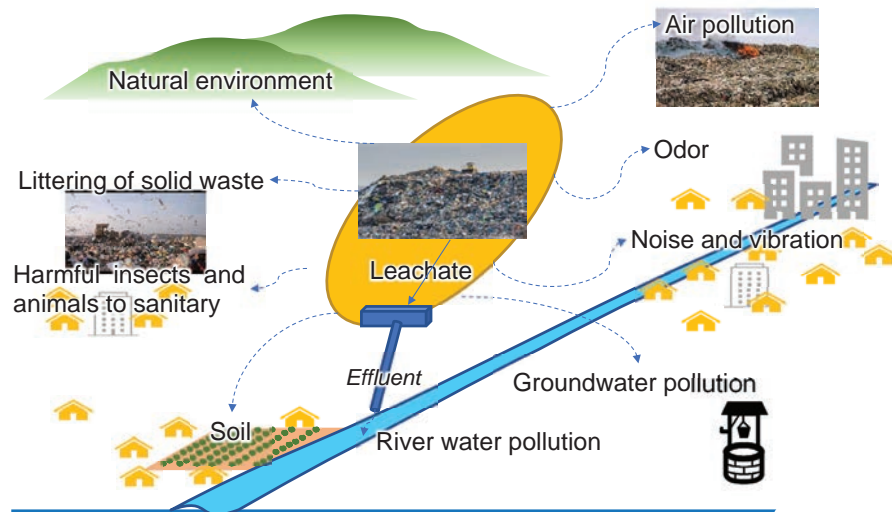
## 5) Landfilling Equipment

Type	Waste		Protective soil and cover			Transport	Movement
	Leveling	Surface compaction	Excavation	Leveling	Surface compaction		
Bulldozer	⊙	○	△	⊙	○	×	○
Tractor shovel	○	○	⊙	○	○	○	○
Compactor (Blade)	⊙	⊙	×	○	⊙	×	×
Compactor (Bucket)	○	⊙	△	△	⊙	○	×
Hydraulic power shovel	×	×	⊙	△	×	×	×
Wheel Loader	○	×	△	○	×	○	⊙

22

## 3.4 What is Environmental Management?

Landfill activities influence the surrounding environment.



23

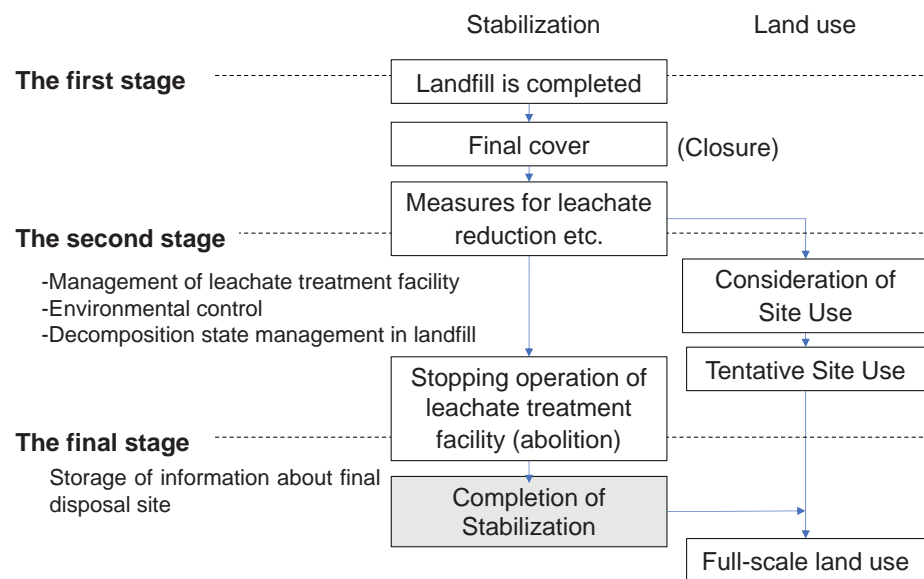
## 3.4.6~11 Surrounding Environmental Management

Measuring each environmental item outside the landfill site.

Measurement item		Frequency
3.4.6 River water	pH, BOD, COD, SS, T-N, Ca <sup>2+</sup> , CL <sup>-</sup> , etc.	1 time/month
	Environmental standard items related to water pollution, etc.	1 time/year
3.4.7 Odor	Odor 22 substances (see the guideline)	1 time/year
3.4.8 Sediment	Regulations (see the guideline)	1 time/year
3.4.9 Noise and Vibration	Machine operating noise and vibration	1 time/year
	Road traffic noise and vibration	1 time/year
3.4.10 Air pollution	Dust	1 time/year
3.4.11 Natural Environment	Animal : categorize the species and count the number	1 time/year
	Plant: categorize the species and count the number	1 time/year
	Scenery: record the landscape around the landfill site by photo	1 time/year

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## 4.1~4.4 Outline of closing a landfill and land use after



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## Scenery of trainings



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# PROPOSED STRATEGIES TO ATTAIN FINANCIAL SUSTAINABILITY OF SOLID WASTE MANAGEMENT IN MAPUTO CITY

THE PROJECT FOR CAPACITY DEVELOPMENT TO REALIZE INTEGRATED SOLID WASTE MANAGEMENT IN MAPUTO CITY

DSMAS + JICA Project Team  
MATERIAL PREPARED ON JUNE 2022

## OVERARCHING PRINCIPLE

### EQUITABILITY



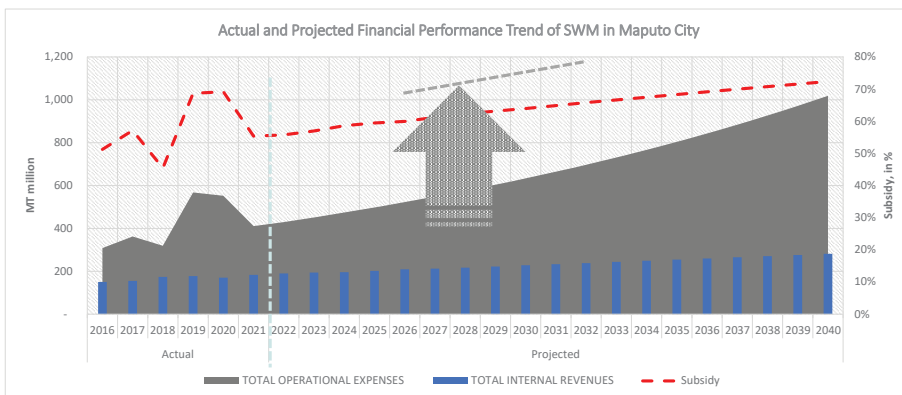
Revenue enhancement without raising fees;  
Cost optimization without sacrificing operations.

Attaining financial sustainability will be based on measures that will correct current systems, provide mechanisms that would ensure transparency and fairness in transactions; and in so doing, encourage better participation and more responsible attitude towards solid waste management from the general public of Maputo City.



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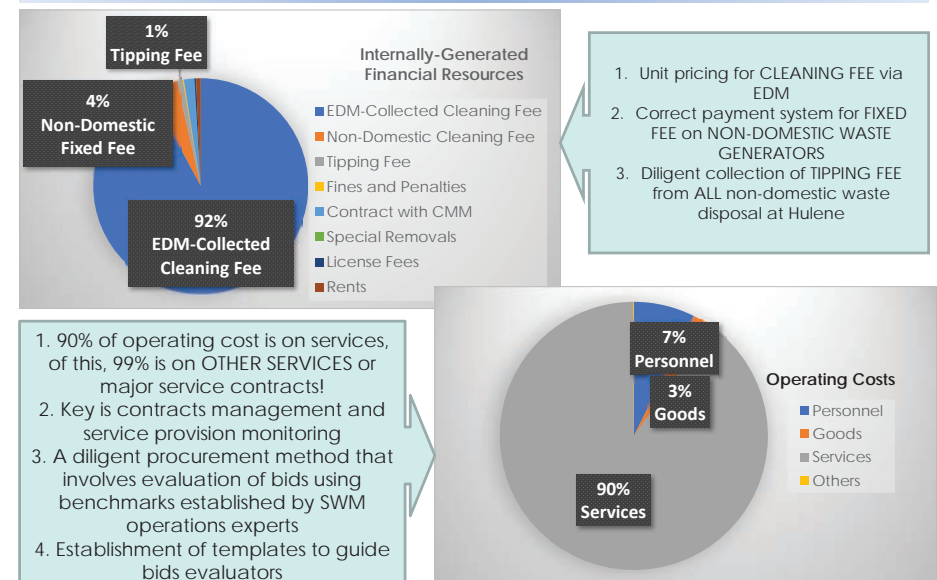
## BASELINE FORECAST



- Without intervention in revenue enhancement and cost-mangement that are duly supported by strong legislation or policy, the SWM sector will continue to be heavily subsidized over the years, exceeding **70%** in 2040
- Scenario will be much worse** as the sector plans to invest in capital-intensive technology over time
- Costs may potentially **shift to double in about 5 years** in anticipation of landfill in Katembe.

3

## STRATEGIES WILL TOUCH ON....



4

## REVENUE ENHANCEMENT: Cleaning Fee Structure

As much as it is unrelated to SWM cost and waste generation, the present fee structure is socially unjust.

Current cleaning fees collected by EDM

Consumption	Domestic		Non-Domestic	
	kwh	MT	kwh	MT
Low	Up to 200	45	Up to 200	80
Medium	201-500	75	201-500	160
High	500 <	110	500 <	250

Survey results show statistically significant positive correlation between waste generation and electricity consumption.

Higher electricity consumption indicates greater economic activities translating to more waste generation.

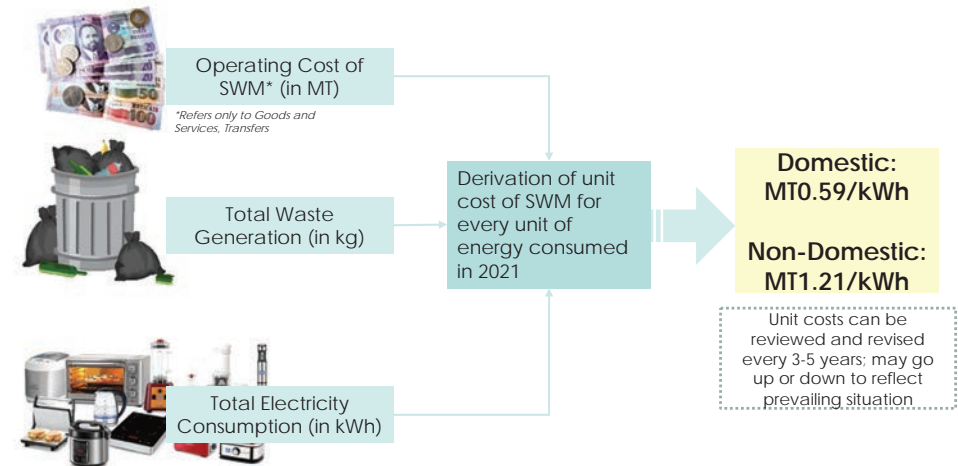


Cost of managing waste is directly related to volume of waste generated by population, businesses and insitutions in the City. Everyone can contribute to supporting SWM through fair distribution of cost.

5

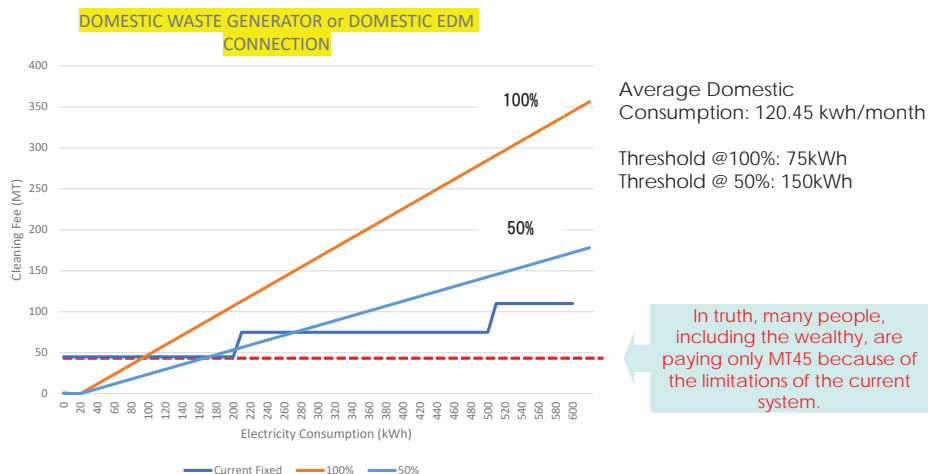
## REVENUE ENHANCEMENT: Cleaning Fee Structure

By putting together three major factors in Maputo City in 2021:



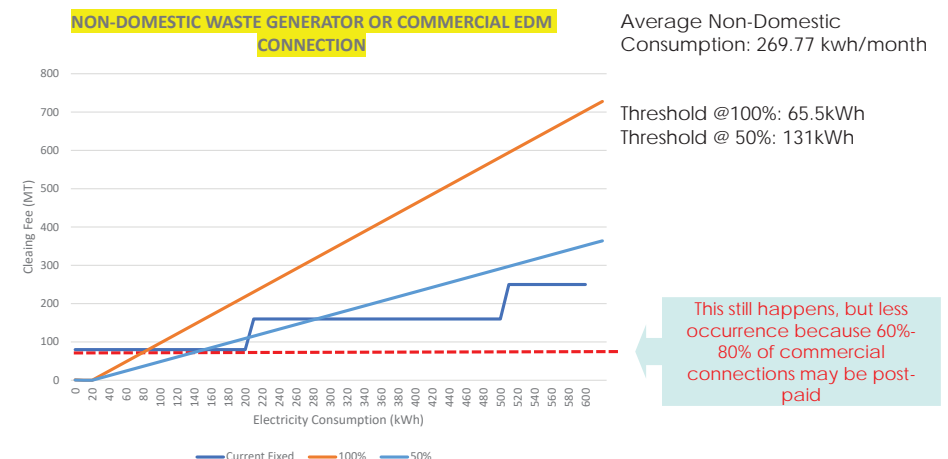
6

## REVENUE ENHANCEMENT: Cleaning Fee Structure



7

## REVENUE ENHANCEMENT: Cleaning Fee Structure



8



## REVENUE ENHANCEMENT: Non-Domestic Cleaning Tax and Method of Collecting It

### Recorded/"collected" under PdS

1. Monthly printing and distribution of invoices manually by Supervisors
2. Payor goes to bank to pay
3. Payor provides PdS proof of payment
4. HIGH tendency of non-domestic waste generators NOT to pay
5. Low collection efficiency rate: 18%
6. 2021 revenue: MT8.2million

Based only on 10,000 entities registered in PdS

### Current fixed cleaning fee collected from non-domestic waste generators

Category	Waste Generation per day	Corresponding Monthly Cleaning Tax
A	More than 350 kg or 1000 liters	MT 5200
B	Up to 350 kg or 1000 liters	MT 2600
C	Up to 200 kg or 500 liters	MT 1300
D	Up to 100 kg or 250 liters	MT 650
E	Up to 25 kg or 50 liters	MT 325

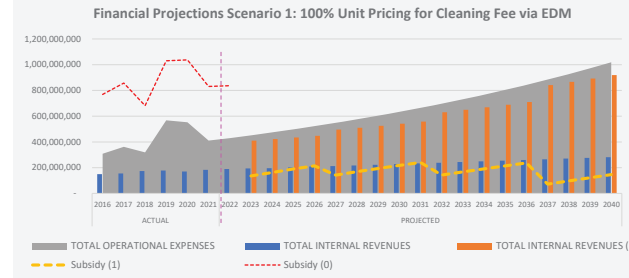
### Actual Survey and data simulation results

### Proposed fixed cleaning fee collected from non-domestic waste generators

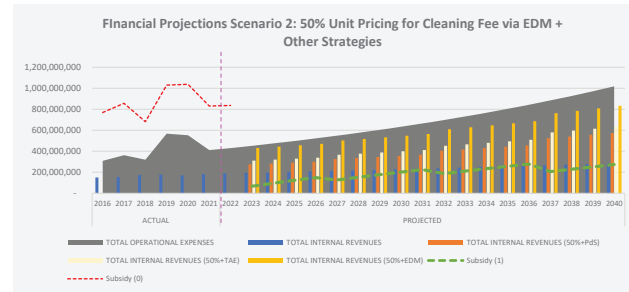
Category	Waste Generation per day	Corresponding Monthly Cleaning Tax
A	More than 300 kg or 850 liters	MT 2,600
B	Up to 300 kg or 850 liters	MT 1,300
C	Up to 200 kg or 500 liters	MT 650
D	Up to 100 kg or 250 liters	MT 325
E	Up to 25 kg or 50 liters	MT 162

Still based only on 10,000 entities registered in PdS! Potential for radical improvement in this revenue is high with better information on non-domestic sector.

## Possible Cost-Recovery Scenarios



Average subsidy: **11%**  
 Pro: 1. Highly efficient collection system  
 2. Highly transparent  
 3. No need for fixed fee from non-domestic waste generators  
 Con: 1. High-impact of cleaning fee on electricity bill (up to 10% for domestic; >20% for commercial)



Best-case average subsidy: **12%**  
 Pro: 1. Highly efficient collection system  
 2. Highly transparent  
 3. Reasonable impact on electricity bill  
 Con: 1. Fixed fee from non-domestic waste generators needed  
 2. Need for strong collab with EDM

## CRITICAL ACTIVITIES/INSTITUTIONAL LINKAGE SUPPORT REVENUE ENHANCEMENT

- Stronger efforts in public information dissemination: MESSAGING WILL be very important
- Strong collaboration among CMM Business Registration/Revenue Sections, DSMAS and EDM especially on information-sharing/data integration

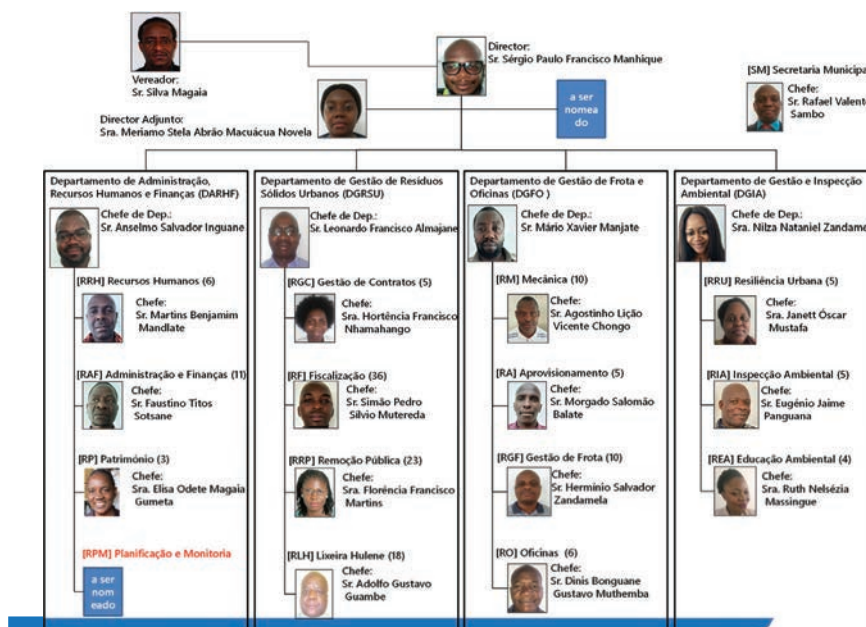


Thank you

# Plan for DSMAS Organizational Reform & Human Resources Development

December 2022

## DSMAS Organizational structure



2

## Recommendation on DSMAS organizational reform

- **Concept:**  
**Strengthening contract management function and planning & monitoring function.**
- 1. **Enhancing RGC (Contract Management Section)**  
Contract management for private service providers has already become the major task of DSMAS, i.e., primary collection service contracts (46 MEs), secondary collection service contracts (6 districts), and Hulene dumping site operation contracts, which account for 90% of DSMAS operating expenses.
- 2. **Re-creation of Proof of Service (PdS) section**  
Responsible for the management and operation of the PdS system, which is an important management tool of business waste generators (including the collection of cleaning taxes).

3

## Recommendation on DSMAS organizational reform

3. **Realizing RPM (Planning and Monitoring Section)**  
Responsible for monitoring the implementation of M/P and A/P, formulating and updating various plans, and centrally managing various information and data within DSMAS.
4. **Enhancing REA (Environmental Education Section)**  
Responsible for coordination and liaison with related actors for the promotion of recycling, in addition to various environmental education and awareness activities.
5. **Optimizing DGFO (Department of Fleet Management and Workshops)**  
Waste collection & transportation, and final disposal site operations are increasingly outsourced to the private service providers, and maintenance of heavy equipment and vehicles currently owned by DSMAS is often outsourced.

4

## Recommendation on DSMAS organizational reform

### 6. Optimizing RRP (Public Removal Section)

Responsible for waste collection services for several government facilities and special collection services for illegal dumping. Currently, RRP provides waste collection services to some business waste generators, but it should be left to licensed private service providers.

### 7. Creation of Katembe landfills management section

Assuming Katemebe will be operated by private service providers, a contract management section for landfill operation will be necessary.

## Human Resources Development

- DSMAS staff list with current position & affiliation was prepared.
- The project team intend to develop DSMAS human resources database by integrating information on:
  - Background education
  - Work experience
  - History of training
- The database will be utilized to examine staff relocation among the sections, on-the-job and off-the job trainings program for DSMAS staff.

## Updating CMM Ordinances & Resolutions concerning to SWM

- The project team is working on identifying and analyzing policy gaps to realize the measures in the M/P such as:
  - All businesses, generating even less than 25 kg/day of waste, should not discharge it into CMM containers.
  - Distinguish WCSPs for municipal waste & business waste.
  - All waste trucks must pay the tipping fee at Hulene.
    - To avoid free-riding of business on CMM collection service.
    - To avoid unpayment of business waste tipping fee.

## Updating CMM Ordinances & Resolutions concerning to SWM

- Revise cleaning fee tariff collected through EDM.
- Change collection system of business waste cleaning tax.
  - To improve financial sustainability of SWM service.
- Clearly state each actor's responsibility for source separation and recycling promotion.
- Establish a platform for promotion of recycling and awareness raising.
- Support association of waste pickers
  - To reduce waste disposal & promote 5Rs.

Thank you



## Public Awareness and Environmental Education

### Output 6

#### I. Waste Segregation

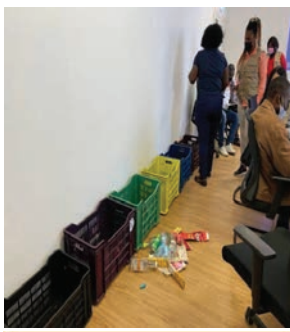
- ☐ 7 Workshops were held to train staff in waste segregation, with about **201 participants**
- ✓ 1 in Maputo City Hall attended by 18 people;
- ✓ 5 in DSMAS attended by 172 people;
- ✓ 1 in Matola Municipality attended by 11 people.



Workshop - CMM



Workshop - DSMAS



Workshop - Matola

## Contents of Presentation

- I. Waste Segregation
- II. Training on Eco-Points Operation
- III. Activities at Primary Schools
- IV. “Bairro Mais Limpo” Contest
- V. Other Activities
- VI. Summary: Major Achievements and Way Forward

#### II. Training on Eco-Points Operation

- ☐ **12 responsible for the eco-points were indicated**

Identified problem: Inadequate use of eco-points installed at DMAS.

Solution: Appointment of staff to ensure that the segregation is done according to the type of waste to be separated for recycling.





### III. Activities at Primary Schools

#### Major actions achieved at 5 schools:

- **Creation of Environmental Clubs** - which aims to raise awareness of children on environmental problems and their respective solution through good environmental practices, **about 184 children attended**;
- **Launch of SPO GOMI Competition** - which consists of a selective collection technique developed in Japan that incorporates elements of sport, **about 65 children participated**;
- **Eco Picture Diary** - aims to awaken children to identify environmental problems, through free drawings, **it involved about 70 children**.

### 3.1. Environmental Clubs

#### Theoretical



#### Practical



Primary Schools of 7 de Setembro, Filipe Samuel Magaia, 9 de Agosto and Combantes de Liberdade Nacional

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### 3.2. SPO GOMI Competition Primary School of 25 de Junho



56.24 kg of waste was collected and subsequently delivered to a recycling company.

### 3.3. Eco-Picture Diary



Primary Schools of 9 de Agosto and Combatentes de Liberdade Nacional

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## IV. “Bairro Mais Limpo” Contest

- Community integration in MSWM, involving neighbourhood residents, with the support of JICA.
- ✓ Distribution of dissemination material;
- ✓ Monitoring;
- ✓ Awarding



## 4.1. Awarding Ceremony of “Bairro Mais Limpo” Contest

The ceremony was led by H.E. Maputo City Mayor, with the participation of JICA experts.



Maputo City Hall

## V. Other Activities

- Planting and Exhibition Fairs



Primary School of 9 de Agosto, Expo FACIM and PGR

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## V. Other Activities

Seminars with organizations and institutions that promote Environmental Education

- MINEDH, DPPRMA, UP, Neighbourhood Secretariats, Repensar, Sérgio Gago Foundation, among others.



7/12/2023

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## VI. Summary: Achievements Output 6 (Environmental Education)

### • Major Achievements:

- Launch of SPO-GOMI Activity;
- Activities at Primary Schools;
- Waste Segregation workshops at CMM and in Matola.
- Distribution of dissemination and awarding material of “Bairro mais Limpo” Contest.

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## VI. Summary: Way Forward Output 6 (Environmental Education)

### • Way Forward:

- Continue with school activities: environmental clubs, eco-picture diary, SPO-GOMI, seminars, study visits and exhibition of reusable material;
- Bairro mais Limpo contest, 2023 edition;
- Continue with seminars with organizations and institutions that promote Environmental Education.

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Khanimambo!  
Muito Obrigada!

- ありがとう
- Arigatō

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