

**The Republic of Mozambique
Directorate for Solid Waste Management and Cemeteries
Municipal Council of Maputo**

**The Project for Promotion of Sustainable
3R Activities in Maputo
in the Republic of Mozambique**

Project Completion Report

September 2017

Japan International Cooperation Agency (JICA)

Nippon Koei Co., Ltd.

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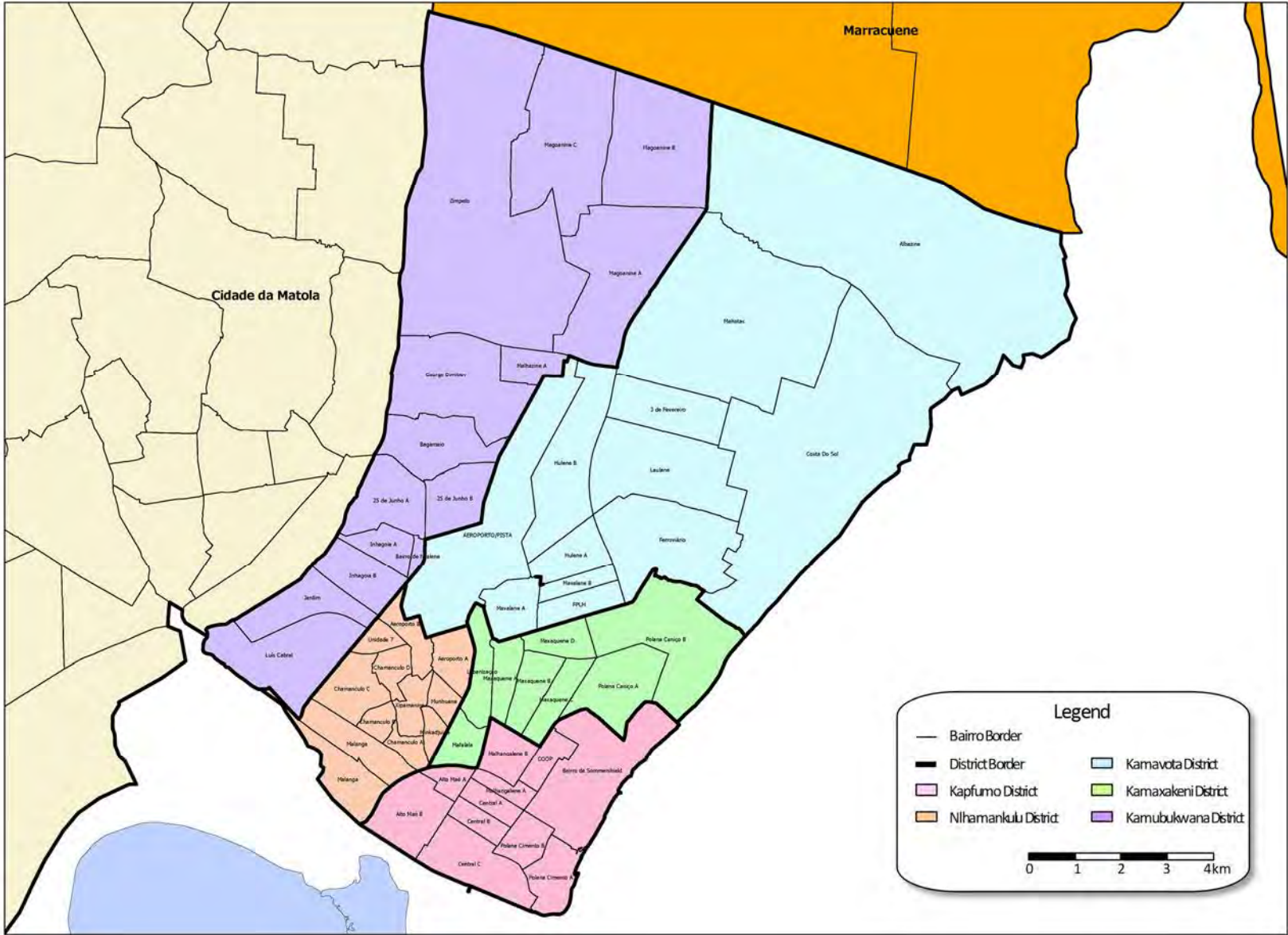
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Location Map of Maputo City



Source: National Statistic Institute

Bairros and Districts in Maputo City

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Acronyms

Organization, program

GECPA	Office of Civic Education and Environmental Promotion of DMSC (GECPA is abbreviated in Portuguese)
CMM	Municipal Council of Maputo
DGRSU	Department of Urban Solid Waste Management
DMSC	Directorate for Waste Management and Cemeteries
DPM	Department of Planning and Monitoring
EDM	Mozambique public enterprise of electricity (Electricidade de Moçambique)
FUNAB	Environmental Fund (Fundo do Ambiente)
GIZ (former GTZ)	The federal enterprise of German for international cooperation for sustainable development (Deutsche Gesellschaft für Internationale Zusammenarbeit)
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
MICOA	Ministry for the Coordination and Environmental Affairs
MITADER	Ministry of Land, Environment and Rural Development
NGO(s)	Non-governmental organizations
OECD	Organization for Economic Co-operation and Development
PdS	Proof of Service Section (Prova de Serviço)
PROMAPUTO (II)	Maputo Municipal Development Program (Phase II) funded by World Bank
ACCP	African Clean Cities Platform
WB	The World Bank

Technical terms

CDM	Cervejas de Moçambique
C/P	Counterpart personnel
EPR	Extended Producer Responsibility
HDP	High Density Polyethylene
LDP	Low Density Polyethylene
ME	Micro enterprise
MOPA	Participatory Monitoring Pilot Project (Monitoria Participativa Maputo)
MOU	Memorandum of Understanding
M/P	Master Plan
Mt	New meticals [currency in Mozambique]
PDCA	Plan, Do, Check and Action
PDM	Project Design Matrix
PE	Polyethylene
PET	polyethylene terephthalate
PP	Polypropylene
P/P	Pilot Project
PPP	Polluter Pay Principle
	Public-private partnership
Pr/R	Progress Report
PSP	Private Service Provider
RCT	Randomized controlled trial
R/D	Record of Discussion
SWM	Solid waste management
3R	Reduce, Reuse, Recycle

Glossary

Bairro(s)	Local word represents a category in administrative structure in Mozambique. A Municipal district is composed of bairros. It is translated as “neighborhood(s)” in English.
Cement City	Urban area of Maputo City corresponding to KaMpfumo municipal district
Existing M/P	The authorized master plan of solid waste management in Maputo City prepared in 2007 with assistance by GIZ
Micro enterprises	Small scale enterprises locally established which are in charge of waste primary collection in suburban area based on the contract with CMM
Tchova(s)	Local word represents push cart which is normally used for transportation of stuff. Tchova is used for waste primary collection in suburban area of Maputo City.
International Seminar on Solid Waste Management in African Countries	International Seminar with the purpose of the knowledge-sharing of the project and preparatory meeting for establishment of “African Clean Cities Platform” was held in Maputo from April 25 to 27, 2017.

1. PROJECT SUMMARY

1.1 Background

Be it a developing or advanced nation, the whole world works together in its struggle to manage the increasingly severe solid waste problem that has been accompanied by the advancement of urbanization.

The situation in Maputo City, the capital of Mozambique is no different. In accordance with the recent population growth, the amount and types of wastes have also been increasing. To combat this, the regulation for solid waste management (SWM) was enacted in 1997. Solid waste in the capital was managed but due to the interference of various actors like the non-governmental organizations (NGOs) and private entities the system could not keep up, and a suitable SWM system had yet to emerge.

Because of this, the Municipal Council of Maputo (Conselho Municipal de Maputo: CMM), with cooperation from the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) (currently known as the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)), established the “Master Plan for Solid Waste Management in Municipal Council of Maputo (hereinafter referred to as M/P)” and worked towards various improvements for a comprehensive waste management. However, the institutional vulnerability of CMM, particularly the technical aspect of SWM obstructs the progressing adaption of appropriate waste management. Consequently, the Reduce, Reuse, Recycle (3R) concept proposed in M/P, despite the existing recycling practice of valuables, has various problems regarding its promotions and development.

Under these circumstances, a technical cooperation was requested to the Japanese government for improving Maputo’s SWM and promoting 3R activities. In May 2012, upon accepting this request, the Japan International Cooperation Agency (JICA) implemented the detailed planning survey and the results of the survey confirmed the necessity to support the improvement of CMM’s capacity and verified the various problems with regard to the promotion of 3R activities. On November 27, 2012, JICA came to a mutual agreement with CMM regarding the technical cooperation project design and the Record of Discussion (R/D) was filed.

Based on the R/D, the project has commenced in March 2013 and the activities were implemented for about 4 years until May 2017.

This Project Completion Report is to report the activities implemented and achievements during the whole project period from March 2013 to May 2017.

1.2 Project Objectives and Details

1) Project Objective

This project intends to manifest the expected outputs to achieve the purpose of the project by implementing activities based on the R/D and attached Project Design Matrix (PDM) regarding “The Project for Promotion of Sustainable 3R Activities in Maputo in the Republic of Mozambique.”

2) Target Area

Maputo City (excluding Katembe and Inhaca)

3) Project Duration

March 2013 to May 2017 (51 months)

4) Related Organizations

- Project executive agencies: Directorate for Waste Management and Cemeteries (DMSC), CMM
- Target groups: CMM and people living in Maputo City

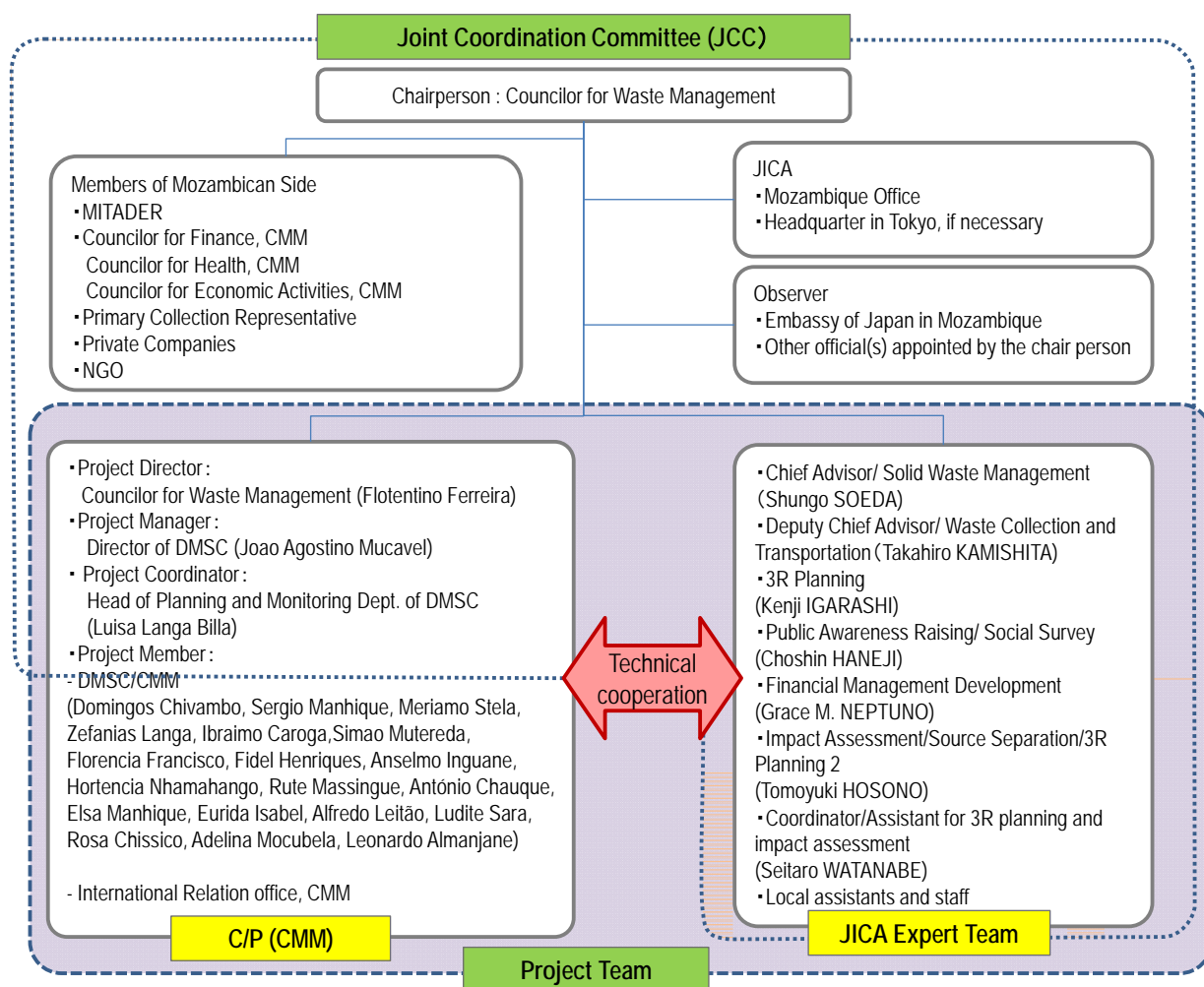
- Related government agencies and private organizations: Other CMM directorates aside from DMSC, the Ministry for the Coordination and Environmental Affairs (MICOA), NGOs, and private entities.

5) Implementation Structure

The implementation structure comprised the Joint Coordination Committee (JCC), Maputo City counterpart personnel (C/P), and the JICA expert team as illustrated in Figure 1.1.

Over the course of this project, JCC met eight times to consult and decide on the annual work plan, approve indicators in the PDM, and report on the project completion.

The JCC members were listed in Appendix-1 Annex IV of the R/D (November 2012), and was confirmed, decided upon at the first JCC on April 1, 2013, including the official appointment of the C/P. This implementation structure was modified during the project, when needed.



Source: JICA expert team

Figure 1.1 Implementation Structure of the Project

2. SUMMARY OF ACTIVITIES

2.1 Activities for Output 1

2.1.1 Review the existing M/P and identify differences compared to actual situation (Activity 1-1)

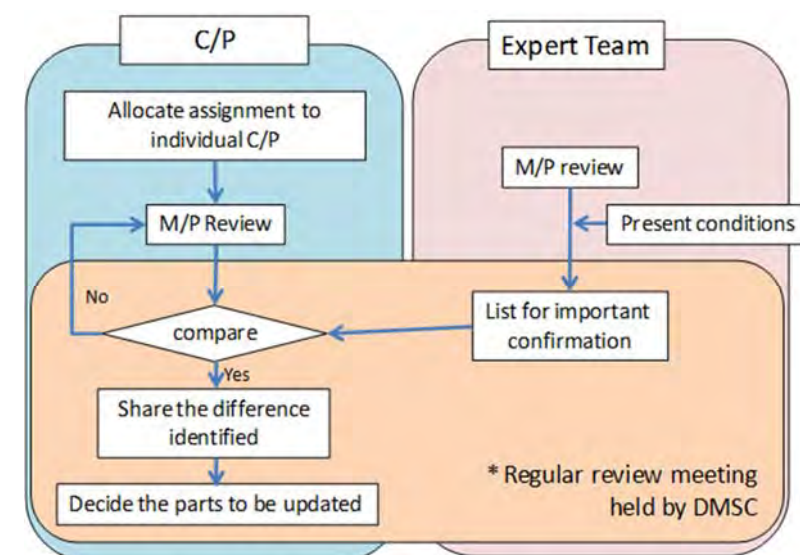
This Activity was conducted in the first year of the Project.

There was no one who was involved in the preparation of the current M/P in DMSC. In addition, any C/P of the project had not fully understood the detail contents of the M/P.

On the other hand, DMSC has been monitored the M/P based on the monitoring index proposed in the M/P and updated by them.

Based on these situations, it was tried that the M/P would be, especially “Chapter 4 (Current Conditions)” and “Chapter 6 (Planning)”, reviewed by the C/P independently but with the technical support of JICA experts.

In the review of the existing M/P, as shown on Figure 2.1, each component of waste management listed in Chapter 4 of the M/P (budgetary & financial affairs, collection & transportation, final disposal, waste reduction, etc.) was assigned a C/P. Through referring to the results of past annual CMM monitoring and other information, each component conducted its own review of its C/P.



Source: JICA expert team

Figure 2.1 Review Flow of the M/P

Chapter 4 was reviewed by the C/P by reading the contents by themselves first, then the C/P pointed out and described 1) Discrepancy between description in M/P and present situation, 2) Present situation/issues to be added, 3) Additional information to be collected, and 4) Examination and study necessary for updating the master plan, by using the review sheet prepared by the JICA expert team.

JICA expert who is in charge of each component gave his/her comments on the review result by the C/P. In addition, the review meetings were organized several times to share the results and comments among other C/P and JICA experts.

Following above activities, it was also tried that the C/P will prepared the text report of the current situations based on their review result as written in the current M/P. JICA experts prepared and gave the text format of the M/P to the C/P and each C/P re-wrote those texts. Each component re-written by the C/P was compiled as the final output for the current conditions in the update M/P.

Furthermore, at the same time as the review of the existing M/P, we conducted a capacity survey to gain a better understanding of the current situation. The capacity assessment was subcontracted and consists of a situational survey and a social survey.

In addition, field surveys such as waste quality and quantity survey and time and motion survey were also conducted under the direct operation by JICA expert team with the participation of the C/Ps.

2.1.2 Collect and review latest information and data of waste quantity, composition and final disposal volume (Activity 1-2)

This Activity was conducted in the first and second years of the Project.

1) Result of the waste data surveyed in 2009- 2010

As the reviewing activity on the existing data, the result of the waste quantity and composition survey conducted by AGRESU in 2009 and 2010 was reviewed. The contents of survey conducted by AGRESU is shown in Table 2.1

Table 2.1 Surveys conducted by AGRESU in 2009-2010

Survey Period	Target area	Areas/Bairros	Data acquired
29/09/2009 – 08/10/2009	Suburban area	Maxaquene, Ferroviário, Zimpeto	Composition and density
	Cement city	“Coop”, “Avenidas”, “Malhangalene”	Composition, density and generation
17/02/2010 – 23/02/2010	Suburban area	Maxaquene A & B, Ferroviário, Zimpeto	Composition, density and generation
15/03/2010 – 25/03/2010	Cement city	Sommerschield (including “Sommerschield 2”)	Composition, density and generation
24/03/2010 – 01/04/2010	Cement city	Alto Maé A & B, Central A, B & C, Coop, Malhangalene A & B, Polana Cimento A & B.	generation

Source: AGRESU Report 2010

The results of surveys conducted by AGRESU are shown in Table 2.2 and Table 2.3.

Table 2.2 Composition of domestic waste by AGRESU survey in 2009-2010

Physical Composition	Urban area [%-weight]	Suburban area [%-weight]
Paper	3.8	1.5
Cardboard	5.6	1.7
Rags/ Rubber	1.5	4.2
Metals	2.8	1.2
Glass	7.5	2.8
Soft plastic	5.2	3.9
Hard plastic	3.2	2.7
Disposable paper	3.8	0.8
Organic matter	63.7	37.0
Fine fraction [incl. sand]	-	44.2
Other	2.8	0.0

Source: AGRESU Report 2010

Table 2.3 Generation rate of domestic waste by AGRESU survey in 2009-2010

Area	Classification	Waste generation rate [kg/day/capita]	
		With fine fraction	Without fine fraction
Urban area [cement city]	High income	1.45	-
	Average income	0.99	-
	Low Income	0.70	-
Suburban area	High density	0.81	0.51
	Middle density	0.93	0.50
	Low Density	1.25	0.67
	Agricultural	0.60	-

Source: AGRESU Report 2010

2) Waste quantity and composition survey**2-1) Background and objective**

The waste quantity and composition data should be updated regularly. Through the analysis of data regularly updated, the trend of waste generation and changes in composition of waste could be observed. In this sense, the survey was conducted to accumulate these data in the directorate and to experience the planning, implementation and analysis process for further continuation of this type of survey in future.

2-2) Waste Generators Surveyed

The type of waste generators surveyed and number of sample are shown in Table 2.4 and Table 2.5.

Table 2.4 Sample of the waste quantity and composition survey [households]

Area	Category/Name of Neighborhood	Number of Sample	
		Dry	Rainy
Urban area [cement city]	high income: Sommerschild, Polana A	34	35
	middle income: Polana Cimento B, Central A	38	36
	low income: Alto Maé A & B	35	35
Suburban area	high density: Xipamanine	34	35
	middle density: 25 de Junho A	35	35
	low density: Magoanine B	34	35
	Total	210	211

Source: DMSC and JICA expert team

Table 2.5 Sample of the waste quantity and composition survey [business & institutions]

Type	Number of Sample	Name of institution & business entity
Restaurants	8	Mundos, Sagres, Campo di Fiori, Maritimo, Waterfront, Mira mar, Piri, Escorpio
Hotels	5	Radison, Rovuma, Southern Sun, Taj Mahal, Tamariz
Institutions (public)	4	Ministry of Fish, Ministry of Financial,
Institutions (donors)	2	UNDP, UNICEF
Office (private)	2	Maersk, Teledata
Shops	3	Antemax, Macomat, Plass

Source: DMSC and JICA expert team

2-3) Survey Period

The survey period for every targeted generator was consecutive 8 days while wastes sampled on the first day shall be excluded from analysis. This is because the waste bins at generation sources are to be emptied before obtaining data for the survey. Actually, quite bigger amount waste was observed on the first day of waste sampling. The periods of survey are shown in Table 2.6.

Table 2.6 Period of Waste Sampling

Type of waste generator	Dry season	Rainy season
Households	4-12 June, 2013	26 Nov. – 3 Dec, 2013
Restaurants, Hotels	25 June -2 July 2013	6-12 Dec. 2013
Shops, supermarket, institution, office	5 - 12 July 2013	14-21 Dec. 2013

Source: DMSC and JICA expert team

Note: Data obtained in last 7 days were analyzed in the survey.

2-4) Survey Method

The survey was conducted by the procedures shown below.

- Identify and request waste generators to store and provide all solid waste generated in their respective area during survey period
- Pick up waste stored by generators, in principle, every day by surveyors
- Transport the sampled waste to the camp site of DMSC in Xipamanine
- Weigh and measure the volume of the sampled wastes by waste generators
[→ weight data of waste generated in each waste generator, density data by generator type]
- The sampled wastes are mixed well and divided into appropriate size (approximate 50kg) for waste composition survey.
- The surveyor manually segregate the wastes by materials. The segregated materials are weighed by materials [→ weight data for physical composition]

Basic information of selected households such as number of family member, type of residence, was identified by interview to the residents. Basic information of selected business or commercial entities was also identified, such as number of staff, number of rooms in hotels during the survey.

2-5) Summary of survey result

The result of waste quantity survey and composition survey for households are shown in Table 2.7 and Table 2.8. Another result for businesses and institutions shall be referred from the progress report of the first year.

Table 2.7 Waste Generation Rate [household, kg/cap/day]

		Dry season		Rainy Season	
		With sand	Without sand	With sand	Without sand
Urban area [Cement City]	High Income	0.65	-	1.20	-
	Middle Income	0.58	-	0.67	-
	Low Income	0.70	-	0.62	-
Suburban area	High Density	0.83	0.52	1.00	0.62
	Middle Density	1.26	0.82	1.56	1.07
	Low Density	0.93	0.57	2.89	1.83

Source: DMSC and JICA expert team

Table 2.8 Waste Composition [households, %]

		Urban				Suburban			
		Dry season		Rainy season		Dry Season		Rainy season	
		Average	without particle	Average	without particle	Average	without particle	Average	without particle
1	Paper	3.7	4.2	4.4	4.5	1.0	1.6	1.3	2.0
2	Carton box	6.6	7.4	6.3	6.5	2.0	3.1	2.6	4.1
3	Disposable paper	6.9	7.8	6.4	6.6	3.7	5.9	4.7	7.4
4	Rubber, leather	0.1	0.2	1.3	1.3	1.6	2.5	1.5	2.3
5	Textile	1.1	1.2	2.6	2.7	1.9	3.1	2.4	3.7
6	Compostable food, leaf	42.0	47.6	35.2	36.1	39.9	63.6	31.3	48.5
7	Food waste (non-compostable)	5.8	6.6	16.5	16.9	2.1	3.3	3.3	5.2
8	Wood, timber	1.2	1.4	2.2	2.2	0.0	0.0	2.6	4.1
9	Hard plastic	4.1	4.6	6.2	6.4	2.9	4.6	3.7	5.7
10	Soft plastic	6.3	7.2	7.1	7.3	3.4	5.4	5.0	7.8
11	Metals	2.7	3.1	2.3	2.3	0.9	1.4	1.8	2.7
12	Glass	7.7	8.7	7.0	7.2	3.2	5.2	3.4	5.2
13	Ceramic/stone	0.1	0.1	0.0	0.0	0.1	0.2	0.9	1.5
14	Fine fraction [sand]	11.7	-	2.5	-	37.2	-	35.5	-
15	Others	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

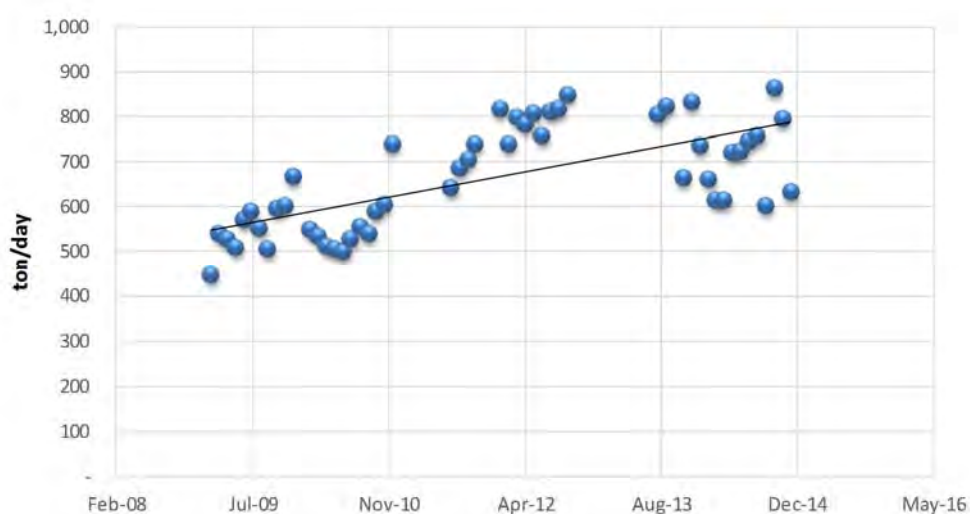
Source: DMSC and JICA expert team

3) Final disposal data

The collected solid waste in Maputo city is hauled and disposed of at Hulene final disposal site. The amount of hauled wastes as well as hauling vehicles are measured and recorded at the weighing scale installed at the entrance of the site. The record includes registration number of vehicle, weight of vehicle and weight of the solid waste. This is very basic and important information to understand and analyze the trend and present situation of waste amount of final disposal.

Because the weighing and recording system faced trouble, the new system was installed in 2012. Even after the renewal of system, there have been the periods when the weighing and recording had been suspended due to frequent failure of electricity as well as system troubles. Apart from those periods, the digitized data have been accumulated in the directorate.

Data during 2009 to 2011 when the previous system functioned well, data during 2011~2012 except ones recognized as unusual, and data 2013 to 2014 excluding ones in the days having missing data due to electricity failure are adopted to illustrate the change of the monthly average of daily waste amount as shown in Figure 2.2. In addition, Table 2.9 shows the monthly data of final disposal quantity per each waste haulers in 2012.



Source: DGRSUS Data analyzed by JICA expert team

Figure 2.2 Daily final disposal amount in last 5 years [monthly average]

Table 2.9 Final disposal amount at Hulene dumping site in 2012 [ton/day]

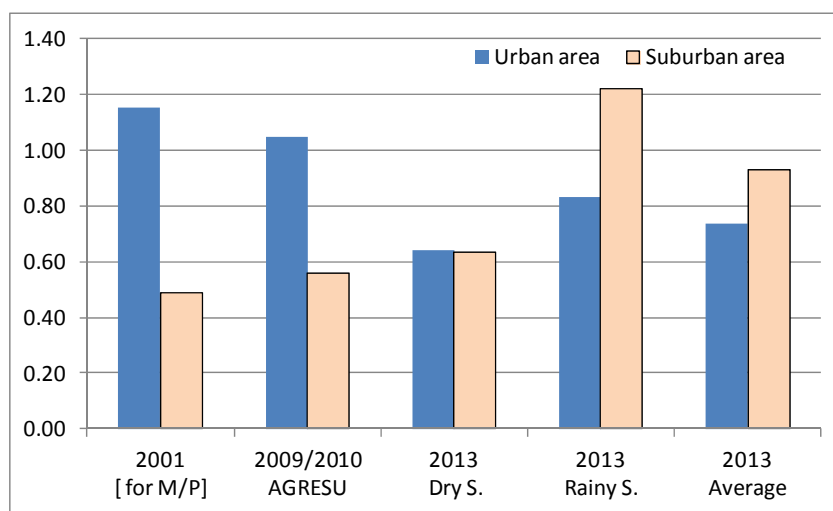
Waste Haulers	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total	Ratio
DMSC	88	60	71	67	53	50	50	51	491	7.9
Enviroserv [urban]	141	154	181	174	169	151	164	173	1,308	21.0
Enviroserv [suburban]	545	508	571	547	555	528	575	587	4,415	70.8
Municipal district	5	3	4	5	2	3	2	1	25	0.4
Total	779	726	826	793	780	732	792	811	6,239	100.0

Source: DMSC

4) Review result of reliability of existing data

4-1) Waste generation rate

As the report of AGRESU survey in 2009-2010 is still available, based on this report, it is understood that the survey by AGRESU was planned paying attention to not only urban and suburban areas but also characteristic of bairros located in these two areas. It is evaluated that the survey areas were carefully selected so that the result could represent the values at the time. As for waste survey in 2001 conducted for M/P, because information on the survey is very limited, it is not easy to evaluate its reliability actually. However, in comparison of these results including the survey conducted in the project as shown in Figure 2.3, the value of generation rate in urban area in 2001 seems rather high while the value of urban area in 2009 and 2010 is also more than 1kg/capita/day. The trend of decreasing generation rate from 2001, 2010 to 2013 in urban area is not normal considering the achieved development of the city. So there might be some possibility that the value of urban area in 2001 was higher than the regular value at that time. On the other hand, the trend of increasing generation rate in suburban area is reasonable although the value of rainy season in 2013 may be high due to seasonal reason. At the next survey, values from two surveys in 2009/2010 and 2013 can be the base of waste generation rate to grasp and project the tendency of this value of Maputo City.

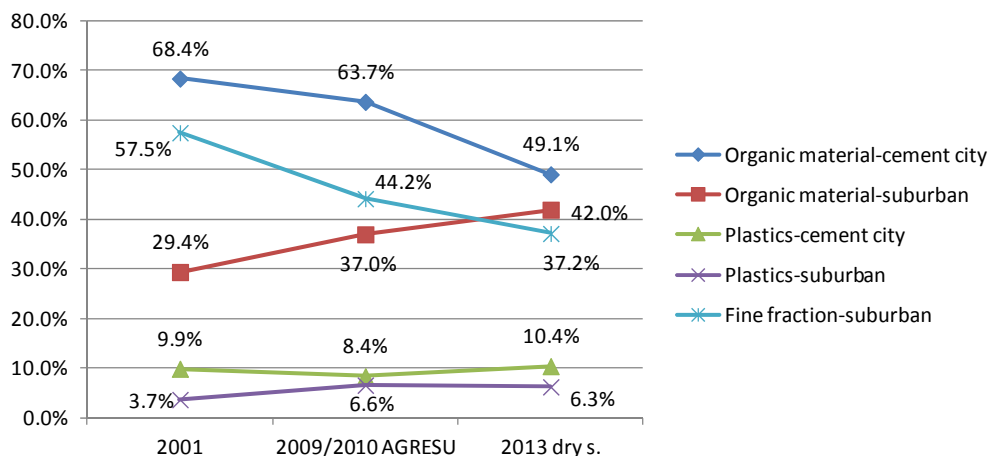


Unit: [kg/capita/day]

Source: DMSC and JICA expert team

Figure 2.3 Comparison of waste generation rate in the surveys**4-2) Waste composition**

The tendency of change in physical composition of domestic wastes is seen from the comparison of available data of the surveys. Figure 2.4 presents the change of major materials in three surveys. While all of these surveys were conducted in only about a week, relation between waste composition, socio-economic condition of society, people's life-style can be reasoned from this graph. Method of waste management should match the quality of waste so that basic surveys should be regularly carried out.



Source: DMSC and JICA expert team

Figure 2.4 Change in physical composition of domestic waste [2001 to 2013]**2.1.3 Update the existing M/P (Activity 1-3)**

This Activity was conducted in the first year of the Project.

1) Method of review and updating of the current M/P

The existing M/P was updated with the following concept shown in Table 2.10, based on the current capacity including the understanding of the M/P of the C/Ps and the progress of current situations examinations. Especially, the current conditions (Chapter 4) and Planning (Chapter 6) were updated by the C/Ps with their positive ownership.

Table 2.10 Basic Concept for the updating of the existing M/P

Chapter	Contents	Basic Concept
1	Summary	Motto and objectives shall be reviewed.
2	Laws and Regularions	Result of current conditions survey shall be reflected.
3	Basic Information of Solid Waste Management	Social and economic indicators shall be reviewed.
4	Solid Waste Management Conditions	The result of updating by the C/P shall be presented.
5	Future Projection	Basically, it shall follow the future projection examined in the current M/P. Tentative summary of the waste survey done during the project shall be also introduced.
6	Planning	The result of updating done by the C/Ps and basic directions to be reflected to the action plan shall be described.
7	Indices and Monitoring	Monitoring of the M/P shall be continued as DMSC has implemented with the indices based on the existing M/P. Action Plans for the following 3 years up to 2017 shall be also proposed.

Source: JICA expert team

Updating was implemented with the following procedures considering the busyness of the C/Ps for their ordinary works and the assignment schedule of the JICA experts.

- As well as updating Chapter 4, the C/P in charge of each section was appointed.
- Each C/P in charge read the contents of their part of the M/P carefully by him/herself in advance, and extracted their ideas on the current contents such as agreed or disagreed points.
- Each expert in charge prepared his/her points of view for the updating Chapter 6 and submitted them to chief advisor.
- Chief Advisor had the meeting with each C/P in charge respectively to discuss about Chapter 6 for updating and the C/P summarized the discussed points.
- C/Ps compiled each discussed point and those were reported and reviewed at the M/P review meetings among all C/Ps, then drafted as an updated plan.
- Draft of updated plan was reported at the review report meeting with the director of DMSC and JICA experts for further discussion, then finalized.
- Unlike updating Chapter 4, review format for updating Chapter 6 was depended on the documentation and presentation capacity of each C/Ps.

1) Updating Points for current situation and planning

Since the existing M/P was prepared in 2007, DMSC has been continuing the monitoring of the plan with the matrix indicators proposed in Chapter 7 of the M/P. Original M/P set the target for only three years, from 2008 to 2010, on each indicator. Therefore, after 2011, DMSC added the target for each indicator considering the progress of activities proposed in the M/P. Some of the C/P who was in charge of this monitoring activities might find some gaps between the M/P and actual conditions but didn't summarized those gaps in appropriate manner and didn't share with other members in DMSC.

Through obtaining the latest information of solid waste management in Maputo city by direct researched by JICA experts or the result of situational survey, it could be said that CMM, or DMSC, had been tackling improvement of solid waste management as proposed in the existing M/P.

For example, the primary collection by the micro enterprises in suburban area was just started at a few birros when the existing M/P was prepared. In the M/P, it was proposed to extend this primary collection system to other bairros and actually DMSC extended to all birros in the suburban area up to the present. In

addition, the cleansing tax (Taxa de Limpeza) has been raised twice according to the M/P to increase the revenue to operate the solid waste management activity but the third of tax increase was not implemented. Therefore, DMSC still need to rely on the external finance such as subsidy of CMM or PROMAPUTO by the World Bank.

On the other hand, in the field of 3R, there were only a few activities related to 3R conducted when the existing M/P was prepared, such as recycling activity by “RECICLA” but it can be observed that many private sectors or NGOs have been participating in the recycling activity.

Unfortunately, however, the plan related to the development of new final disposal site after the existing one at Hulene has not been implemented as proposed in the M/P.

Considering the above, overall updating points for Chapter 4, which is current situations, was the more thorough fact finding through the numerous times of discussions based on the result of situational survey. The C/P is surely understanding the current situations by their usual work experiences but not recognized with the statistical data or number. They are also not familiar to the description of solid waste management conditions at the time of existing M/P preparation. After the review of Chapter 4, the C/P could understand how the solid waste management system was improved since the existing M/P was prepared by their own mind.

The points for updating the planning part of the M/P, which is Chapter 6, is how to recognize the change of circumstances since 2007 when the existing M/P prepared.

Section 6.1 of the existing M/P is the guiding principle for the planning of the solid waste management, indicating the objective of the plan, influencing factors to achieve that objective, fundamental aspects for the planning.

Objective of the plan in the existing M/P is “Increase the quality and the coverage of the cleaning services”. We discussed this objective still would remain as it is to the updated M/P or not. Some C/Ps pointed that “increase the coverage” is not necessary because DMSC had already covered its collection service to all city area. On the other hand, some other C/P argued that this phrase should be remained because Maputo city is still expanding and DMSC should consider the provision of solid waste management services to Catembe and Inhaca. After such dedicated discussions, the C/P concluded that this objective would be remained.

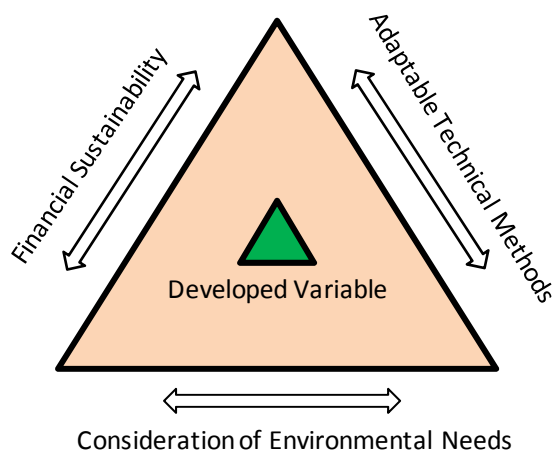
All C/Ps fully agreed to add another phrase related to 3R to the objective of the plan because of the recognition of importance of 3R promotion to reduce the waste amount to be handled by DMSC. As the result of discussion, the objective was updated as shown below.

Increase the quality and range of cleaning services, as well as introduce the 3R policy to reduce the amount of solid waste going to final disposal
--

As for the influencing factors to achieve this updated objective, “Introduction of 3R Policy” was added together with “Efficient and effective institutional management model in order to meet the challenges of solid waste management”.

Furthermore, as the fundamental aspects for the planning, for example, strengthening of the municipal dumping site area and the supervision sector was also proposed to add to increase the revenue of solid waste management.

In the existing M/P, the following figure was illustrated as the symbolic graphic to represent the policy of the M/P. However, it was too difficult for all the C/P to understand the meaning of this figure. Since the C/P agreed that this kind of graphic should be much easier for anyone who read the M/P to understand the concept of the M/P at a glance, new figure will be discussed and proposed in the new M/P updated in the fourth year of the project including the 3R policy.



Source: Existing M/P (2007)

Figure 2.5 Graphical representation of the existing M/P

2.1.4 Develop an Action Plan for the project period (Activity 1-4)

An Action Plan was developed in the first year of the project as this Activity, and the monitoring of the Action Plan was conducted continuously throughout the project period.

1) Preparation of Action Plan

Action Plan is the series of practical plans under the updated M/P which shall be implemented in the following three years after the first year of the project, from 2014 to 2017 up to the project end.

This action plan shall cover the all kind of solid waste management activities although some of those are not covered by the project like the waste disposal plan or organizational improvement.

Considering the limited time for the preparation of action plan because we had taken longer time to review and update the existing M/P based on the current capacity of the C/P, action plan was proposed with the initiative of JICA experts first, then shared with the C/P.

Contents of the action plan were followed to the table of contents of the M/P and several actions to be taken were proposed under each content such as waste removal, treatment and disposal, 3R activities or funding of SWM. Each action also mentions the linkage to the activities under the PDM.

For each action, types of methodology to be used to implement the actions are also proposed as shown below.

- Discussions
- OJT
- Lecture
- Workshop
- Survey
- Field visit
- Outsourcing

Each action also set the goal to be achieved during the project so that no one can lose the objective and direction of the action. The organizations that shall be chiefly in charge of each action are also proposed together with the name of person who will take the initiative in the action.

Responsible organizations for the activity's expenditures were also set so that necessary budget can be prepared efficiently and appropriately in advance. JICA project team will be able to share some of those expenditures but limited.

Schedule of the actions are shown on the action plan sheet depending on the characteristic of each action with three different bars, continuous action, intermittent action and spot action.

This action plan covers all kinds of SWM activities although some of these are not covered by the project like the waste disposal plan or organizational improvement.

After the careful review of the action plan, it was finalized and summary of the plan was presented by Mozambican C/P at the third JCC held on June 9, 2014 for its approval.

2) Monitoring of the action plan

Progress of the activities under the action plan was checked by using the action plan monitoring sheet.

Prior to conduct the monitoring, the action plan monitoring sheet was formulated by adding the input column for assessing the progress of the activities, which is "Planned Status of Activity (A)", "Actual Status (B)", "Name of Monitor (C)", "Result of monitoring (D)", "Reason of Actual Status (E)", and "Necessary Measures to catch up the discrepancy (F)", to the original sheet of the action plan, as shown in Figure 2.6.

For example, three indicates in the column D are set in the following sheet for the result of monitoring, which are "on-time", "delayed", "significantly delayed".

Activities		Monitoring Items						Action Plans														
		A	B	C	D	E	F															
Chapter 1: Policy, Strategy and Basic Principles of Action Plan	Activity 1.1: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
Chapter 2: Organizational Improvement	Activity 2.1: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 2.2: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 2.3: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 2.4: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 2.5: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
Chapter 3: Budget and Financial Management	Activity 3.1: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 3.2: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 3.3: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 3.4: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 3.5: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
Chapter 4: Human Resource Management	Activity 4.1: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 4.2: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 4.3: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 4.4: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started
	Activity 4.5: Develop the action plan for the year 2014 through the JICA project team	Not started	Not started		Not started			Discussions	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started	Not started

Source: JICA expert team

Figure 2.6 Structure of Action Plan Monitoring Sheet (Master Plan)

The first monitoring was conducted in the late September, 2014. At first, the structure of the monitoring sheet was carefully explained by JICA expert to the Mozambican C/P so that the C/P would monitor the progress of activities by them with their initiatives. After this tutorial, an acting manager of Planning and Monitoring Department and a head of Monitoring and Quality Control Section tried to fill the monitoring sheet. This draft monitoring result was reviewed by JICA expert and some comments and suggestions were given to the C/Ps to finalize the sheet.

One of the comments were to clarify the reason of some significantly delayed actions with measures to overcome those delays. Based on this, again, the monitoring sheet was revised through the efforts of the C/Ps to understand the aims of the action plan monitoring. Main reasons why the actions were delayed were, 1) Necessity of the assistance of JICA expert, 2) Unexpected absence of the DMSC staff in charge of, 3) Limited time and lower priority compared to their routine work.

It was originally planned that the monitoring of Action Plan would be conducted every four (4) months, means three (3) times a year. However, as the result, the monitoring was conducted five (5) times only during the project period in, February 2014, February 2015, February 2016, November 2016 and February 2017. The main reason is the difficulties for scheduling for the joint monitoring by the responsible counterpart and the chief advisor.

3) Preparation of section wise draft annual implementation plans

It should be reported a constructive challenge was made by the Mozambican C/Ps that they prepared a draft of the annual implementation plan for the Monitoring and Quality Control Section, following the activities under the action plan and also referring the structure of the action plan.

As indicated in Figure 2.7, a structure of the annual implementation plan of the Monitoring and Quality Control Section consists of activities, sub-activities, name of responsible staff, related stakeholders who might work with, schedules and others, expecting to implement the activities by right persons on right timing.

According to DMSC, this is still just a trial base, but it could be expected to extend to other sections and departments to prepare the similar kind of annual implementation plan.

This challenge can show the result of technical transfer by the project.

Activities		Sub-Activities		Responsible Staff Stakeholders		Schedule												Progress	Remarks
Annual Activity Plan for 2015 from the Monitoring and Quality Control Section (RMCCQ)																			
Activities	Sub-Activity	Responsible	Other stakeholders	January	February	March	April	May	June	July	August	September	October	November	December	Remarks			
Secondary Collection	Monitoring of INCORPUS Works Monitoring of SDAW Works Monitoring of informal collection Works Monitoring of informal collection works	Assimino e Hortência	Camilla, Florência e Sérgio																
Primary Collection	Monitoring of Micro-enterprises units Identification of informal dumping sites	Camilla/Delia/Sémas	Supervision and Office																
Quarterly Reports from GDM and Update of the Matrices	Update and sending of the matrices Elaboration of Quarterly Reports	Florência e Sérgio	Sémas e Hortência																
Participation Reports	Review of past events Elaboration of past events	Sémas	all																
Management of Prehabito Projects	Collection of information about competitors Monitor the Projects Monitor the competition Elaboration of reports on the status of the competitors	Sémas/Florência/Sémas Sémas, Florência, Florência e Lucília Sémas, Lucília e Florência Sémas, Florência, Florência e Lucília	all																
Review of MP	Review of the MP and implementation of Pilot Project (Composting, Collection and Transportation of SDAW)	Assimino/coordenator	all/MP																
General Activity Plan	Monitor the realization of activities of the monitoring section Make backup of all available information	Sémas	all																
Data base	Update the activities in the computer Periodic maintenance of computers	Sémas	Sémas																
Sanitary Landfill / Phases Municipal Dumping Site	Technical support in matters of the Dumping site closure Technical support in matters of the landfill (the sanitary landfill) Identify the recycling companies in Maputo and Matola Identify the recycling companies in Matola and Matola	Camilla/Sémas/Assimino	all																
Civic Education	Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola	Camilla/Lucília	Florência/Sémas/Sémas																
Waste pickers	Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola	all	all																
Extension/Technical Support	Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola	all	all																
Management of the MOC's Activity	Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola	all	all																
Regional Seminar on CSWMS in São Paulo	Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola Identify the recycling companies in Matola and Matola	all	all																
If New Activities Assigned to the Civic Education Office																			
Discontinuing Activities (Any sector may carry out)																			

Source: DMSC and JICA expert team

Figure 2.7 Structure of Action Plan Monitoring Sheet (Monitoring and Quality Control Section)

2.1.5 Develop a guideline of SWM for Maputo City (Activity 1-5)

This activity was conducted during the third and fourth year of the Project.

The solid waste management guidelines was jointly developed by the C/Ps and JICA expert team, utilizing result of the activities regarding the output 2 to 4 which were done through the first to the third year of the Project. The guideline can be considered as a basic information for developing a draft of M/P in the activity 1-6 and official documents of CMM.

As the activities in the third project year, it was agreed that the solid waste management guideline could be separated as a set of four volumes, and contents of each volume were proposed as shown in Table 2.11.

Table 2.11 SWM Guidelines to be Developed during the Project (Draft)

Name of Guideline (Draft)	Contents
Guideline for M/P Revision for SWM	Survey on current status (Waste quantity and composition survey, future prospects), Revision of M/P and guidelines, Monitoring of action plan
Guideline for Solid Waste Collection and Transportation	Checklist for collection equipments, Checklist for operation of collection by private contractors, Training plan of CMM, Contract management
Guideline for Financial Management for SWM	Organization of revenues and expenses, Budget planning process, Estimation of waste treatment unit cost, Development of annual financial report, Training plan of CMM
Guideline for 3R Introduction	Considerations for 3R promotion policies, Considerations for civic education activities, Explanation for waste generators, Training plan of CMM

Source: JICA expert team

In the fourth year of the Project, following the contents of each guideline above mentioned, more detail consultations were made for each guideline. As the result, another guideline for the segregated solid collection in the suburb was separated from the solid waste collection and transportation. In addition, a guideline for promotion of civic education activity was also separated from the guideline for Introduction of 3R Activities. In total, SWM guideline was developed as a set of six volumes.

Each volume of the guideline was drafted by JICA Expert Team with the occasional consultations with C/Ps, then finalized by reflecting the comments from C/Ps. Each volume of guideline was compiled in one document and accepted to the City Councilor in charge of SWM in the CMM at the time of March 2017. Table 2.12 shows the table of contents for the final version of SWM guidelines.

Table 2.12 Table of Contents of Final Version of SWM Guidelines

Title of Each Guideline	Contents of Each Guideline
I_Preparation of the Master Plan for the Integrated Management of Municipal Waste	Chapter 1 Background and Objective of the Guideline 1.1 Background 1.2 Objective of the SWM Master Plan Guideline Chapter 2 Necessity of Solid Waste Management Master Plan 2.1 National Level 2.2 Municipal Level Chapter 3 Structure of the SWM Master Plan Chapter 4 Procedures for Master Plan Preparation 4.1 Timing of Master Plan Preparation 4.2 Check and Review of Master Plan (Monitoring) 4.3 Major Points to be clarified 4.4 Development of Master Plan 4.5 Approval of Master Plan
II_Improvement of Waste Collection and Transportation in the Urban Area	Chapter 1 Objectives of Guideline Chapter 2 Three key factors Chapter 3 Steps of cycle of Improvement 3.1 Information from Stakeholders 3.2 Analysis of collected information 3.3 Intervention and evaluation 3.4 Improvement on interventions
III_Introduction of Segregated Waste Collection in the Suburb	Chapter 1 Current Situation of Primary Collection 1.1 Overview of primary collection 1.2 Waste generation in suburban areas 1.3 Potential of recyclable collection/recovery in suburb Chapter 2 Planning of Segregated Waste Collection 2.1 Selection of target area

Title of Each Guideline	Contents of Each Guideline
	2.2 Selection of target recyclable item 2.3 Arrangement for segregated collection 2.4 Implementation schedule Chapter 3 Preparation of Segregated Waste Collection 3.1 Trial of segregated waste discharge 3.2 Training for collection workers 3.3 Dissemination to residents 3.4 Intervention to induce segregated waste discharge Chapter 4 Implementation and Monitoring of Segregated Waste Collection 4.1 Monitoring of collected recyclables 4.2 Monitoring of revenue by selling recyclables 4.3 Monitoring of implementation cost 4.4 Monitoring of intervention cost Chapter 5 Evaluation of Segregated Waste Collection 5.1 Cost-effectiveness of segregated waste collection 5.2 Cost-effectiveness of interventions 5.3 Unit cost of conventional waste treatment Chapter 6 Recommendation for Segregated Waste Collection
IV_Financial Operations for the SWM of Maputo City	Chapter 1 Operational Structure 1.1 Current Financial Operations Structure 1.2 New Financial Operations Structure Chapter 2 Budget Planning 2.1 Objectives 2.2 Budget Planning Procedure Based on Objectives Chapter 3 Budget Operations 3.1 Goods and Services Acquisition: Timing and Model 3.2 Payments Using Permanent Funds and Consigned Funds to Suppliers and Service Providers Chapter 4 The Special SWM Fund Account Chapter 5 Revenue Generation and Collection 5.1 Domestic Cleaning Fee 5.2 Non-Domestic Cleaning Fee 5.3 Contract Fee 5.4 License Fee 5.5 Hulene Dumping Fee/Tipping Fees (New Sanitary Landfill) 5.6 Fines and Penalties 5.7 Special Services 5.8 Other Income Chapter 6 New Method of Collecting the Cleaning Fee Chapter 7 Auditing
V_Introduction of 3R Activities	Chapter 1 Grasping Current Situation of Recycling Network 1.1 Identification of recycling entities 1.2 Confirmation of handling items and their volume 1.3 Confirmation of where to obtain & where to deliver recyclables 1.4 Confirmation of purchasing & selling price of recyclables 1.5 Periodical information update 1.6 Examination of intervention to promote recycling Chapter 2 Introduction of Valuables Recyclables recovery in the Suburb

Title of Each Guideline	Contents of Each Guideline
	2.1 Planning of Valuable Recyclables Recovery 2.2 Preparation of Valuable Recyclables Recovery 2.3 Implementation and Monitoring of Valuable Recyclables Recovery 2.4 Evaluation of Valuable Recyclables Recovery 2.5 Recommendation for Valuable Recyclables Recovery Chapter 3 Introduction of Household Organic Waste Recycling in the Suburb 3.1 Planning of Household Organic Waste Recycling 3.2 Preparation of Household Organic Waste Recycling 3.3 Implementation and Monitoring of Household Organic Waste Recycling 3.4 Evaluation of Household Organic Waste Recycling 3.5 Recommendation for Household Organic Waste Recycling
VI_Promotion of Civic Education Activity	Chapter 1 Basic Concepts for the Elaboration of the Guidelines 1.1 Criteria for preparing the Guidelines of Civic Education 1.2 Focusing on the implementation of stipulations on legal framework 1.3 Identification of Stakeholders and defining collaboration mechanism schemes 1.4 Identification of critical issues and definition of prioritizing criteria 1.5 Problem analysis 1.6 Analysis of possible solutions 1.7 Definition of priorities Chapter 2 Guidelines for Civic Education in regard of Solid Waste Management and Introduction of 3R Concepts 2.1 Program 1: Introduction of 3R concepts at educational institutions 2.2 Program 2: Public awareness campaigns in critical locations 2.3 Program 3: Implementation of 3R promotion activities

Source: JICA expert team

2.1.6 Set a target of SWM for post-termination of the Project and develop a draft of M/P. (Activity 1-6)

This activity was conducted during the third and fourth year of the Project.

As for the activities related to the development of M/P in the third year of the project, most of the activities were spent to develop the draft of Table of Contents of M/P.

Referring to the Table of Contents of the current M/P developed in 2007 with the technical assistance of GTZ (now changed to GIZ), the C/Ps and JICA Expert Team discussed about the necessity of modification of contents for the revised M/P to be developed in the fourth year of the Project. In addition, the experiences obtained in the first year's activities of the Project which was the minor modification of the current M/P, especially the identification of the gaps between the description of the current M/P and an actual situation and a new direction in the future plan discussed in the first year.

We have agreed on that the new contents shall cover more about 3R activities, both the current situations and future plans, to reduce the amount of waste to be transported and disposed of by CMM. It was also proposed that the latest plan of the construction of a new landfill in Matlhamelo, Matola Municipality shall be described because the engineering works, mainly preparation of basic conditions, concept, and design works had been started with the assistance of the Export-Import Bank of Korea.

The target years to be covered by the M/P was also agreed on for ten years after completion of M/P as well as the existing one, that is from 2017 to 2027.

Upon above described concept, in the fourth year of the Project, the draft of revised M/P was developed following with the finalized Table of Contents show in Table 2.13, referring the contents of SWM guidelines which are previously mentioned.

Table 2.13 Table of Contents of Revised M/P

Chapter		Contents
Executive Summary		Executive Summary
1	The Master Plan	1.1 Vision 1.2 Objectives 1.3 Framework and legitimation 1.4 Structure and Script for the Master Plan
2	Legal Context of Urban Solid Waste Management	2.1 Legal background 2.2 Regulatory authority 2.3 Legal framework 2.4 Summary of the key legal devices 2.5 Conventions
3	Basic Information on the Management of Municipal Solid Waste	3.1 Historical summary of Maputo 3.2 Administrative description 3.3 Geographical and climatic description 3.4 Economic description 3.5 Infrastructure description 3.6 Demographic and urban description 3.5 Description of Municipal Solid Waste 3.6 Production and composition of MSW in Maputo
4	Current Management of MSW in Maputo	4.1 Organizational structure of the Municipal SWM 4.2 Budget and financial management 4.3 Waste collection and transportation 4.4 Treatment and final disposal 4.5 Participation of the private sector 4.6 3R Activities in Maputo City and recycling activities 4.7 Civic education on 3R 4.8 Analysis of the current situations
5	Projected Quantities of Municipal Solid Waste 2017 – 2027	5.1 Population 5.2 Economic Growth 5.3 Forecast of the production of MSW in Maputo
6	Fundamental Direction of Master Plan	6.1 Principles 6.2 Institutional and organizational development 6.3 Collection and transportation of MSW 6.4 Treatment and disposal of MSW 6.5 Promotion of 3R activities 6.6 Civic education and citizen's sensitization 6.7 Funding of the MSW management 6.8 Implementation schedule
7	Monitoring of Master Plan	7.1 Introduction 7.2 Consideration of Sustainable Development Goals (SDGs) 7.3 Monitoring indicators and targets (2017 – 2021) 7.3 Monitoring Matrix

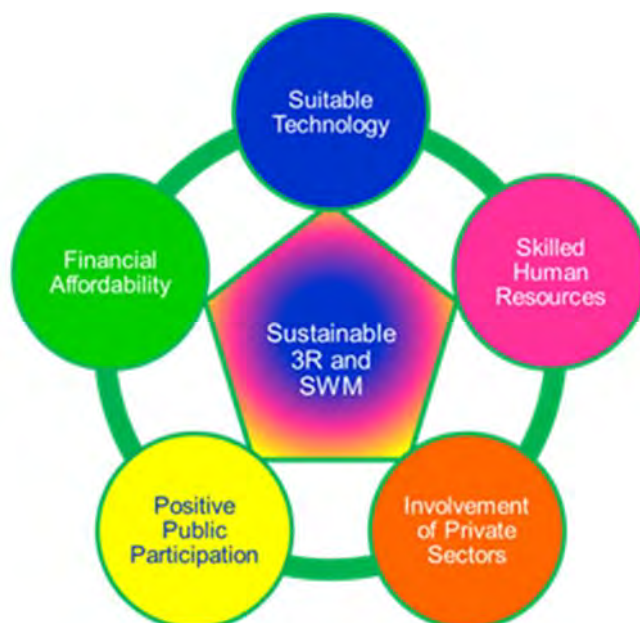
Source: JICA expert team

As well as the Solid Waste Management Guideline, Master Plan was drafted by JET having the discussion with the C/Ps occasionally and chapter by chapter. Then, the draft was carefully reviewed by the C/Ps. Review results were reflected to finalize the Master Plan.

Especially, Chapter 4 of the Master Plan, which is the part of current conditions of the solid waste management, was prepared by the C/Ps on their own initiative, with the workshop meetings for the analysis of strengths, weakness, opportunity and threat of the current situation. Based on the result of analysis, detail plans were proposed by each individual category in Chapter 6.

In addition, five approaches, called “Pentagon Approach”, were adopted to develop the sustainable master plan including “3R concept”, which are 1) Skilled Human resources, 2) Suitable Technology, 3) Involvement of Private Sectors, 4) Positive Public Participation and 5) Financial Affordability, as shown in Figure 2.8. As of March 2017, the final draft of the Master Plan is under review by City Councilors and other relevant officials of the CMM.

A part of the executive summary of the master plan is attached below.



Source: JICA expert team

Figure 2.8 Pentagon Approach for Sustainable 3R and Solid Waste Management

1) Vision and Objective

1-1) Vision

Clean and Sustainable City, Maputo, with 3R

1-2) Objective

To designate the appropriate technical direction of the SWM and 3R for better and sustainable urban environment and living conditions.

2) Analysis of Current Situations

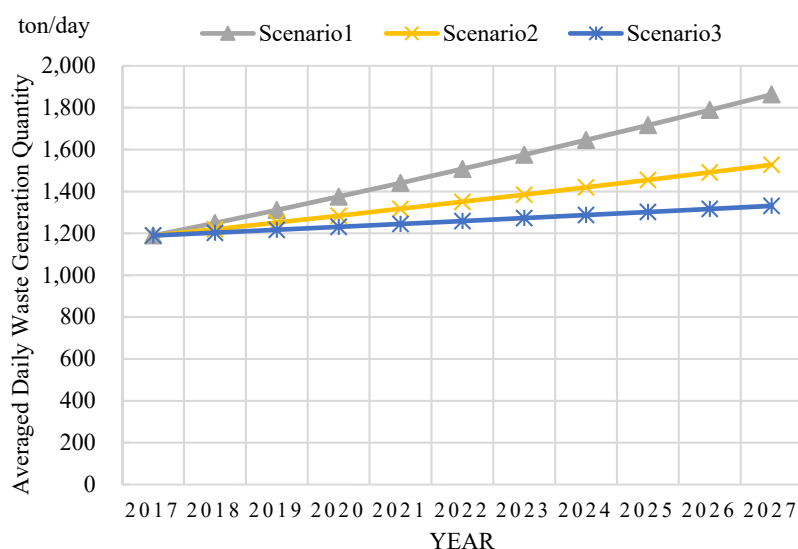
After the careful review and analysis, current situations of the municipal solid waste management in Maputo City were summarised with its strength, weakness, opportunity and threat as shown below.

	Positive Strengths	Negative Weaknesses
Internal	Improved SWM capacities Improved individual SWM skills Work experiences complying the previous M/P Establishment of Civic Education Office Monitoring system with public and private participation like MOPA Internal revenue system through EDM, Proof of Service and others Good relationship with MITADER, FUNDS, Matola City on the new landfill development Human network on SWM within and out of countries	Not enough SWM capacity to overcome the current problems Unsuitable equipment conditions for DMSC's SWM operation Uneven motivation to SWM works of DMSC staff Insufficient information sharing system in DMSC/CMM Less experiences on the contract management to the complicated contract with private sectors Financial vulnerability on SWM activities Less understanding of residents and businesses on SWM and 3R
	Opportunities	Threats
External	Technical Support on SWM by international donors and NGOs, including trainings Establishment of FONGER, national solid waste manager's forum Participating in the SWM market by domestic and international private sectors Development of new treatment technologies of solid waste in feasible manner	Increase of population due to rapid urbanization Increase of SWM cost due to operation of new sanitary landfill and 3R introduction Termination of financial support by PROMAPUTO Slumping of recycling market Lack of related regulations on 3R

Source: JICA Expert Team

Figure 2.9 Summarized Current Conditions of Municipal Solid Waste Management**3) Projected Quantity of Municipal Solid Waste**

Considering the population growth and economic growth in future in the CMM, quantity of the municipal solid waste for the target period of this Master Plan, from 2017 to 2027, was projected based on the actual quantity data obtained and analyzed during JICA 3R Project. The following projection shown in Figure 2.10 was calculated with three scenarios, high, mid and low, with the different assumptions of waste generation rate and growth rate. Table 2.14 shows the case of scenario 2 and it estimates approximately 1,528 tons of municipal solid waste will be generated in Maputo City per day, which is 1.5 times more than that in 2017.



Source: JICA Expert Team

Figure 2.10 Projection of Daily Generated Quantity of Municipal Solid Waste

Table 2.14 Projection of Daily Generated Quantity of Municipal Solid Waste (Scenario 2)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Urban area	101	102	104	106	107	109	110	112	113	115	116
Suburban area	679	700	721	742	764	786	808	831	854	877	901
KaTembe	11	11	13	14	16	17	19	21	22	24	25
Inhaca	2	2	2	2	2	2	2	2	2	2	2
Sub total	794	816	840	864	888	913	939	965	991	1,018	1,045
Markets and fairs	95	97	99	101	103	105	107	109	111	114	116
Commercial	78	79	81	82	84	86	87	89	91	93	95
Public cleaning	24	24	25	25	26	26	27	28	28	29	29
Green waste	40	41	42	42	43	44	45	46	47	48	49
Bulky waste	13	13	14	14	14	14	15	15	15	16	16
Construction	67	68	70	71	73	74	75	77	79	80	82
Industrial	79	81	83	84	86	88	89	91	93	95	97
Sub total	396	404	412	420	429	437	446	455	464	473	483
Total [ton/day]	1,190	1,220	1,252	1,284	1,317	1,351	1,385	1,420	1,455	1,491	1,528

Source: JICA Expert Team

4) Remarkable Points of Master Plan

The followings are the remarkable points to be taken during the period that this Master Plan covers.

4-1) Updating the Master Plan and Action Plan

Master Plan shall be firstly updated by the end of 2021, then fully revised as a new Master Plan (2027 - 2036) by the end of 2026.

4-2) Reorganization of DMSC

It is expected to establish that the part of DMSC which is dedicated to SWM is separated from the area which manages cemeteries, including the renovation of DAF during the time from 2017 to 2018. Capacity development for DSMC staff including giving the training opportunities shall be conducted continuously.

4-3) Collection & Transportation

It shall be recognized for the increase of the transportation cost when the new sanitary landfill will be started its operation, hopefully in 2020. At this time, waste collected in Katembe area might be transported to the new landfill via crossing Katembe bridge. In urban area, door to door collection by compacter track shall be expanded from 2022.

4-4) Waste Treatment and Disposal

As previously mentioned, the new sanitary landfill is expected to start its operation in 2020. Right after its commencement, the CMM shall start to prepare the development plan and works for the second phase of the landfill. Hulene dumping site is expected to be closed with appropriate manner at least by 2022. It is recommended that introduction of new waste treatment system shall be studied carefully only after verifying the situation of the actual waste operation of the new landfill.

4-5) 3R Promotion

Proposed 3R promotion activities shall be carefully continued with their expansion step by step. Segregated waste collection system in sub-urban area shall be introduced from 2022 when this Master Plan will be reviewed for minor updating.

4-6) Civic Education

As well as 3R promotion, introduction of 3R principles in teaching institutions shall be carefully continued step by step together with public sensitization campaigns. Other proposed activities such as educational campaigns for all residents shall be introduced during the stage of updated Master Plan from 2022.

4-7) Financial Management

Most critical actions related to the financial management is to clarify the necessary cost for the operation of the new sanitary landfill including the increase of transportation cost. Then it shall be determined how the CMM increase the revenue to cover these increased costs.

Figure 2.11 shows the projected cost and revenue curve up to 2027. It is clearly observed the total cost for the solid waste management will be significantly increased when the operation of the new landfill will start in 2020. Since the revenue expected to obtain under the current cleaning fee rate can not cover this increased cost. Therefore, the CMM shall consider to subsidy this increment cost or to increase the cleaning fee rate at least three times during this Master Plan period.

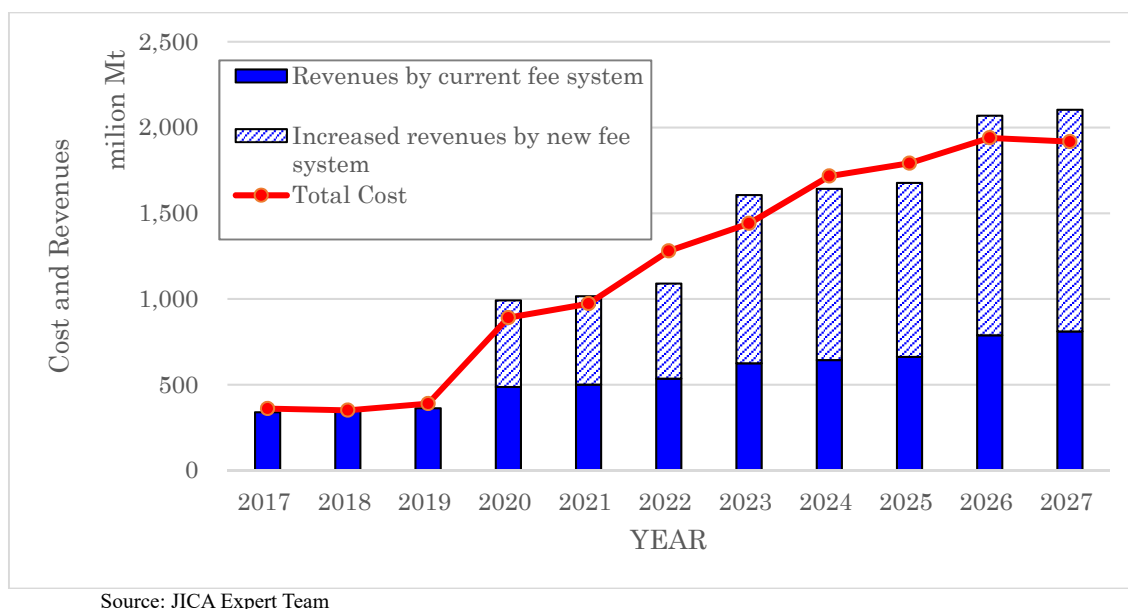
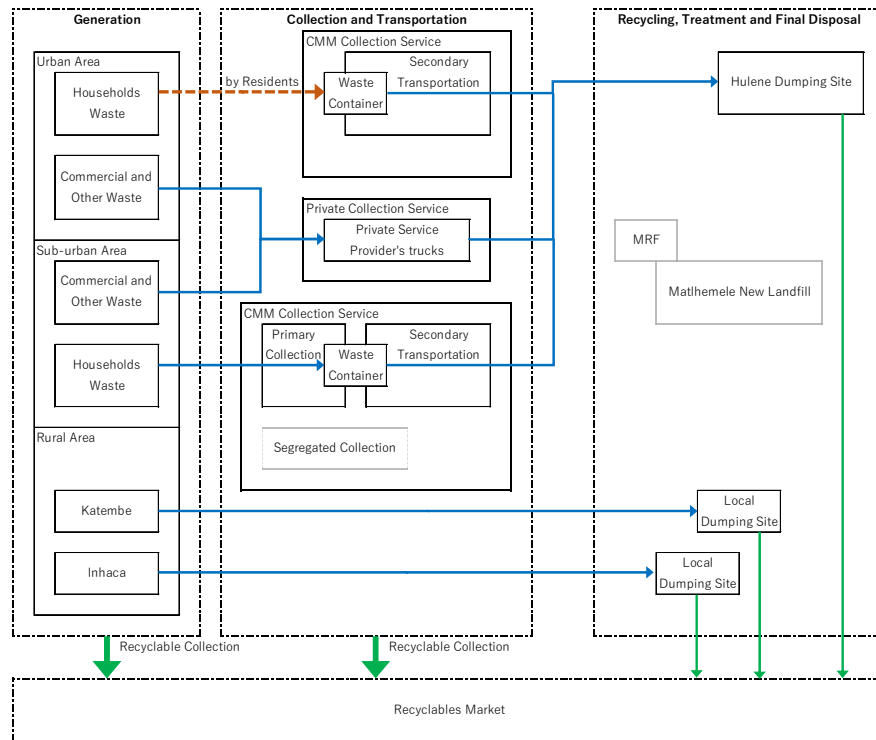


Figure 2.11 Projected cost and revenue related to the solid waste management

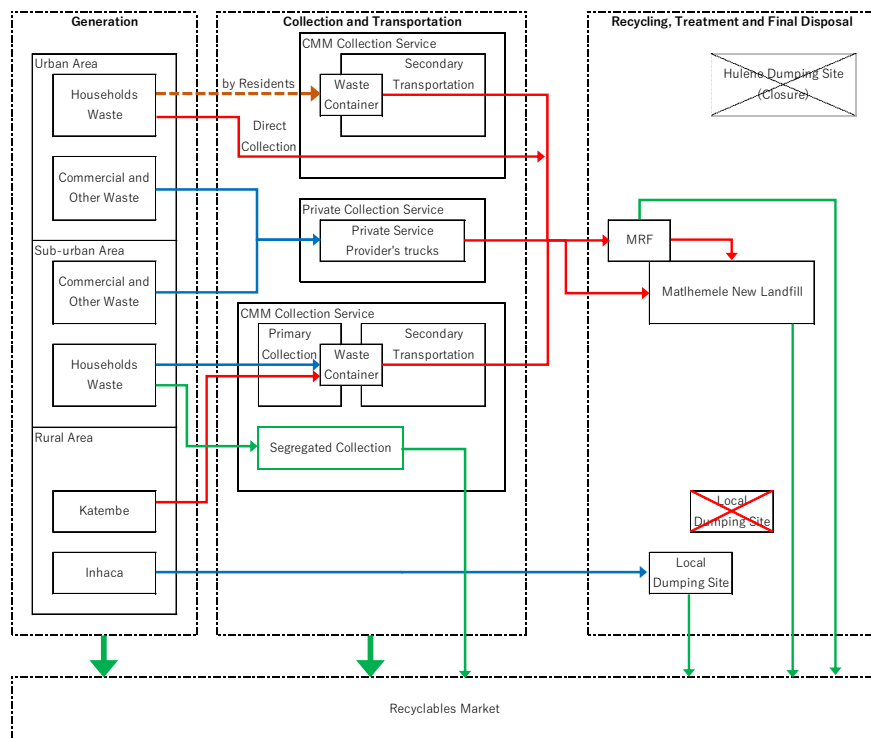
5) Waste Flow

The following figures show the waste flow from the generation source to the final disposal site through the collection and transportation in 2017 and 2027.



Source: JICA Expert Team

Figure 2.12 Waste Flow in 2017



Source: JICA Expert Team

Figure 2.13 Waste Flow in 2027

6) Monitoring of Master Plan

Monitoring of this Master Plan shall be conducted with the indicators for measuring the achievement of implementation of the actions comparing the targets set in the Master Plan

All responsible bodies for implementing the Master Plan, which are mainly under DMSC, must ensure the achievement of targets, through their action plan and operational plan. It is also responsible for DMSC to monitor all indicators and to submit reports stating their progress, following to the agreed deadlines, to the Municipal Council for proper approval.

2.1.7 Develop the Action Plan toward 2021 (Activity 1-7)

According to the contents of the revised Master Plan, the Action Plan was also developed for the target period, which is the first 5 years of the Master Plan period, means up to 2021. The Action Plan is attached to the Master Plan as its annex.

The structure of the Action Plan is following to the previous Action Plan during the project prepared in the first project year. Target actions in the Action Plan are the proposed individual actions in each contents of the Master Plan, which are waste collection and transportation, treatment and disposal, 3R introduction, and financial management for the solid waste management, including the format for the monitoring.

2.2 Activities for Output 2

2.2.1 Review the situation of waste collection and transportation (Activity 2-1)

At the beginning of the project period in 2013, the situation of waste collection and transportation was reviewed and understood for considering the detailed activities for Output2 of the project. The review was conducted through collection of relevant information and the discussion among the project team, also field visit and field surveys including Time and Motion survey in dry and rainy season and the situational survey conducted by the subcontractor in order to update the situation of waste collection and transportation in Maputo City.

The update of the latest information was continued since then, because there were several significant changes in the situation mainly because of the new contract for waste collection in urban area.

1) Situation in February 2014

After the formulation of the previous M/P in 2007, DMSC of CMM have continued great effort for expanding the waste collection coverage and service to their citizens. The primary collection in suburban area has been expanded to all 43 bairros in 2011. Table 2.15 summarizes the waste collection and transportation system in Maputo City in February 2014.

Table 2.15 Waste collection and transportation system in Maputo City [as of Feb. 2014]

	Collection method	Discharge place	Collector responsible	Equipment
Urban area				
[collection and transportation to dumping site]	Deposit station	Waste container [1.1m ³ , 6m ³ , 5m ³]	Big contractor	Compactor truck
Suburban area				
[primary collection]	Door to door	Rice bag	Micro enterprises	Push-cart
[secondary collection]	transportation of container to dumping site	Waste container [12m ³]	Big contractor	Roll-on truck
Large waste generator [>25kg/day]				
Entire city	Collection at waste generator	Individual waste container	DMSC or registered private collector	Compactor truck, flat truck

Note: Urban area is the municipal district of KaMpfumo. Suburban area consists of other 4 municipal districts, i.e. Nhamankulu, KaMaxaquene, KaMavota and KaMubukwana.

Source: DMSC, CMM

1-1) Urban Area

A private company, Enviroserv, was engaged in waste collection and transportation in urban area about 2 years by temporal contract since the end of the previous contract period of different contractor. It was observed in the first half of 2013 that wastes remaining in urban area increased and unsatisfactory due to nonreplaced heavily damaged containers which caused the loading work very hard and long time, which then resulted in incompleteness of collection of all waste deposited into the containers.

After certain period of serious condition of waste collection in urban area, the new contract was approved by CMM on 4th June 2013. The contract period was set as 5 years which was same as the previous contract. Then, the contractor started mobilization of equipment including waste collection vehicles and containers. On 10th October, 4 months after the contract signing, the ceremony of commencement of operation by new contractor, Eco Life, was held at the City Hall of CMM. In the contract, all regular waste collection works except special collection by CMM was transferred to the responsibility of the contractor. The demarcation of collection routes between the contractors and DMSC in the contracts is shown in Table 2.16.

Table 2.16 Responsibility of waste collection by collection route in Urban area

	Previous contract (2006-2011)	Temporal contract (2011-2013)	New contract (2013-2018)
Contractor	4	3	6
DMSC	2	3	0

Source: DMSC, CMM

1-2) Sub Urban Area

There are 43 neighborhoods (bairros) in the suburban area, except Katembe and Inhaka, of Maputo City of which average area is about 3 km² and average population is about 20,000 persons, and DMSC currently entrusts 37 micro-enterprises (MEs) for operating primary collection in the suburban area as of 2014.

For daily collection works, in many cases, each bairro is divided into 3 zones (service areas) and MEs collect waste from the households in each zone twice a week. Generally, the collection work is conducted from 6 a.m. to 2 p.m. from Monday to Saturday. The collection workers visit households and collect their waste by waste carts called “tchovas.” The collected waste is unloaded at designated waste containers [12m³] and one big contractor, Enviroserv, is in charge of transporting the waste to Hulene Dumping Site as secondary collection. Enviroserve replaces the container filled with solid waste by the empty containers. In principle, one hundred forty numbers of containers are being replaced daily base.

Primary collection by MEs had been expanded since the privatization of waste collection and expansion of waste collection coverage was intended in the previous M/P. The history of increased contract with MEs is shown in Table 2.17. The service was expanded to a neighborhood of Katembe in 2016.

Table 2.17 Increased contract with microenterprises for primary collection

Year	2008	2009	2010	2011
Contract with Microenterprise	18	19	25	43

Source: DMSC

1-3) Collection by DMSC

A part of waste collection works of DGRSU of DMSC was transferred to the scope of contractor's work. The DGRSU used to be in charge of one daily collection route. At present, the department is executing collection of special collection of bulky waste, collection based on the contract with waste generators such as public institutions, while it is also operating Hulene municipal disposal site same as before.

In addition, the DGRSU need to take care of illegal dumps at the location without waste containers as well as supplemental works in case that the contractor(s) cannot complete their task. While responsibilities of the department is being reduced, its function of physical works in the city are to be recognized as important.

On the other hand, it is obvious that the CMM has been promoting privatization of their works, like the operation and rehabilitation of Hulene final disposal site, it has been difficult to maintain same level of function of service by the department. Physical assets of DGRSU such as old vehicle and equipment are not replaced.

2) Time and Motion survey conducted in the first project year [2013-2014]

2-1) Background and objective

The time and motion survey is the survey to understand the situation in solid waste collection and transportation. The survey can reveal not only the time required for the waste collection and transportation works but also how the actual condition of workers, vehicles, containers, traffic and citizen's behaviors during the collection hours. This survey was carried out in the first project year as a part of capacity assessment of present solid waste management system in Maputo. The observation in the survey made us to be aware of the difficulties, problems and issues so that we may have chance to consider countermeasures for improvement of the present performance.

2-2) Method of survey

The survey was conducted for all equipment used for waste collection and transportation except special collection which is occasionally carried out according to the needs of waste generators.

The survey is conducted in the following sequences.

- The surveyors prepare the survey sheet, GPS unit and a stop watch.
- The surveyors follow waste collection equipment from the beginning to the end of the collection work
- The surveyors record the departure time and arriving time at each waste collection location such as location of containers in case of urban area, secondary transportation in suburban area, and houses in case of primary collection in suburban area. The surveyors also record time required for transportation and waste loading and unloading at the dumping site. Other items to be recorded is number of workers, number of containers, driving miles between collection points etc.

2-3) Survey schedule

The survey was conducted in dry season and rainy season as shown in Table 2.18. Because the contractor for urban area was changed after the survey in dry season, the survey in rainy season was conducted after the work by the new contractor, Eco-Life, had seemed to be going as a routine.

Table 2.18 Implementation days of Time & Motion survey

	Dry season			Rainy season		
	Entity [route]	Date	Survey hour	Entity [route]	Date	Survey hour
Urban area						
Road side container collection	Enviroserv [Route 3]	18 and 21 June, 2013	Night	Eco-Life [Route 1]	25 and 27 January, 2014	Night
	Enviroserv [Route 4]			Eco-Life [Route 2]		
	CMM [Route 1]	27 and 29 June, 2013		Eco-Life [Route 3]	26 and 29 January, 2014	
	CMM [Route 2]			Eco-Life [Route 4]		
					Eco-Life [Route 5]	
Plastic bag collection	CMM	20 and 30 June, 2013	Day hour	Eco-Life [Route 6]	31 January, 2014	
Suburban area						
Secondary collection	Enviroserv [Route 33]	19 and 22 June, 2013	Night	Enviroserv [Route 33]	28 January, 02 February, 2014	Night
	Enviroserv [Route 44]			Enviroserv [Route 44]		
Primary collection	ME for Xipamanine	24 and 28 June 2013	Day hour	ME for Xipamanine	30 January, 01 February, 2014	Day hour
	ME for Magianine	24, 28 June, 2 July, 2013		ME for Magianine	01 February, 2014	
	ME for 25 de Junho	24 and 28 June, 2013		ME for 25 de Junho	30 January, 01 February, 2014	

Source: DMSC and JICA expert team

2-4) Summary of survey result

The performance of new contractor brought about significant difference of waste collection and transportation in urban area. The time spent for waste loading to the collection vehicle was reduced. The working hours a day per route has been shortened while the number of containers emptied increased. It means that more containers could be emptied in shorter time at the rainy season compared to the dry season.

In suburban area, it was observed that primary collection was obliged to suspend because of delay in secondary transportation execution. Also, the primary collection was affected unavailable local road due to rain. The summary of result is shown in Table 2.19.

Table 2.19 Summary of results of Time & Motion survey

[Urban area]

Survey season [Entity]	Number of collection point	Hour spent for work (hh:mm)	Loading time (hh:mm)	Transportation time (hh:mm)	Transportation distance (km)
Road side container collection					
Dry season [Enviroserv]	25	11:56 100%	9:21 78%	2:35 22%	42.3
Dry season [CMM]	19	5:29 100%	4:04 74%	1:25 26%	29.7
Rainy season [Eco-Life]	62	6:48 100%	4:35 67%	2:13 33%	44.3
Plastic bag collection					
Dry season [CMM]	138	4:09 100%	1:52 45%	2:16 55%	25.4
Rainy season [Eco-Life]	330	5:35 100%	2:13 40%	3:22 60%	-

[Suburban area]

	Collection point	Hour spent for work (hh:mm)	Loading time (hh:mm)	Transportation time (hh:mm)	Transportation distance (km)
Secondary collection					
Dry season [Enviroserv]	14	11:13 100%	6:36 59%	4:36 41%	184.3
Rainy season [Enviroserv]	9	8:54 100%	2:55 33%	5:59 67%	110.2
Primary collection					
Dry season [MEs]	35	4:42 100%	2:20 50%	2:21 50%	6.3
Rainy season [MEs]	24	2:26 100%	0:52 36%	1:34 64%	3.7

Note: Figures of percentage indicate ratio of time distribution for loading work and transporation.

Source: DMSC and JICA expert team

2-5) Observations by survey supervisors of DMSC

The supervisors of DMSC who participated in the survey noticed various observations as described in Table 2.20.

Table 2.20 Observations by DMSC supervisors in Time & Motion survey

		Dry season	Rainy season	Difference in two seasons
Urban area	DMSC, CMM	<ul style="list-style-type: none"> -Frequent mechanical and hydraulic problem -Damaged container with damaged wheels delayed loading work -Collection workers were not enough to complete the scheduled waste collection due to the problems mentioned above. 	No collection by CMM	---
	Contractor	<ul style="list-style-type: none"> The Contractor: Enviroserv -Damaged container with damaged wheels delayed loading work -Some containers are not effectively placed due to the restriction of available space along the road. 	<ul style="list-style-type: none"> The Contractor: Eco-life - The reviewed routing resulted in that some route was longer than others. -Green waste such as branches disturb waste collection work. This kind of waste is not responsibility of the contractor but responsibility of CMM. This type of waste requires the workers to load waste to collection vehicle manually. -Before the vehicle become full of waste, another vehicle is waiting at middle of the collection route to minimize the time required to complete one route. 	<ul style="list-style-type: none"> - Eco-Life has replaced old equipment by new waste containers and waste collection vehicles, which resulted in significant improvement in terms of time spent for the collection. - Eco-Life reviewed and adjust the routing of waste collection. The area of plastic bag collection is incorporated with another route. -In case vehicle of Eco-Life can not finish the planned route, they send another vehicle about 7am to supplement the remaining containers.
Suburban area	Primary collection	<ul style="list-style-type: none"> -Sandy ground makes collection by push-cart very hard. -Collection workers were not enough. They sometimes cannot complete the scheduled waste collection -Once the push cart has damage and cannot be operated, the collection was suspended because they do not have a spare of push cart. 	<ul style="list-style-type: none"> -Sandy ground was compacted by rain so that moving push cart was easier than dry season. -Some local road was blocked by influence of rain. -Same problems with number of workers and push cart were observed again same as dry season. 	<ul style="list-style-type: none"> -Because of influence of rain, the transport of push cart is easier in rainy season although another problem, blockage of the local route was observed. -In general, it is not easy for microenterprises to complete the collection work as scheduled due to waste amount. Delay in replace of waste containers by secondary transportation cause suspended work in primary collection.
	Secondary collection	<ul style="list-style-type: none"> The Contractor: Enviroserv -Frequent mechanical and hydraulic problem -No covering sheet on the waste during transportation so that waste is flown down to the road side. -Damaged containers -Possible improvement is transportation routing 	<ul style="list-style-type: none"> The Contractor: Enviroserv -Conditions are observed same as dry season -Difficulty of access to some containers due to the road condition affected by rain -Difficulty in entry to the dumping site because of influence by rain 	<ul style="list-style-type: none"> -The waste collection and transportation in rainy season was more difficult than that of dry season due to influence of rain.

Source: DMSC and JICA expert team

2.2.2 Develop a plan for a P/P for improvement of waste collection and transportation in urban area (Activity 2-2)**1) Background**

It is planned to conduct two P/Ps as activities for output2 in the project design. One of two P/Ps is that for improvement of waste collection and transportation in cooperation with private sector in urban area. Though it had been scheduled to conduct this P/P in the second project year (2014-2015) in the work plan elaborated at the beginning of the project start, the execution of the P/P was postponed to the third project year.

The performance of the contractor, ECOLIFE, based on the contract signed in 2013 had been evaluated relatively well. Nevertheless, possible measures will be tried and verified in order to reflect such knowledge and experiences in updating M/P because further improvements in waste collection and transportation may be expected.

2) Objectives

The objectives of the P/P are as follows:

- To improve the situation of collection and transportation of solid waste
- To try and verify an intervention of improvement
- To get lesson to be discussed and reflected into updating the M/P

3) Steps to design a pilot project

The flow of designing a P/P is illustrated in Figure 2.14. At first, we have to understand the present situation of the targeted issue. Then, a hypothesis shall be made considering expected improvement of the present situation. This hypothesis is to be verified in the P/P.

To try possible measures which may support the hypothesis, the project framework including the target area, concerned stakeholders/organizations and their functions should be decided. Before the implementation, the necessary resources such as personnel, equipment and materials shall be secured in accordance with the set framework.

4) Existing problems

The existing problems in waste collection and transportation in urban area are analyzed as follows;

- Issues in the sites of waste collection and transportation

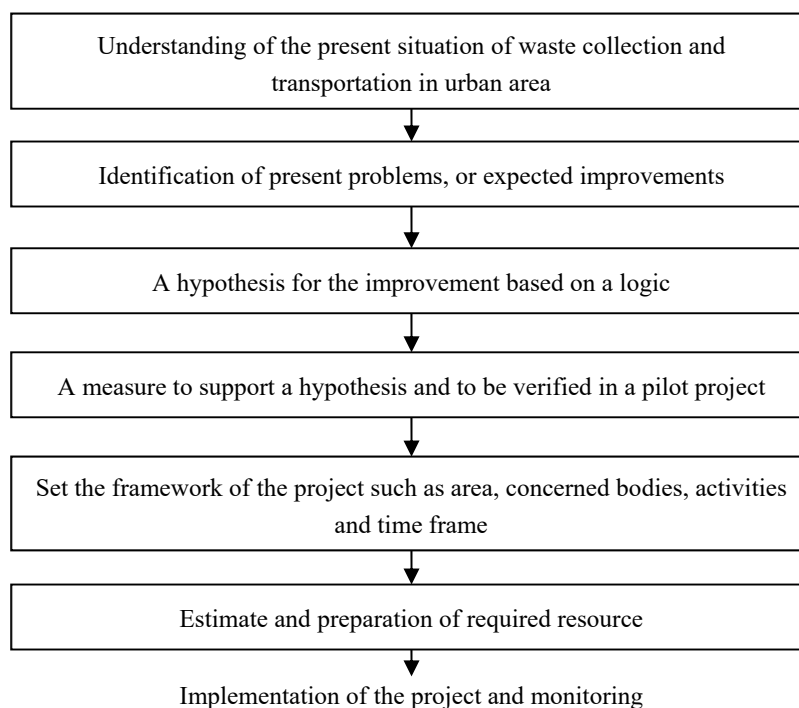
Littered solid waste in the surroundings of some waste containers and streets as the result of the scavenging by waste pickers

Fire in waste containers caused by careless and manner less behaviors of some citizens

Issues in the reporting by the contractor required by the contract

The information and reports about these problems are shared orally on daily basis.

The contractor who goes to waste collection routes and location of containers every day must identify and know the locations where the problems happen. These informations had not been briefly written in the weekly report by the contractor, and not delivered to the directorate daily.



Source: JICA expert team

Figure 2.14 Work Flow to develop a plan of pilot project

5) Design of the pilot project

5-1) Hypothesis

The hypothesis shown below is to be verified in the P/P;

“Reinforcing the coordination among sections and contractors to utilize the existing information would enhance actions for improvement.”

5-2) Existing information and those utilization

The supervision section in DPM and the contractors, that are the ECOLIFE for urban area and the Enviroserv for the secondary collection of suburban area, identify and own the information of problems in waste collection work. The information reported to DMSC by the contractors is analyzed and necessary actions to solve the problems are taken by DMSC.

However, the contractor for urban area did not report to DGRSU but to DPM only. That reported information was shared among the departments only at the DMSC weekly management meeting on every Mondays. The DPM checked if the information from the supervision section and the weekly as well as monthly report from the contractor is same, and if the contractor performs as required by the contract, which is the primal purpose of the DPM. Therefore, it should be discussed how to make use of the information from field to analyze the necessary actions for improvements.

5-3) Interventions in the pilot project

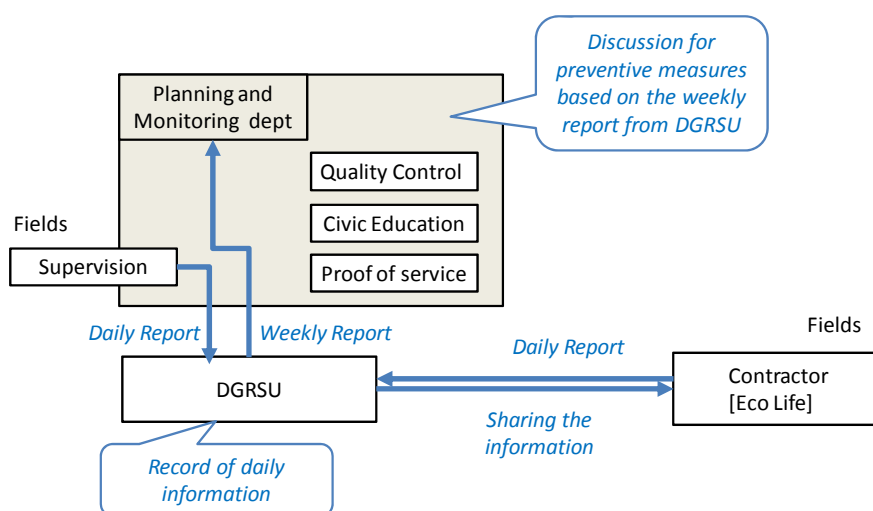
The interventions shown in Table 2.21 are proposed based on the understanding of the present situation. The possible discussion in updating M/P related with each interventions are also shown in the table.

The assumed communication flow among the related parties of the P/P is shown in Figure 2.15.

Table 2.21 Interventions to be applied in the pilot project

Intervention	Actions	Possible discussions in updating in M/P
Integration of daily information from working site	To integrate and record daily information from Supervision section and contractor To instruct and supervise the contractor to provide information which identify containers with problem	Assignment and responsibilities of each sections and contractor Sharing information
Record and analysis of information Discuss measures including countermeasure and preventive measures	To prepare the weekly report which contain the integrated daily information and share the report with DPM and the contractor To identify the critical points and area by analyzing the accumulated information To discuss preventive measures for the identified critical area	Assignment and responsibilities of each sections and contractor Procedure to adopt solutions for the problem
Support to DGRSU for countermeasures	DGRSU. is to take actions to respond the problems reported as daily information	Function of DGRSU to back up inappropriate performance of the contractor and illegal dumping
Execution of preventive measures	To execute the preventive measures adopted based on the analysis of the integrated information from working field. (ex. Awareness raising activity, reinforcing patrol and public campaign)	Assignment and responsibilities of each sections and contractor Procedure to adopt solutions for the problem

Source: JICA expert team



Source: DMSC and JICA expert team

Figure 2.15 Communication Flow among the Concerned Section in P/P

5-4) Expected benefits

The expected benefits by intervention for stakeholders are summarized in Table 2.22. The interventions may cause direct and indirect benefits to citizens.

Table 2.22 Expected benefits of stakeholders from interventions

Stakeholders	Expected benefits
Citizens	Containers without littering and burning of solid waste Enhanced public awareness (as the result of preventive measures)
CMM/DMSC	Promotion of information sharing in the directorate System to analyze and decide countermeasures Clarification and execution of responsibilities of each section
Contractors	Containers without littering and burning of solid waste (reduction of work load) Reduction of the broken containers

Source: JICA expert team

5-5) Synergy with the pilot project by the World Bank

At the same time as the designing of the P/P, the World Bank was preparing another pilot project called as “Participatory Monitoring (MOPA)” in suburban area. The main outcome from the P/P by the World Bank was assumed is an interface and a system which enabled citizens and businesses to report immediately issues of accumulation of solid waste, waste collection and littering in city area to DMSC, CMM through information devices such as cellular phone, smart phone and the internet. It is indispensable to decide and take quick actions of solution after quick processing of a large quantity of information which might be provided from this system.

It was intended and expected that the P/P of waste collection and transportation might supplement the effort by the World Bank because the interventions in the P/P in this 3R project was to deal with how to process and utilize the collected information of difficult situation in the city and which sector of the directorate should be responsible for.

Citizens would cooperate in watching and finding out the problems which are being conducted by supervision section and private contractors in the system introduced by the participatory monitoring project. It would contribute to understanding the needs of people shortly and solving the troubles in the city. The effective system must be created through the synergy of these two P/Ps.

5-6) Necessary resources and trainings

Resources including human resources, equipment, facilities and financial resources are necessary for implementation of any project. In the case of this P/P, the resources shown in Table 2.23 might be necessary for interventions. It was possible to make use of the existing resources such as personnel before considering additional inputs. In order for activation of the existing personnel, the trainings of relevant staff must be conducted and it would be effective for the project implementation. The training shown in Table 2.24 must be necessary at least.

Table 2.23 interventions and necessary resources

Interventions	Conceived resources		
	Human resources	Facility/equipment	Financial resource for operation
Integration of daily information from working site	Existing personnel	Office equipment such as PC	-papers, -stationary
Record and analysis of information Discuss measures including countermeasure and preventive measures	Existing personnel	Office equipment such as PC	-papers, -stationary
Support to DGRSU for countermeasures	Existing personnel	Equipment (truck, loader).	Fuel, shovels and other consumptions etc.
Execution of preventive measures	Existing personnel		materials for activities such as brochure, instruction tools
Integration of daily information from working site	Existing personnel	Office equipment such as PC	-papers, -stationary

Source: JICA expert team

Table 2.24 Trainings required for the Actors of the Pilot Project for waste collection and transportation in urban area

Department and organization	Contents for Trainings
DPM (Supervision)	To learn how to prepare the daily report To understand the identification number of collection points of ECOLIFE
DGRSU	To learn how to record the daily information To learn how to prepare the weekly report
The contractor (ECOLIFE)	To conduct training to the supervision section to share the identification number of collection points of ECOLIFE

Source: JICA expert team

2.2.3 Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area (Activity 2-3)

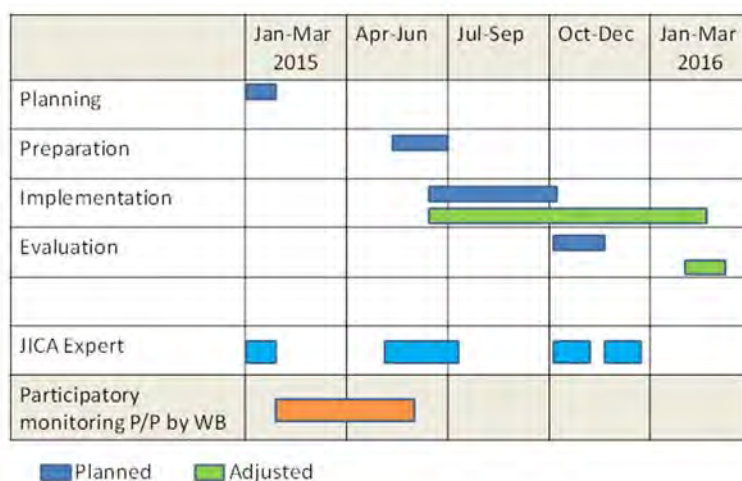
1) Implementation Schedule

The implementation schedule of pilot project is shown in Figure 2.16. The actual schedule was adjusted according to delay in starting activities by DMSC.

The roles and works assigned to each organization concerned with P/P are shown in Table 2.25. Departments and these sections of DMSC shared information and gave feedback between the private contractor to contribute to solutions of problems in collection and transportation of solid waste in urban area.

2) Meeting with the Concerned Organizations

Since the DGRSU are to play main role in this P/P, this department arranged meetings with other concerned sections such as Quality Control Section, Supervision Section of DPM as well as the private contractor at the phase of designing P/P, just before implementation, at the time of sharing the analysis of monitoring result (Table 2.26). The private contractor agreed the purpose of the PP and participated in the meetings and cooperated to the P/P



Source: DMSC and JICA expert team

Figure 2.16 Schedule of P/P for Waste Collection and Transportation in Urban Area Role and Work of the Concerned Organizations

Table 2.25 Role and Work of the Concerned Organizations

	Section	Role and work
DPM	Quality control	Analysis of the weekly report to identify critical area
	Supervision	Daily report to DGRSU and Quality Control
	Civic education	Execution of preventive measures (community meeting, workshop)
DGRSU		Integration of information from daily waste collection work Analysis of information of the day Actions to solve the problem in the collection area Record of information Preparation of weekly report, which will be shared with DPM and ECOLIFE
Private contractor	[ECOLIFE]	Daily report to DGRSU Actions to solve the problem in the collection area

Source: JICA expert team

Table 2.26 Meetings with the Private Contractor

Date	Attendees	Agenda and conclusion
January 23rd, 2015	DGRSU, DPM (Quality Control), ECOLIFE	– Explanation and agreement of the conceptual design of the P/P to the private contractor
June 11th, 2015	DGRSU, DPM (Quality Control), ECOLIFE	– Request of monitoring in the P/P and consultation on the items to be monitored
July 8th, 2015	DGRSU, DPM (Quality Control, Supervision), ECOLIFE	– Consultation between actors who conduct monitoring and prepare daily reports – Discussion on the monitoring items
December 8th, 2015	DGRSU, DPM (Quality Control), ECOLIFE	– Sharing the intermediate analysis of the monitoring result – Modification of the monitoring form because of adding monitoring item – Discussion on methods to identify location of waste containers

Source: JICA expert team

3) Equipment and its Procurement considered for the P/P

In the preparation phase of the P/P, equipment shown in Table 2.27 are considered as necessary.

It was proposed by C/P of DGRSU and planned to repair an existing compactor truck of DMSC which had not been operated in DMSC for the intervention on the problem identified in the P/P. It was reconsidered, however, after start of daily monitoring by the private contractor because it was suggested that the compactor truck might not necessarily be appropriate to deal with the problems reported by monitoring. Accordingly, the repair of a compactor truck was declined for the P/P.

DGRSU utilized the procured PCs for analysis and management of data and information submitted by the private contractor and Supervision Section of DPM. JICA expert team trained the persons in charge in DGRSU about operation of software, MS-office, for data analysis and preparation of the report. Also, other trainings shown in Table 2.28 were conducted for implementation of the P/P.

Table 2.27 Equipment procured and cancelled for the P/P of Waste Collection and Transportation in Urban Area

Equipment (quantity)	Method of Obtaining	Use	Procured/Cancelled
Compactor truck [1unit]	Repair of the existing one in DMSC that is out of operation	Removal of solid waste at the problematic locations	Cancelled: inappropriate to intervene the identified problem by monitoring
PC [2 units]	New procurement	Data analysis and report writing	Procured

Source: JICA expert team

Table 2.28 Trainings conducted for the P/P of Waste Collection and Transportation in Urban Area

Organization	Section	Trainee	Contents for Trainings
DPM	Quality control	Mr. Sergio Mr. Anselmo Ms. Hortencia	To prepare the monthly report To operate QGIS
	Supervision	Mr. Chauque Ms. Esla	To learn how to prepare the daily report To understand the identification number of collection points of Eco Life To operate QGIS
	Civic education	All	To operate QGIS
DGRSU		Mr. Langa Mrs. Stela Mr. Naftal	To learn how to record the daily information To learn how to prepare the weekly report
Private contractor	[ECOLIFE]	Drivers	To learn how to record the daily information

Note. 1) Operation of QGIS was included because it is assumed for presentation of the effect of intervention in discussion with CEEP

2) The drivers of the private contractor were trained by the private contractor itself

Source: JICA expert team

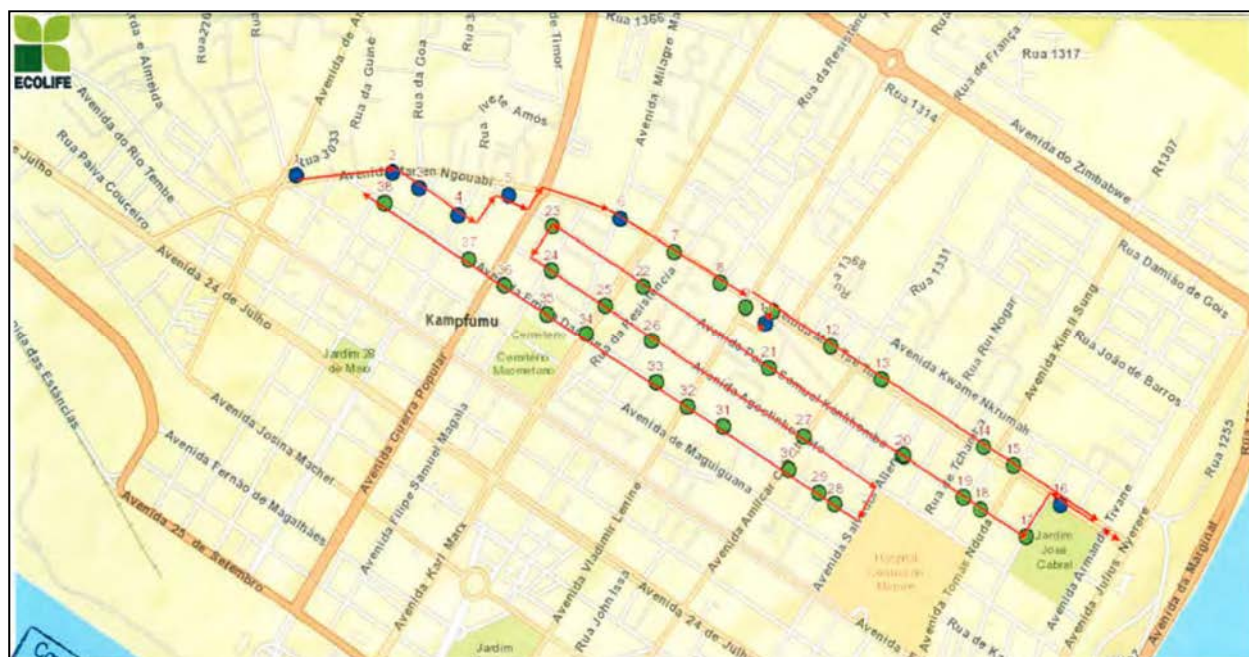
4) Monitoring by the Private Contractor

Upon request by CMM, the private contractor started the delivery of daily report since June 19th, 2015. It could be prepared, by a person in charge in the private contractor, in MS-excel format and sent to the DGRSU through e-mail so that the data could be analyzed by software.

Problematic situation in the working site of waste collection and transpiration in urban area shall be monitored, recorded and reported. It was agreed with the private contractor to monitor all collection routes under operation by them.

The contractor was collecting and transporting solid waste generated along the designated seven collection routes. They send the result of monitoring to DGRSU as a daily report through e-mail. The daily report

by the private contractor has been delivered almost every day except weekend since the said start date. Information of Saturday and Sunday were sent on the following Monday.



Source: Monthly Report of ECOLIFE

Figure 2.17 One of the Waste Collection Routes by the Private Contractor [Route ID4]

5) Monitoring by The Supervision Section of DPM

The monitoring by the Supervision Section was started on July 25th, 2015 slightly later than that of the private contractor because of busyness of the person in charge, preparation and explanation before implementation. After that, in some cases, the daily report was delayed or not submitted due to power failure as well as trouble of e-mail.


As there was limitation of resources in the Supervision Section such as staff and transportation [motorbike], it was evaluated as difficult to monitor all collection routes by the private company. So, the collection route to be monitored by the Section was decided as only Route ID4 at the beginning of monitoring which might have more problems according to the result of monitoring which was started a little earlier by the private company. The collection routes monitored by the Section was gradually expanded.

In the morning, persons responsible for monitoring in the Supervision Section went around the waste collection places in urban area and record the observed problems. The information input in digital formatted daily report was to be shared with Quality Control Section of DPM and DGRSU. While it was sometime not shared within the day of monitoring, the monitoring and sharing the daily report were implemented regularly.

6) Monitoring Items

The result of monitoring was recorded and shared by the private contractor as well as the Supervision Section using a template of the daily report shown below.

Collection route ID, waste container ID, type of problems, reporter of the problem, time of observation are recorded in the report. As described later, types of problem were increased during the implementation period. The format of the daily report is shown as Figure 2.18



Relatório Diário da EcoLife

Data:

Dia	Mês	Ano
31	10	2015

A ser enviado para:

1) DGRSU
2) Secção de Controlo de Qualidade, DPM

Nota: Relate não somente a situação dos contentores, mas também qualquer outra ocorrência relevante no ponto

Nº	Rota	Localização	Nº do Contentor	Problema	Hora da observação	Reportado por	Observações
1	1	Rua Crisanto Castiano Nitima ao Lado da Mieração	4	F	19:06	Abílio	Entulho
2	1	Av. Ho Chin Min ao lado do Comando da Cidade	20	F	19:12	Abílio	Entulho
3	4	Av. Agostinho Neto cruz Av. Olof Palma	0734.0815.0070, 0734.0833.0581	F	21:20	Januário	Entulho
4	5	Rua da Agricultura	50	A	19:18	Nelson	Viatura
5	6	Av. Zimbabwe	1494	F	19:25	Afonso	Entulho
6	6	Campo da Costa do Sol	27	F	22:31	Afonso	Sucatas
7							
...							
21							

Tipo do problema

- A Acesso ao contentor bloqueado
- B Queima de Lixo dentro do contentor
- C Lixo fora do contentor
- D Elevadas quantidades de resíduo comercial
- E Deposição ilegal
- F Outros[especificar acima]

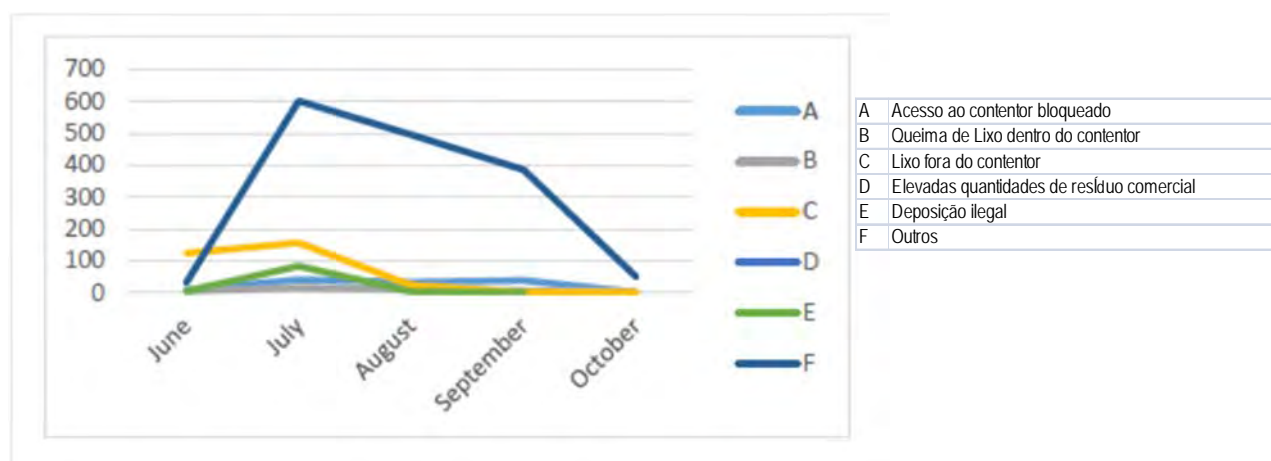
Source: DMSC and JICA expert team

Figure 2.18 The daily report template for the PP and example of record**7) Compilation of Monitoring Result by DGRSU****7-1) Analysis of Monitoring Result**

Although it was planned that DGRSU would prepare the weekly report based on the submitted daily report, the weekly report was not done because of busyness of the person in charge and preparation of trainings. Because of the situation, JICA expert team firstly analyzed the data of June to October 2015, then the analysis was shared with C/P of DGRSU as well as the private contractor.

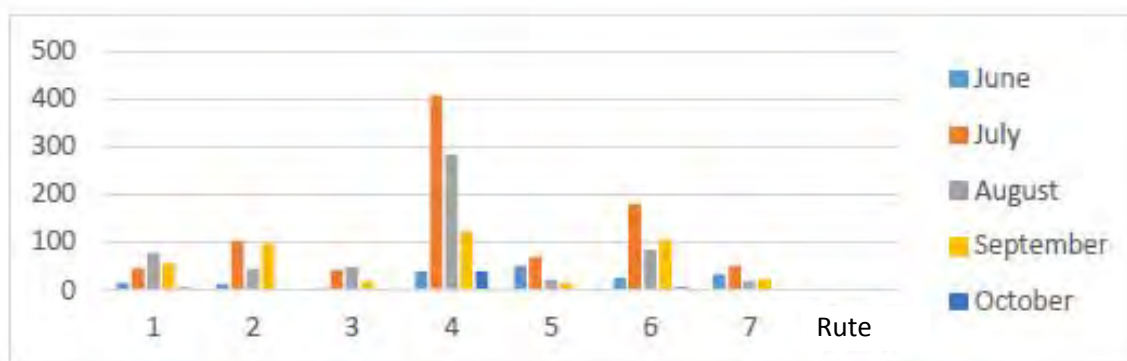
The occurrences of problems by type and by route reported by the private contractor in about four months are shown in Figure 2.19 and Figure 2.20. As seen, occurrence of “F. Others” were mostly reported in every month except June. The most occurrence was reported in July, then it tended to decrease. As for route, Route ID4 and ID6 were considered as routes with more problems relatively.

The breakdown of “F. Others” indicated that the most of F could be classified into debris, scrap [vehicle] and branches. Therefore, separate problem ID were created for these three typical problems in the daily report template and monitoring was continued.



Source: Prepared by DMSC and JICA expert team based on the daily report of the private contractor

Figure 2.19 Occurrence of Problems by Type [June to October, 2015]



Source: Prepared by DMSC and JICA expert team based on the daily report of the private contractor

Figure 2.20 Occurrence of Problems by Route [June to October, 2015]

7-2) Weekly Report by DGRSU

It was envisaged that provision of information through weekly report to the concerned organization and sections would enhance sharing the situation and contribute to accumulation of information useful for considering measures for improvements. It was also intended that the data compilation in weekly report should be simple so that the latest information could be shared on time. Example of compilation in weekly report is shown Table 2.29.

While it is simple, it indicates that the same problem occurred for consecutive days in same location. This P/P intended to facilitate appropriate intervention in the location where same problem continuously happens.

Table 2.29 Data compilation in Weekly Report [example]

Nr.	Route	Location	Problem						
			21/Dec	22	23	24	25	26	27
			Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	6	Rua António Simbine	H		H	H	F	H	H
2	6	Costa do Sol soccer pitch	G		C	C	C	G	G
3	7	Av. Rio Tembe-Malanga	F	G	G		G		G
4	4	Av. P. Samuel Kamkumba corner w/ Salvador Alene			F	F	F		
5	4	Av. P. Samuel Kamkumba Esq. Corner w/ 7 de Set. School			F	F	F		
6	4	Av. Agostinho Neto corner w/ Filipe S. Magaia			F	F	F		F
7	4	Av. Agostinho Neto corner w/ Olof Palma			F	F	F		F
8	4	Av. Emilia Dausse corner w/ Vladimir Lenine			F	F	F		F
9	5	Street Mário de Andrade				A			
10	3	Ronil near the Fire Fighters Station						F	

Note: C, F, G, H are ID code stand for the type of problems reported

Source: Prepared by DMSC and JICA expert team based on the daily report of the private contractor

7-3) Monthly Analysis

The analysis in relatively longer period such as monthly analysis on the situation may be useful too. The monthly basis analysis of the report both from the private contractor and the Supervision Section is shown in Table 2.30, Table 2.31, Figure 2.21 and Figure 2.22. In addition to the occurrence of problem by type and by route, locations with many occurrences of problem were identified.

In reports of the private contractor, a trend of decreasing occurrence of “F. debris” from July to December 2015. Similar trend is seen in reports of the Supervision Section. On the other hand, the trends of occurrence of “C. waste outside of container” are different in the reports by two entities.

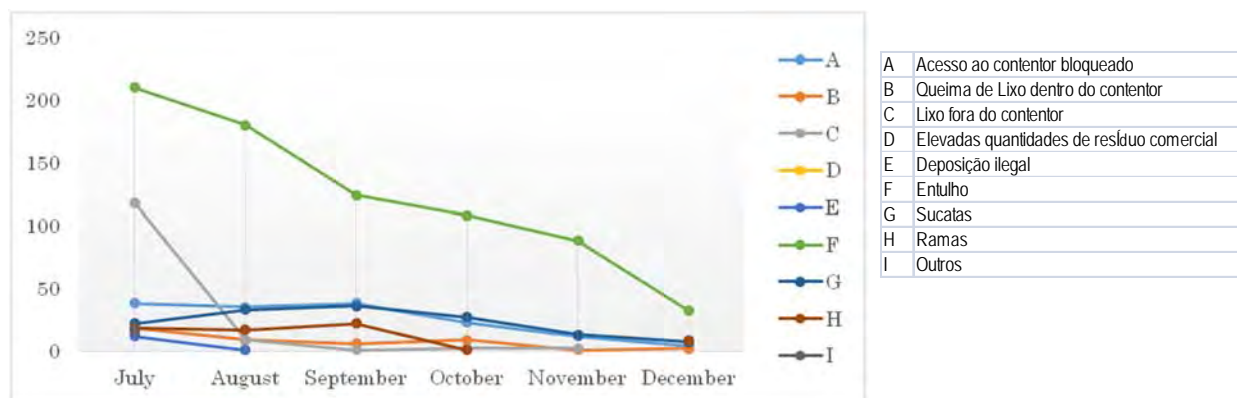
The occurrence in route ID4 indicated the highest in both reports. The following problematic routes are different between the report of the contractor and that of the Supervision Section.

The monitoring result after intervention should provide the information for verification of its effect. Since it would be difficult to evaluate some intervention based on short-time data such as daily or weekly ones, monthly analysis should be considered.

**Table 2.30 Occurrence of Problems by Route
[July to December, 2015: the Private Contractor Report]**

Route ID	A	B	C	D	E	F	G	H	I	Grand Total
1	14	6	15			177	1	4	2	219
2	10	4	6		1	38		18		77
3		3	5	1		26	59	3	1	98
4		1	27			331	1	7	7	374
5	68	9	35		3		1		1	117
6	7	1	8		9	159	66	34	5	289
7	50	21	35			11	10	1		128
(blank)	1		1							2
Grand Total	150	45	132	1	13	742	138	67	16	1,304

Source: Prepared by DMSC and JICA expert team based on the daily report of the private contractor



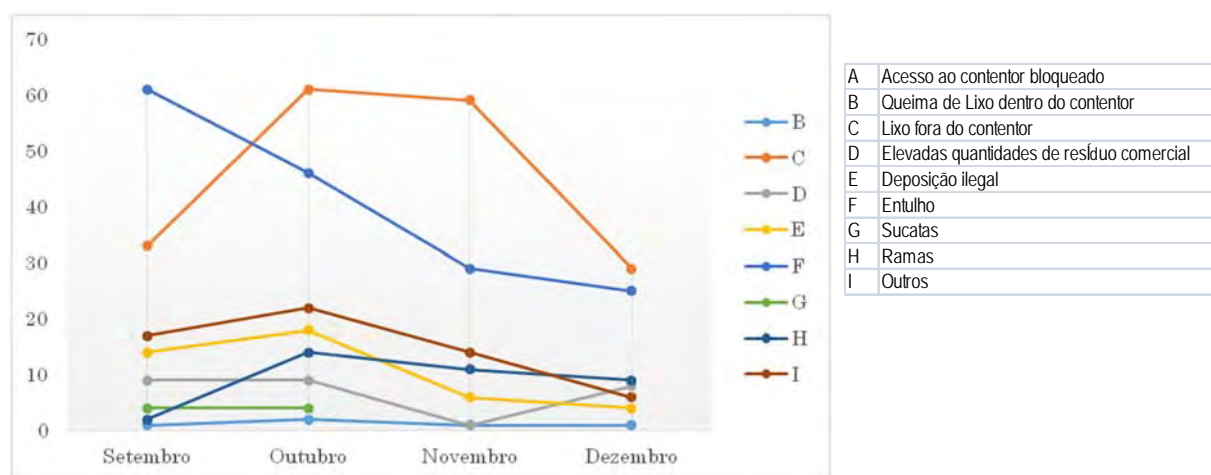
Source: Prepared by DMSC and JICA expert team based on the daily report of the private contractor

Figure 2.21 Occurrence of Problems by type
[July to December, 2015: the Private Contractor Report]

Table 2.31 Occurrence of Problems by Route
[July to December, 2015: the Supervision Section Report]

Route	B	C	D	E	F	G	H	I	Grand Total
1	2	30	2	3	4			22	63
2		13	4	1	20			2	40
3	1	66	8	11	14	1	10	5	116
4	1	26	5	20	46	6	21	7	132
5		5	2	6	33	1	4	4	55
7	1	41	6	1	44		1	19	113
Grand Total	5	181	27	42	161	8	36	59	519

Source: Prepared by DMSC and JICA expert team based on the daily report of the Supervision Section



Source: Prepared by DMSC and JICA expert team based on the daily report of the Supervision Section

Figure 2.22 Occurrence of Problems by type
[July to December, 2015: the Supervision Section Report]

8) Interventions based on Monitoring Result

The monitoring result and its evaluation on the information from the private contractor and the Supervision Section of DPM was shared with other sections of DPM too.

The monitoring result brought the fact that the most frequently observed problems are debris (F), which is not solved by improving collection efficiency, scrap (G) and branches (H), which are not solid waste the contractor have to collect according to the contract. For mitigating this situation, it is necessary to reinforce penalty in short term while reinforcing instruction on construction companies and making strong announcement of solid waste types managed by municipality and its contractor would be countermeasures.

At the same time, waste burning in waste containers (B) and waste overflowing outside containers (C) occurs continuously while the occurrence of these problems varies. For these problems, it was considered that public enhancement to citizens and businesses is necessary besides short term intervention. In this sense, Quality Control Section as well as CEEP of DPM should be involved in intervention. The measures and monitoring method which enable grasping effect of intervention are being discussed.

2.2.4 Review and feedback the result of the Pilot Project conducted in Activity 2-3 (Activity 2-4)

1) Analysis of Result of P/P

The P/P was designed to verify the hypothesis, through achieving the said objectives of P/P, that “Reinforcing the coordination among sections and contractor to utilize the existing information would enhance actions for improvement of situation of waste collection and transportation.”

It took considerable time for the sections in charge to prepare daily and weekly reports as well as preparation for trainings in the period of P/P. Besides, since interventions for improvements based on the collected information were not recorded well, it cannot be evaluated that all objectives have been achieved in P/P. However, it could be highly expected that the experience and learning in the P/P must be helpful to mitigate the problems in collection and transportation works while the preventive measures and those execution have been discussed among the concerned sections.

2) Issues in execution of P/P and future

The following issues were identified in execution of P/P. These issues should be solved to mitigate the problems in waste collection in the condition that private contractor would be responsible for waste collection work under the contract with CMM.

- Recording of the instantaneous measures by DGRSU and the supervision section is to be reinforced: Daily reports of the private contractor have been continued from June 2015 to February 2016. As well, the supervision section prepared and delivered the daily report. Then, it is evaluated that the capacity of accumulating and sharing information has been ensured well. On the other hand, the record of actions taken to solve the problems identified by daily reports is still weak. This aspect is to be considered for further improvement so that analysis on role and performance of these sections could be executed based on the records. It would be possible to analyze necessary input to the concerned sections of DMSC according to result of measures and those effectiveness in order to maintain the present function and even expand it in case that more needs arises.
- The difference in recording of waste container's location between the supervision section and the private contractor: The private contractor uses ID number of each containers on street while the supervision section uses ID number of collection point to identify location of waste containers. The way of identifying the location of containers namely location of problem should be consistent so that comparing information from two sources in analysis would be easier. It was discussed during the P/P and requested to the contractor to use ID number of collection point instead of that of containers. However, this request was not accepted because this change might disturb and delay waste collection works by them.

- Restraint in capacity of DGRSU and the supervision section of DPM: These department and organization have main role in the fields of collection works, not in office. The role required to these sections in P/P was different from the existing ones and recognized as additional. So, the restraint in human and physical resource in these section was observed while PC and infrastructure of IT were not installed well to these sections.

3) Synergy with the pilot project by the World Bank

The P/P has a similarity with MOPA, a pilot project conducted by WB in suburban area, in the intention to identify occurrences of problem and its type in waste collection field while the target areas are different. The part of conclusion in the assessment report of MOPA in October 2015 is quoted below.

- MOPA service is useful to solve problems in the urban solid waste sector in Maputo, as well increase transparency the sector.
- Subsequent phases of MOPA must be taken into consideration.
- As direct results, the following are highlighted:
- The system has identified more than 500 occurrences during the 3 trial months
- The response time from CMM and other actors improved.
- 29 critical points were identified in the four neighborhoods involved in the pilot phase
- 29 assigned monitors were successfully trained in the use of MOPA system.
- Positive external factors were a result of the increase of the interaction and dialogue between the actors shown below:
- The increase of interactions between actors for resolution of the problems
- The establishment of new communication link between CMM and the secondary collection contractor and the secretaries of neighborhoods leads to the resolutions such as the elimination of informal dumpsites and the placement of new containers.
- [quoted from “the conclusion” of the assessment report of MOPA]

In the P/P conducted in the project, the data of occurrence of problems were accumulated and preventive measures have been discussed. On the other hand, the advantages of MOPA are considered as below:

- Information from waste generators such as residents and community can be collected
- The information of problem contains the information of precise location by GPS and can be accumulated
- The secondary collection contractor expressed positive attitude to intervene the problems identified by MOPA system

It was recognized that the positive result was obtained through the coordination among the concerned parties who participate to MOPA same as the P/P under this project.

It was recommended to discuss and implement interventions including preventive measures by using the accumulated data by MOPA, as same as being carried out in the P/P. At the same time, the result of MOPA should be checked and analyzed carefully so that the set-up and responsibility to be assigned to departments of sections of DMSC required can be clarified and confirmed.

The interventions conducted in MOPA were carried out by utilization of existing resource, corresponding to report from partners such as community and residents, through coordination among DMSC, the contractor, ME and so on. It is understood that considerable input was not included in MOPA for action

to solve problem. MOPA was planned to be expanded to all suburban area of Maputo City and the expansion to urban area was recommended as well in the assessment report of MOPA prepared by WB consultant. (In 2016, the MOPA was expanded to all area of Maputo City.)

4) Feedback to the Planning

The feedback shown below shall be considered and discussed while the analysis of result of P/P and feedback to M/P will be continued for the updating the M/P.

4-1) The condition of the contract with the private contractor

The role of contribution to identify problems in the fields of waste collection works may be included in the scope of contract between CMM and private contractors in future.

While the private contractor has cooperated, and submitted the daily reports since the beginning of the pilot project, this task should be included in the contract if CMM require them it as mandatory. As mentioned before, the contractor and the supervision section apply different ID to record the location of waste containers. It obliged difficulty and data processing in comparing the information by the daily report from two sources. It is preferable to apply same method for it so that the process of data analysis would be smooth. Also, it should be taken note that the regular coordination is recommended in addition to communication through reports to exchange opinions and facilitate common understanding of the latest situation and problems.

4-2) Organization and Roles of Department and Sections in DMSC

The role and responsibility assigned in the P/P to the section of DMSC i.e. Quality Control Section, Supervision Section, Civic Education Office of DPM and DGRSU should be reviewed and discussed in updating M/P together with appropriate organization for future. As a result of the P/P, it is obvious that information sharing and discussion/consideration of intervention is necessary and that ensuring coordination among parties in charge of waste collection and transportation works, monitoring and supervising, considering intervention for improvement, and execution and evaluation is very important.

4-3) Countermeasure and Backup Function by DMSC

DGRSU is currently in charge of waste collection according to the contract with waste generators as well as waste removal from illegal dumping, backup work to substitute waste collection in case that the private contractors face difficulties to carry out regular works. It is understood that CMM has promoted utilization of private sector according to the existing M/P to improve cost efficiency and this policy would be maintained for future. Nevertheless, the function of waste collection either waste removal in DMSC should be maintained for any unexpected cases including failure of private companies for waste collection. This function in DMSC and how to utilize it in usual situation should be discussed in updating M/P.

2.2.5 Develop a plan for a P/P for recyclable collection at the primary collection in suburbs is planned (Activity 2-5)

1) Selection of target area

To select the target bairro to conduct a pilot project on segregated waste collection under output 2 activities of the Project, 3 candidate MEs shown in Table 2.32 and Table 2.33 were identified as they already have started recyclable collection by their initiative and their performance on primary collection was highly evaluated by DMSC.

Through the discussions with C/P and candidate MEs as well as field observations of primary collection operations by the MEs, Chumanculo D bairro where ACADEC is in charge of primary collection was selected as target area for the pilot project, considering its performance, cooperativeness, and so on.

Table 2.32 Primary Collection Operation by Candidate MEs

Name of Micro Enterprise (ME)		No. of Tchova	No. of Worker	Zone		Collection Day of the Week	Collection Time	Average Amount of Waste (kg/day)
ACADEC		5	10	Zone 1	Rota A	Mon, Thu	6:00~14:00	6,000~8,000
				Zone 2	Rota B	Tue, Fri		6,000~9,000
				Zone 3	Rota C	Wed, Sat		7,000~9,000
VISABELA		6	13	Zone 1	Campo/Mercado	Mon, Thu	7:00~14:00	11,000~12,000
				Zone 2	Linha Feira	Tue, Fri		9,000~11,000
				Zone 3	Hospital	Wed, Sat		8,000~11,000
Lalita	Inhagoia A	7	14	Zone 1	Rua do Hospital/Principal	Mon, Thu	6:00~14:00	8,250
				Zone 2	Vista Alegre/Escola	Tue, Fri		9,750
				Zone 3	Rua Escol/Vale Infulene	Wed, Sat		9,250
	Inhagoia B	6	12	Zone 1	Jardim Zool/Vale Infulene	Mon, Thu	6:00~14:00	8,219
				Zone 2	Av. Moc/Rua 2/Inhagoia A	Tue, Fri		9,688
				Zone 3	J.Chissano/Q17/V. Infulene	Wed, Sat		9,250

Source: JICA expert team

Table 2.33 Recyclables Collection Operation by Candidate MEs

Name of Micro Enterprise (ME)	Bairro in Charge	Recyclables Collecting	Amount of Collected Recyclables	Destination of Collected Recyclables	Started from
ACADEC (Associacao Comunitaria de Ajuda e Desenvolvimento do Chamankulo D)	Chamanculo D (Kalhamankulo Dist.)	PP (polypropylene)	500kg/month	Sell to Agriplas in Matola City	2011
VISABELA (Limpezas Visabela. Lda)	Aeroporto B (Kamubukwana Dist.)	Paper, Bottle	No data (Very little)	Not sold yet	June, 2013
Lalita (Organizacoes Lalita e servicos. Lda)	Inhagoia A/B (Kamubukwana Dist)	Bottle	2 bags/day	Not sold yet	2012

Source: JICA expert team

2) Selection of target recyclable item

Through the discussions with C/P and ME, considering convenience of households for segregation and existence of recycling market in Maputo City as shown in Table 2.34, glass, metal, plastic and paper were selected as the target items of the pilot project.

Table 2.34 Existing Recyclers and Purchasing Price (as of 2013)

Item	Pagalata	AMOR	Agriplus	Recicla	Comsol
Paper	1.0 Mt/kg	0.85 Mt/kg			
Cardboard	0.5 Mt/kg	0.3 Mt/kg			
PET	3.0 Mt/kg	1.2 Mt/kg	5-6 Mt/kg	4.0 Mt/kg	3.0 Mt/kg
HDP					
LDP					
CDM glass bottle	7.0 Mt/kg	3.5 Mt/kg			3.5 Mt/kg
Other glass bottle					7.5 Mt/kg (Wine bottle)
Tin can	1.2 Mt/kg	0.65 Mt/kg			
Aluminum can		7.0 Mt/kg			

Source: JICA expert team

3) Arrangement for segregated collection

The households in the target area were requested to segregate their waste into 2 categories, which were recyclables (as mentioned above) and non-recyclable (the other waste), and discharge to tchovas. The ME (ACADEC) was obliged to collect recyclables and non-recyclables separately by tchovas at the same time following usual primary collection schedule. The bins were equipped on tchovas so as to collect recyclables and non-recyclables separately.

As the households were requested to discharge 4 items of recyclables as 1 category and contamination of discharged recyclables was assumed, the ME sorted and re-segregated collected recyclables beside the container for secondary collection. Recyclables collected by above mentioned procedure was stored by the ME and sold to recyclers when a certain amount was accumulated.

4) Implementation schedule

Segregated waste collection pilot project was planned and implemented as shown in Table 2.35 and Table 2.36.

Table 2.35 Summary of Designed Pilot Project

Item	Description
Target area	Chamanculo D Bairro
ME in charge	ACADEC
Number of households	1,817 households (by inventory survey)
Target recyclables	1) Glass bottle, 2) Metal, 3) Plastic, 4) Paper
Methodology	The households are requested to segregate their waste into the target recyclables and non-recyclables (2 type) and discharge separately to tchova. The ME shall equip bins to put the target recyclables on each tchova and collect the target recyclables separately. Collected recyclables shall be stored by ACADEC and occasionally sold to the recycling entities. Revenue from selling recyclables shall be used to cover ACADEC's increased labor costs and other necessary expenses.
Interventions examined	1) Goods provision, 2) Bins provision, 3) Household visit

Source: JICA expert team

Table 2.36 Implementation Schedule of Pilot Project

<div>Work Item</div> <div>Schedule</div>	2014										2015	
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Preparation Works												
- Distribution of pamphlet												
- Holding community workshops												
Pilot Project (P/P)												
- Examination of interventions												
Impact Evaluation (I/E)												
-Developing interventions manual												
- Implementation of interventions												
- Baseline Survey												
- Monitoring of cooperativeness												
- Endline Survey												

Source: JICA expert team

5) Trial of segregated waste discharge

As there was no experience to introduce source separation of recyclables in the suburb of Maputo City, trial practice was conducted with the 26 households in Block 5 of Chamanculo D bairro from 25th November to 13th December 2013 so as to examine households' cooperativeness and obstacles for source separation.

Firstly, C/P, ME and JICA expert team visited the target households and asked for cooperation for trial practice by explaining how to segregate target recyclables on 25th November. As it was found on the monitoring on 27th November that households didn't cooperate well for source separation, ME and JICA expert team visited the households again to remind for cooperation. As the result, the cooperativeness for segregation was improved on 10th and 13th December, however, the accuracy of segregation didn't improve as expected. The result of trial source separation was shown in Table 2.37.

As the results of trial practice of source separation, it was confirmed that it will be difficult to get households' cooperation for source separation without any intervention. Besides, candidate interventions to induce waste segregation by households were identified by the interview to residents.

Table 2.37 Result of Trial Source Separation in Block 5 of Chamanculo D Bairro

Monitoring Date	No. of Households Discharged Waste	No. of Households Cooperated Segregation	Accuracy of Segregation					
			Excellent (5)	Good (4)	Average (3)	Fair (2)	Poor (1)	Average
27Nov (Wed)	12	3 (25%)	0	1	1	0	1	2.67
10Dec (Tue)	15	10 (67%)	0	1	5	4	0	2.70
13Dec (Fri)	13	7 (54%)	0	0	4	2	1	2.43

Source: JICA expert team

6) Training for collection workers

Arrangement of segregated collection was designed to be as simple as possible considering capacity of ME and DMSC. As it was difficult to increase number of collection workers and tchovas, the arrangement was made only to equip bins on each tchova and collect the target recyclables separately, as shown in Figure 2.23. Considering acceptability of the households, no change was made on waste collection schedule and routes.



Source: JICA expert team

Figure 2.23 Arrangement of Tchova

Number of meetings was held with the ME, DMSC and JICA expert team to discuss design and necessary arrangements of segregated collection. Also, a series of training for the collection workers of the ME was held as shown in Figure 2.24 to have them understood operation procedures, how to deal with residents, and so on.



Source: JICA expert team

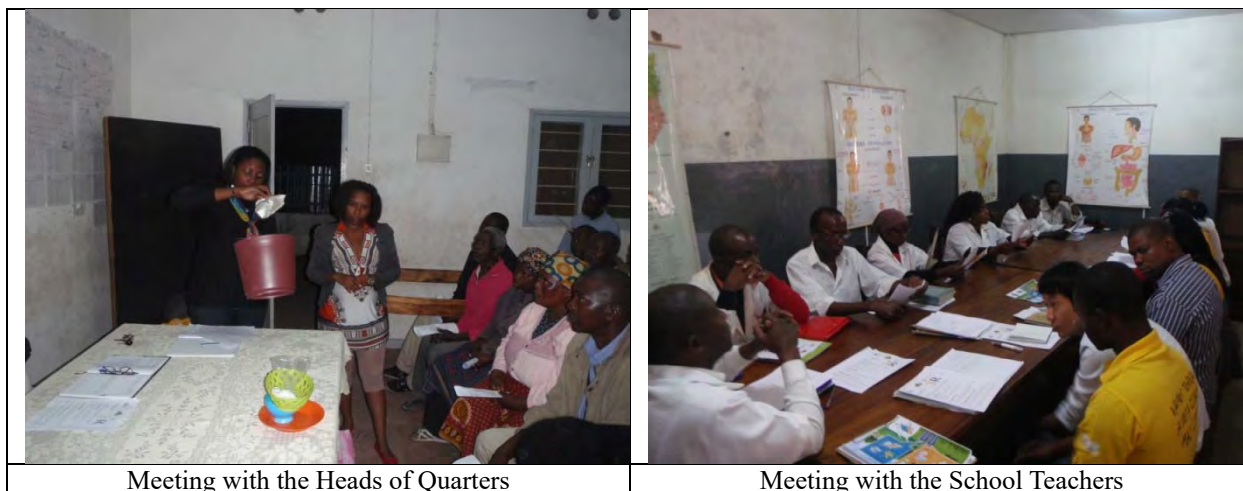
Figure 2.24 Training for ME**7) Dissemination to residents**

In order to announce the P/P to the stakeholders in target area, a series of meeting was held as shown in Table 2.38 and Figure 2.25. The leaflet explaining meaning and necessity of 3Rs and manner to discharge recyclables and non-recyclables, as shown in Figure 2.26, was prepared and distributed to all the households in the target area.

Table 2.38 Record of Stakeholder Meetings

Type	Date	Place	Participants
Quarter Heads' Meeting	22nd May	Community meeting room	About 30 leaders
	4th June	Community meeting room	About 30 leaders
Community Meeting	7th June	Open space in Ch. D bairro	About 50 residents in Block 1 & 2
	14th June	Open space in Ch. D bairro	About 70 residents in Block 3 & 4
School Meeting	23rd May	Primary community school	8 teachers
	5th June	Complete primary school	17 teachers & staff
	24th June	Primary community school	About 100 students in the afternoon class
	8th July	Complete primary school	About 200 students in the morning class
	8th July	Complete primary school	About 200 students in the afternoon class
	15th July	Primary community school	About 150 students in the morning class

Source: JICA expert team



Meeting with the Heads of Quarters

Meeting with the School Teachers



Figure 2.25 Scenery of Stakeholder Meetings



Source: JICA expert team

Figure 2.26 Leaflet on Segregated Collection

8) Intervention to induce segregated waste discharge

In order to arouse households' behavior on cooperation in source separation of recyclables, the three interventions were applied in the P/P by taking the households' requests and the experiences in other countries similar practices. Also, effectiveness of these interventions will be evaluated by randomized controlled trial (RCT) by applying impact evaluation methodology. Table 2.39 shows summary of applied interventions and some picture of interventions practice were shown in Figure 2.27.

Table 2.39 Interventions to Arouse Households' Behavior in Source Separation

Group	Concept of Intervention	Summary of Intervention
Intervention 1	[Incentive Approach] Providing detergents to the household in exchange of cooperation for source separation of recyclables.	The ID and stamp cards were distributed to the target households and the household received 1 or 2 stamps when they cooperated for source separation of recyclables. The small detergents package was provided in exchange of 10 stamps.
Intervention 2	[Convenience Approach] Distributing segregation vessels to the households	The 2 vessels were distributed to each target household so as to facilitate segregation and storage of recyclables in the households.
Intervention 2	[Guidance Approach] Guiding the households to cooperate in source separation of recyclables.	The instructors visit the target households once a two weeks and inculcate the significance of source separation, instruct on how to segregate waste, etc., and monitor household's effort on source separation.

Source: JICA expert team



Source: JICA expert team

Figure 2.27 Scenery of Interventions Practice

The impact evaluation survey which comprises of the baseline and the end-line survey was conducted in September and November to December 2014 respectively, in order to assess effectiveness of these interventions by RCT. The baseline and the end-line surveys consist of waste composition survey and questionnaire survey. The scenery of the surveys was shown in Figure 2.28.



Source: JICA expert team

Figure 2.28 Scenery of Impact Evaluation Survey

2.2.6 Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5. (Activity 2-6)

1) Amount of collected recyclables

The P/P was launched on 16th June 2014 after holding community meetings. School meetings also started together with community meetings has been continued even after the commencement of the P/P. Table 2.40 shows amount of collected recyclables by each item and Figure 2.29 and Figure 2.30 show some pictures of practice.

In the P/P, the amount of collected recyclables was gradually increased by month although cooperativeness of the households was still considered to be low.

Table 2.40 Amount of Collected Recyclables

RECYCLABLE ITEM		AUG		SEP		OCT		NOV		DEC		TOTAL	
		Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)
Paper	White Paper	0.0	0.0	4.0	0.2	1.0	0.0	0.0	0.0	11.0	0.5	16.0	0.2
	Cardboard, Dirty/Colored Paper	43.2	3.6	64.5	2.9	46.0	2.1	39.9	2.1	24.9	1.1	218.5	2.3
	Newspaper	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.1	29.5	1.3	31.0	0.3
Plastic	Hard Plastic	42.8	3.6	95.0	4.3	162.6	7.4	115.5	6.1	82.3	3.7	498.2	5.1
	Soft Plastic	0.4	0.0	32.3	1.5	35.5	1.6	24.0	1.3	16.5	0.8	108.7	1.1

RECYCLABLE ITEM		AUG		SEP		OCT		NOV		DEC		TOTAL	
		Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)	Sum (kg)	Ave (kg/d)
Metal	Aluminum Can	8.5	0.7	12.1	0.6	47.8	2.2	14.5	0.8	3.0	0.1	85.9	0.9
	Tin Can	0.0	0.0	24.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.3
	Steel	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.2	0.0	0.0	3.0	0.0
Glass	Unbroken CDM Bottle	0.0	0.0	13.5	0.6	20.5	0.9	22.5	1.2	18.5	0.8	75.0	0.8
	Broken/Foreign Bottle	16.1	1.3	88.3	4.0	80.5	3.7	137.0	7.2	379.0	17.2	700.9	7.2
TOTAL		111.0	9.3	334.2	15.2	393.9	17.9	357.9	18.8	564.3	25.7	1761.7	18.2

Source: JICA expert team



Source: JICA expert team

Figure 2.29 Scenery of Source Separation Practice



Source: JICA expert team

Figure 2.30 Collected Recyclables**2) Effectiveness of interventions**

As the result of impact evaluation, with regard to the discharged amount of target recyclables (g/household/2-weeks), which was the primary outcome indicator of the randomized controlled trial, each intervention was confirmed effective to increase discharged amount by simple liner regression analysis. Additional 314.8 g in goods exchange intervention (significant at 5% level), 386.1 g in buckets provision intervention (significant at 5% level) and 267.4 g in household visit intervention (significant at 10% level) were discharged from each intervention group in average, whereas 25.57 g was discharged in the control group which received no intervention.

3) Revenue by selling recyclables

The amount of collected recyclables in the P/P was 1,762 kg for about 5 months as shown in Table 0. The ME could only sell hard plastic, aluminum and steel and couldn't sell other recyclables because of low purchasing price and high transportation cost. ME sold in total 583 kg of recyclables and obtained sales proceed of Mt 3,706 for about 6 months from July to December 2014 as shown in Table 2.41.

Table 2.41 Realized Sales Proceed of Collected Recyclables

Item	Amount	Price	Revenue	Buyer
Hard Plastic	500 kg	5.0 Mt/kg	Mt 2,500	Agriplus
Aluminum	80 kg	15.0 Mt/kg	Mt 1,200	Vulcano
Steel	3 kg	2.0 Mt/kg	Mt 6	Vulcano
Total	583 kg		Mt 3,706	

Source: JICA expert team

4) Implementation cost

The initial cost required for installing the P/P was shown in the Table 2.42. On the other hand, no increase of operational cost by the ME was reported, though the ME shared a part of revenue by selling collected recyclables to collection workers as allowance for increased labor force for segregated waste collection.

Table 2.42 Initial Cost Required for Pilot Project

Item		Quantity		Unit Price		Total	
Preparation of separated collection							
1	Buckets for tchova (60L)	10	unit	221	Mt/unit	2,210	Mt
2	Wire for buckets	1	unit	1,000	Mt/unit	1,000	Mt
3	Weight scale (10kg)	2	unit	175	Mt/unit	350	Mt
4	Weight scale (50kg)	1	unit	750	Mt/unit	750	Mt
Sub-total						4,310	Mt
Materials for collection workers							
1	Helmet	7	unit	90	Mt/unit	630	Mt
2	Mask	7	unit	340	Mt/unit	2,380	Mt
3	Gloves	14	unit	110	Mt/unit	1,540	Mt
4	Boots	7	unit	475	Mt/unit	3,325	Mt
Sub-total						7,245	Mt
Dissemination							
1	Theater play by culture group	4	time	5,000	Mt/time	20,000	Mt
2	Snack & drink for community meetings	2	set	5,000	Mt/set	10,000	Mt
3	Leaflet	2,000	set	30	Mt/set	60,000	Mt
Sub-total						90,000	Mt
Total						101,555	Mt

Source: JICA expert team

5) Intervention cost

The cost of each intervention applied to induce waste segregation by households were as shown in Table 2.43. The cost presented in this table was the actual cost required for randomly allocated 1,000 target households for 3 months.

Table 2.43 Intervention Cost in the P/P (randomly allocated 1,000 households for 3 months)

No.	Item	Quantity		Unit Cost		Cost	
Goods Exchange							
1	Detergent	100	unit	2.65	Mt/unit	265	Mt
2	ID Card	250	unit	10	Mt/unit	2,500	Mt
3	Instruction Panel	6	unit	410	Mt/unit	2,460	Mt
4	Glove & Mask	6	unit	600	Mt/unit	3,600	Mt
5	Instructor	36	MD	1,000	Mt/MD	36,000	Mt
6	Vehicle (surf)	6	VD	3,600	Mt/VD	21,600	Mt
7	Stamp	1	set	1,500	Mt/set	1,500	Mt
8	Supervisor	135	MD	1,000	Mt/MD	135,000	Mt
Total						202,925	Mt
Cost per randomly allocated household for 3 months						812	Mt/HH

No.	Item	Quantity		Unit Cost		Cost	
Buckets Provision							
1	Buckets for segregation	500	unit	140	Mt/unit	70,000	Mt
2	Stickers on buckets	500	unit	76	Mt/unit	38,000	Mt
3	Instruction Panel	8	unit	410	Mt/unit	3,280	Mt
4	Glove & Mask	8	unit	600	Mt/unit	4,800	Mt
5	Instructor	48	MD	1,000	Mt/MD	48,000	Mt
6	Vehicle (van)	12	VD	6,500	Mt/VD	78,000	Mt
Total						242,080	Mt
Cost per randomly allocated household for 3 months						968	Mt/HH
Periodical Guidance							
1	Instruction Panel	5	unit	410	Mt/unit	2,050	Mt
2	Glove & Mask	5	unit	600	Mt/unit	3,000	Mt
3	Instructor	161	MD	1,000	Mt/MD	161,000	Mt
Total						166,050	Mt
Cost per randomly allocated household for 3 months						664	Mt/HH

Source: JICA expert team

Based on the actual cost show above, the intervention cost for all the households in Chamanculo D for 1 year was estimated as shown in Table 2.44.

Table 2.44 Estimated Intervention Cost (1,817 households for 1 year)

No.	Item	Quantity		Unit Cost		Cost	
Goods Exchange							
1	Detergent	3,200	unit	2.65	Mt/unit	8,480	Mt
2	ID Card	4,000	unit	10	Mt/unit	40,000	Mt
3	Instruction Panel	20	unit	410	Mt/unit	8,200	Mt
4	Glove & Mask	20	unit	600	Mt/unit	12,000	Mt
5	Instructor	100	MD	1,000	Mt/MD	100,000	Mt
6	Vehicle (surf)	20	VD	3,600	Mt/VD	72,000	Mt
7	Stamp	5	set	1,500	Mt/set	7,500	Mt
8	Supervisor	1,080	MD	1,000	Mt/MD	1,080,000	Mt
Total						1,328,180	Mt
Cost per household for 1 year						664	Mt/HH
Buckets Provision							
1	Buckets for segregation	4,000	unit	140	Mt/unit	560,000	Mt
2	Stickers on buckets	4,000	unit	76	Mt/unit	304,000	Mt
3	Instruction Panel	20	unit	410	Mt/unit	8,200	Mt
4	Glove & Mask	20	unit	600	Mt/unit	12,000	Mt
5	Instructor	133	MD	1,000	Mt/MD	133,333	Mt
6	Vehicle (van)	27	VD	6,500	Mt/VD	173,333	Mt
Total						1,190,867	Mt
Cost per household for 1 year						595	Mt/HH
Periodical Guidance							
1	Instruction Panel	15	unit	410	Mt/unit	6,150	Mt
2	Glove & Mask	15	unit	600	Mt/unit	9,000	Mt
3	Instructor	4,680	MD	1,000	Mt/MD	4,680,000	Mt
Total						4,695,150	Mt
Cost per household for 1 year						2,348	Mt/HH

Source: JICA expert team

2.2.7 Review and feedback the result of the Pilot Project conducted in Activity 2-6 (Activity 2-6)**1) Cost-effectiveness**

Considering that amount of collected recyclables without intervention was 25.57 g/HH/14-days and realized sales proceed of collected recyclables was 2.1 Mt/kg (= 3,706 Mt / 1,762 kg), the cost effectiveness of recyclables collection by the pilot project for 1 year was calculated to be 12.2 g/Mt (81.7 Mt/kg) .

The cost effectiveness of each intervention estimated by the amount of recyclables incrementally discharged by each intervention group and its intervention cost for all the households in the target area for 1 year were:

- Intervention 1 (Goods exchange): 11.6 g/Mt (86.6 Mt/kg)
- Intervention 2 (Buckets distribution): 15.6 g/Mt (64.2 Mt/kg)
- Intervention 3 (Visit instruction): 2.9 g/Mt (344 Mt/kg)

2) Unit cost of conventional waste treatment

Expenditure of CMM in 2014 for the conventional solid waste treatment was 593.1 Mt/t, which consisted of

- 110.8 Mt/t for primary collection by ME (ACADEC);
- 213.6 Mt/t for secondary collection by Enviroserv; and
- 268.7 Mt/t for Hulene dumping site operation.

If CMM adopts a recycling program which consists of the pilot project and the most cost effective intervention (i.e., buckets distribution), CMM will need to expense additional 64,200 Mt/t which will be expected to result in recovering 19.5 t of recyclables per year in Chamanculo D bairro.

3) Recommendation for introduction of segregated waste collection

In the P/P implemented under the Project, 3 interventions applied were confirmed to be effective to induce segregated waste discharge by households. Besides, it was also confirmed that households seldom cooperate on waste segregation if no intervention was applied. As difference of effectiveness among interventions were insignificant, it was judged that segregation buckets distribution was most cost-effective intervention.

However, cost effectiveness of segregated waste collection and interventions were low, if compared with the other recycling P/Ps. In other word, the obtained effects of the P/P and the interventions were unsatisfactory when compared with the required cost, which were assumed to be mainly because of low living standards and low environmental awareness of residents. Therefore, it may not be advisable in the suburb of Maputo City to introduce segregated waste collection in the short term.

However, the conventional solid waste treatment in Maputo City is not acceptable from viewpoint of environmental and social problems associated with open dumping at Hulene and there is great significance to promote recycling activities for effective use of resources and reduction of environmental loads.

The followings are major implications to updated M/P based on the lessons learnt from the P/P:

- Adopting cost-effective intervention:
As there was no difference in effectiveness of interventions, it was judged that segregation buckets distribution was most efficient intervention.
- Minimizing intervention cost:
Most of intervention cost consisted of personnel cost and transportation cost. Therefore, it is desirable to mobilize staff in bairros and DMSC.

Reduction of procurement cost is expected by utilizing reasonable goods/materials such as recycled materials and applying them in large scale.

- Awareness raising of residents:
More cooperativeness on segregated waste discharge is expected by enhanced environmental awareness of residents
- Promoting recycling industry in Maputo City:
If glass recycling factory will be established in Maputo City, imported glass bottles and broken glass bottles could be valuable and their recycling would be promoted.
- Providing storage facility and transportation to MEs promoting recyclables collection:
It was observed that lack of storage space of collected recyclable and its transportation cost was the most critical obstacle for ME's initiative of recyclable collection.
- Recognizing true cost of conventional waste treatment:
The costs of primary collection and secondary collection are increasing year by year.
It is already decided that Hulene Dumping Site will be closed soon and new landfill will be established in Matola City.
It is expected that waste collection & transportation cost will drastically increase because of longer transportation distance.
It is also expected that final disposal cost will drastically increase as new landfill in Matola will adopt sanitary landfill system.
It should be noted that current Hulene dumping site is open dumping type and its disposal cost does not include external cost on environmental and social aspects.

2.2.8 Develop the Action Plan for improvement of waste collection and transportation. (Activity 2-8)

The actions for the following points should be taken and incorporated in the action plan for 2017-2021.

1) Contracts of private contractors

The next renewals of contract for big contractors in suburban area and urban areas are planned for 2018 and 2019 respectively. The DMSC has to prepare TOR for these contracts and conduct tender for the new contract in accordance with the schedule. In the TOR, contribution to the monitoring system on waste collection condition shall be included.

It is proposed to conduct another contracts renewal for urban and suburban area for same year, 2022, so that restructuring and rearrangement of collection system covering entire Maputo City would be possible. In this case, timing of the primary collection should also be decided considering the contract renewal of big contractors.

2) Primary collection

The performance of microenterprise should be studied and evaluated in order to review proper combination of primary collection and secondary collection including number and location of containers for secondary collection. Collection routes of microenterprises are not well organized and can not cover all area of neighborhood currently while detailed information is not available. Such information is necessary to improve the primary collection while it has been recognized that all neighborhoods, except ones in Katembe and Inhaka, receive the collection service of USW.

The collection service by microenterprise has been introduced in one of neighborhoods of Katembe and it would be expanded to other neighborhood gradually. So, preparation of expansion and monitoring of the micro enterprises should be conducted.

3) Capacity development of DMSC

DMSC shall reinforce its monitoring and countermeasure function as most of regular waste collection services are outsourced to private contractors. So, DMSC has to secure fund for maintenance and updating the resources including facilities as well as human resource necessary for dealing with illegal dumping, littering waste and some urgent needs.

4) Action plan on segregated waste collection in suburban area

In the updated M/P, segregated waste collection in the suburban area was proposed from 2022, the 6th year of the M/P period. DMSC will aim to introduce segregated waste collection in 15 bairro by 2027, the target year of the M/P. The number of bairro introducing segregated collection, required cost and estimated amount of recyclable recovered were summarized in Table 2.45.

Table 2.45 Action Plan for Segregated Waste Collection in the Suburban Area

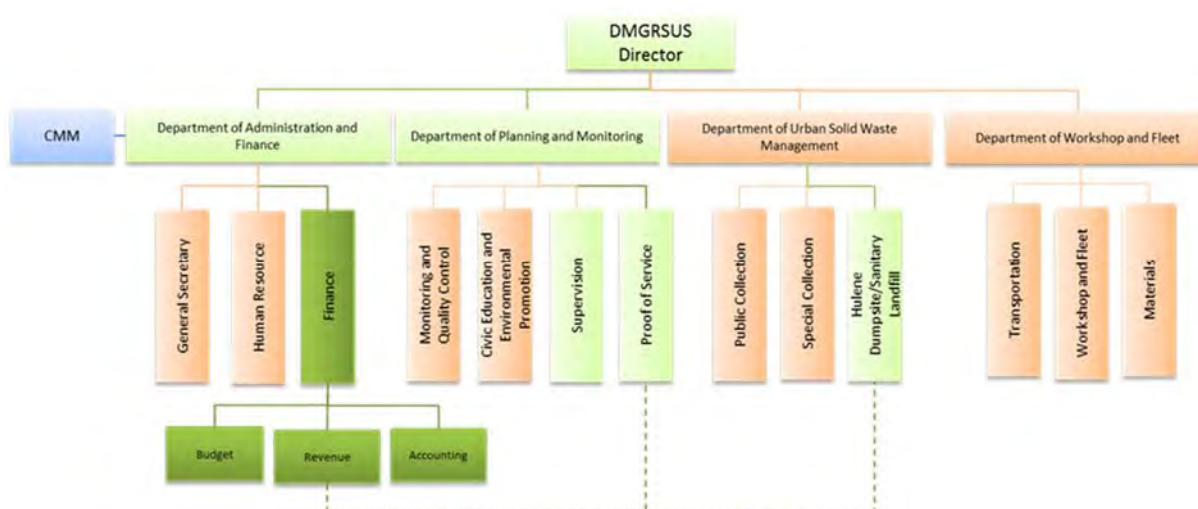
Year	2022	2023	2024	2025	2026	2027
No. of bairro start segregated collection	2	2	2	3	3	3
Total cost for segregated collection (1000Mt.)	2,586	5,172	7,758	11,637	15,516	19,395
Amount of recyclable recovered (ton/year)	39	78	117	176	234	293

Source: JICA expert team

2.3 Activities for Output 3

2.3.1 Review and Analyze the Current Financial Management of SWM (Activity 3-1)

The Finance Section currently does not have subsections, instead, it has personnel in-charge of budget executions: one for permanent funds, and another for consigned (internally-generated) funds. There is also one staff in charge of revenues and another who is in-charge of budget planning and programming. This has inherent weaknesses, as observed from the 1st year to the 4th year of the project. As such, the JET proposed a change in the organizational setup of the Finance Section to facilitate its operations. Figure 2.31 shows the new financial operations structure proposed for DMSC. The diagram had been color-coded for simplicity: dark green for Sections/Units that are directly involved in the financial operations of the DMSC, light green for units that have shared responsibilities with finance; orange for entities that have no direct link or shared responsibility in the financial operations of the Directorate.



Source: JICA expert team

Figure 2.31 Proposed New Structure for Finance in Relation to the DMSC

In the current structure, four staff are under the Section on Administration and Finance or *Reparticao de Administrativa e Financeira*(RAF), each with different tasks: two of which pertain to budget executions (permanent funds and consigned funds), one on revenues, and another on budget planning and programming. However, given that financial sustainability will be the objective of the DMSC for the future operations of the solid waste management, some reforms will be needed, and roles and responsibilities shall be corrected. In the proposed model, instead of personnel in-charge, the Finance Section is proposed to have three subsections: Budget, Treasury and Accounting. Each sub-section will have its own sub-section lead, and one or two Technicians¹, as need be.

With a proposed new method of collecting the cleaning tax (to be discussed in another section of this report), the Proof of Service will only be involved as far as sharing of the database, statistics and reports is concerned. The database, developed for the purpose of revenue generation and monitoring at the Proof of Service, must be accessible to the DAF Chief and the Finance Section. The database contains information on the non-domestic large waste producers (type of activity, classification, etc.), PSPs, large contractors, companies managing their own waste, and companies being serviced by the CMM in terms of waste collection and transportation, and others.

Meanwhile, the Supervisors will be focusing on their ‘policing’ roles or implementers of the City’s regulations on SWM. They will be freed from the tiresome and logistics-demanding task of distributing monthly invoices to non-domestic large waste generators. This way, the Supervisors will have enough time for trainings to improve their capacities as law implementers, and communicators. Giving attention to the capacity-building of Supervisors motivates them to perform well in the tasks they are primarily mandated to undertake. Also, when Supervisors begin to appear and sound with authority, people will give more respect to them. This can help lessen violations on the SWM regulations, and people will eventually feel more responsible about not dirtying the City. This will result to lower apprehensions of violators of the SWM regulations. Fewer apprehensions on violations of the SWM regulations imply lower revenue from fines and violations. But on the positive side, this also means the CMM will be able to free up costs on cleaning the public spaces because of the behavioral change among locals and visitors. This can also bear non-financial benefits to the City.

The following defines the three sub-sections under the Finance Section of DAF, as well as the other Sections in the Directorate which shall have shared responsibilities in the financial operations of the Directorate:

- **Budget** – The Budget sub-section shall be composed of budget planning and programming, and budget operations for permanent and consigned funds. The Budget sub-section will be headed by a Budget Officer. Under him/her will be the technician in-charge of budget planning and programming, and technicians in-charge of consigned funds and permanent funds. The technicians in-charge of either consigned or permanent funds will conduct the budget disbursement processes consistent with the budget request and release procedures. The payroll can be processed under the Technician/s on permanent funds.
- The Budget Officer will monitor, evaluate and report on the budget operations by counterchecking funds availability with requests and disbursements of funds. He/she will be dependent on the periodic reports and records from the technicians. It is important that the Budget Officer shares his/her evaluation to the DMSC management every quarter of the fiscal year. He/she will also be the initiating strategic planning on how to make efficient use of the limited resources of the sector. The Budget Officer also directly liaises with the Treasurer with regards to budget requests.

¹ In DMSC, or the CMM as a whole, refer to technical staff as Technicians.



Source: JICA expert team

Figure 2.32 The Budget Sub-section

- **Revenue** – The Revenue Officer shall head the Revenue sub-section. He/she will evaluate and monitor revenue collection and will be dependent on the regular reports generated by the technicians handling the different revenue sources. He/she will also directly manage the SWM account², or where all internally-generated revenues are deposited. The Revenue Officer will come up with strategic plans on how to improve revenue collections, together with the technicians and in consultation with other core or relevant staff of the DMSC. The Revenue Officer, with approval from the Director, authorizes the release of internally-generated funds³ to the Budget Officer pertaining to budget requests. For expense items on which externally-sourced funds will be needed (such as budget from the CMM or donors), the Revenue Officer facilitates the release of funds in coordination with CMM Budget and Revenue Departments.

² Given the long experience of the DMSC on delayed releases of funds and lack of control to finance critical expense items in its operations, it is considered important that all internally-generated funds be deposited in a SWM account that can be managed by the Treasurer. Should discussions with CMM Finance flourish regarding this recommendation, it is expected that operations of the sector will improve since critical expenditures, such as repairs and maintenance of equipment and facilities, can be funded promptly, with streamlined procedure. However, if this recommendation is denied, then the Treasury's main responsibility will be confined to ensuring that revenues are optimized.

³ This is done with the assumption that a special fund for SWM is created.

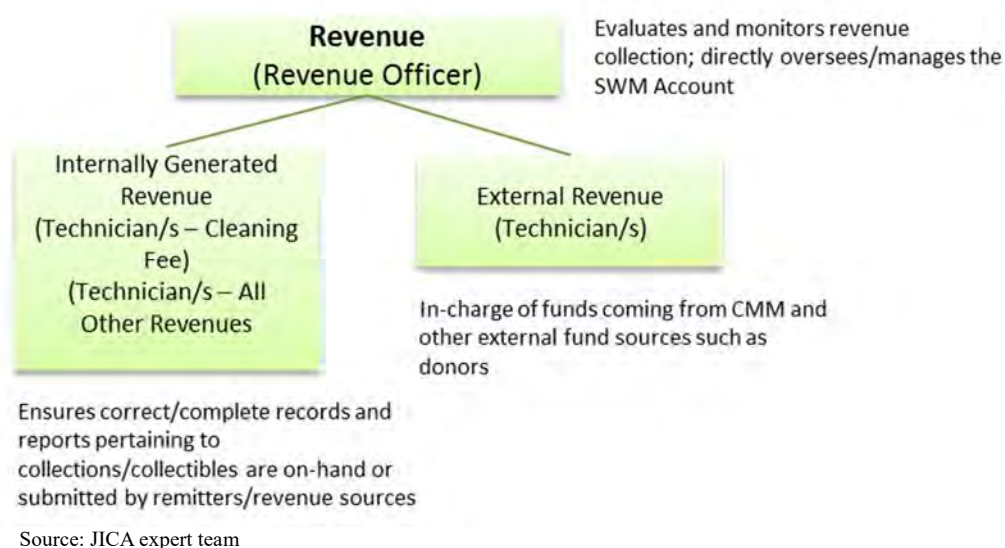


Figure 2.33 The Treasury Sub-section

- **Accounting** – The Accounting sub-section will be headed by an Accountant or Accounting Officer. The sub-section ensures that all accounts are paid, including payroll, that revenues are collected, and that expenses and incomes are reconciled. The sub-section will be producing the financial statements (balance sheet, income statement, and cash flow statement, or any financial document/s consistent or compliant with the Mozambican accounting system) that provide the overall information on the financial performance of the DMSC. It shall also be the main overseer of the Special SWM account of the Directorate.

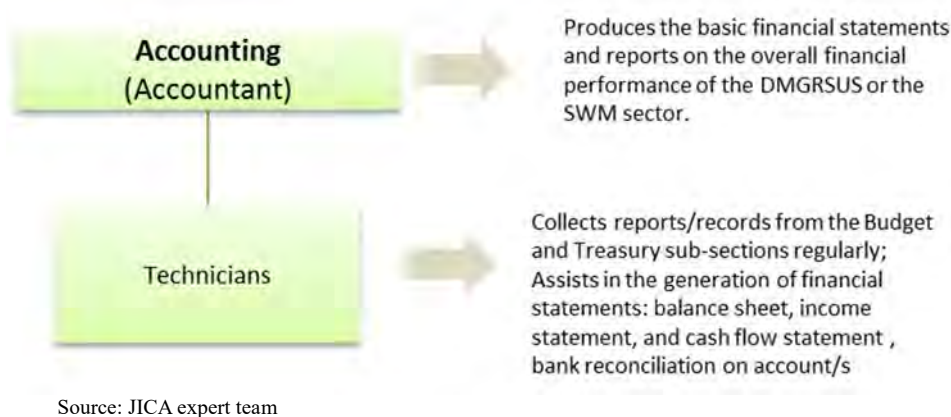


Figure 2.34 The Accounting Sub-section

The cleaning fee is the largest contributor to the internal revenue of the Directorate, giving at least average 90% share, annually. It is critical that efficient and prompt collection is made. It is thus important that a Technician is devoted on the timely and optimal collection of this revenue, as well as obtaining relevant periodic statistics from the *Electricidade de Moçambique* (EDM), which is the service provider of the CMM for the collection of the cleaning fee. The cleaning fee is paid by domestic (households) and non-domestic large waste generators (businesses, institutions, industries, etc.). For domestic waste generators, the full amount is collected by the EDM through the monthly electricity bill or from purchases of pre-paid electricity. For the non-domestic large waste generators, about 8% of the cleaning fee is collected by the EDM through the monthly electricity bill or from purchases of pre-paid electricity. The remaining 92% is

paid to the CMM. The EDM gets 5% of its total collections of the cleaning fee (from both domestic and non-domestic) as payment for the service provision to the CMM.

The Technician/s devoted to the collection of the cleaning fee will ensure that: 1. EDM remits its monthly collections in a timely manner, the specific date of which must be decided with EDM, 2. EDM submits records/reports pertaining to its collections such as statistics on domestic and non-domestic connections classified according to cleaning tax echelons, collection efficiency rate for the month, and others, 3. distribution of online invoices⁴ for the non-EDM collected portion of the cleaning tax, 4. monitoring of prompt on-line payments by the non-domestic large waste generators, 5. communicating non-payment of the cleaning tax by non-domestic large waste generators to authority for appropriate action, and 6. generate regular reports on collections.

The Technician/s in-charge of all other revenues will ensure 1. timely and optimum collection of other internally-generated revenues as license fees, fines and penalties, special services, final disposal tipping fees, etc., 2. monitor the correctness of payments using the database lodged at the Proof of Service and shared with the DAF and the Finance Section, 3. notify parties in case of erroneous and/or default payments and inform authority, if necessary, for appropriate action, and 4. generate regular reports on collections.

The Technician/s in-charge of externally-sourced revenues, such as the budget support from the CMM and donations/aids, or loans from development partners will monitor, oversee and ensure the availability and release funds to finance critical projects and activities that have been programmed specifically for these funds. It will also produce regular reports that will satisfy the funding agency.

Proof of Service plays an important role in the financial operations because it is the source of tremendous monitoring data and statistics critical to finance. The Proof of Service, which is under the Department of Planning and Monitoring (DPM), and which is the overall manager of the database on contractors, waste generators, PSPs, and others, will have a direct link with the Finance Section. These two sections must hold monthly meetings to share updates on the database, among others.

As envisioned for the future, the delivery of invoices for the cleaning tax to large waste generators will be **online**. However, it is understood that the system may encounter challenges sometimes and manual invoicing may be necessary. Moreover, follow ups on payments for fees such as license fees, final disposal tipping fees, fines and penalties, as well as continued registration of large waste generators will still have to be done manually or through actual visits. In this regard, the Supervisory Section will also have shared responsibility with Finance and must be represented in the monthly meeting between the Finance and Proof of Service Sections.

The Hulene dumpsite is a revenue source for tipping fees. Although licensed service providers that use the Hulene dumpsite are invoiced monthly and payments can directly be deposited to the SWM account, some individuals or entities who do not have contracted PSPs and dispose of their wastes at the dumpsite must make payment on site. Moreover, the dumpsite can function as a registration point for PSPs that have not registered or paid for the annual license. The Hulene dumpsite management must appoint a person in-charge of this registration and fee collection. The Revenue sub-section will monitor the activity for correctness of collections and transparency of financial data. All collections must be made to the SWM account on a weekly basis.

Meanwhile, with regards to financial performance in the 4th year of the project, the improvements in DMSC's financial management seen during the 3rd year were sustained. Viewpoints regarding financial management, appreciation of roles of each individual in the sector, utilization of simpler models, continuation of initiatives in the first three (3) years resulted to an overall improved outcome.

⁴ From a series of strengths-weaknesses-opportunities-threats (SWOT) analysis with the DMSC, online invoicing and payment system emerged as the most convenient and easily monitored method of collecting the cleaning fee from the non-domestic large waste generators. Such a system is further discussed in the appropriate section of this document.

As in 2015, the 2016 budget correctly categorized budget items. In the past, huge operating costs such as payments to services in the transportation and collection of wastes, rent for equipment operating at the Hulene dumpsite, civic education and information campaigns, and payments to consultants were classified under the Capital Expense section of the budget. As explained to the DMSC since 2013, capital expenses differ significantly from operating expenses: capital expenses pertain to major purchases or construction of assets to start or expand a project, while operating expenses pertain to purchases of goods and services that are necessary for the daily undertakings of an office or project. In the first 2 years of the JET in DMSC, it has always been pointed out that the classification of items in the budget are misleading. The way the budget was organized in 2013 and 2014, it would seem as if the DMSC spent more on long-term investments and spent less on its operations. While this may be true in some public services sectors, as in infrastructure development, in solid waste management, operations require high operating expenses since major activities are done daily and typically require high funding. Also, looking at the details of the previous budgets, the allocations in the capital expenses actually pertained to operations. Moreover, these budget items were under the classification of “Other Capital Expenses/Outras Despesas Capital”, which was more confusing as budget items labeled “others” refer to non-regular expenses.

In 2015, this was corrected, and the practice was continued in 2016. Table 2.46 is a summary of the 4-year budget, or during the project period, showing the shift in the values between capital expenses and current operating expenses. “Bens e Serviços/Goods and Services” now contain the major operating budget requirements on waste transport and collections, Hulene dumpsite operations, civic education campaigns, and others, while “Capital Expenses/Despesas Capital” only contained planned acquisition of equipment and machines.

Table 2.46 Historical and Current Budgets of DMSC

Budget Item	2013 (Mt)	2014 (Mt)	2015 (Mt)	2016 (Mt)
<i>Current Expenses</i>				
Personnel Expense	24,124,486	25,155,607	25,155,607	25,122,980
Goods and Services	7,621,161	7,817,652	230,942,363	185,872,822
Current Transfers	120,000	200,000	7,636,119	9,141,947
Other Current Expenses	17,535,427	21,931,912	-	-
Prior Year	-	-	2,055,779	-
Others	-	-	450,000	-
<i>Capital Expenses</i>				
Capital Goods	18,662,998	2,530,000	1,505,500	873,059,453
Other Capital Expenses	114,478,177	167,145,717	-	-
Total Budget	182,542,249	224,780,888	267,745,368	1,093,197,202

Source: JICA expert team

It is important to note that in 2016, total budget shot up to Mt 1.093 billion, or a jump by 308% from the 2015 budget. This is because the CMM included a budget of Mt 870 million for the anticipated infusion of capital from South Korea for the construction of the sanitary landfill in Mathlamele, in the form of borrowing. However, because of land issues pertaining to resettlement of some households, the project implementation did not push through.

During the budget season (June to August, 2016) the DMSC staff also conducted several workshops on activity and budget planning for 2017 using a template developed by the JET in the 2nd year of the project and was first tested on the 3rd year. The participants who were involved were not just the department and unit heads, but also regular staff. The activity and budget planning template required participants to identify and describe their overall goals and set targets. This was to ensure that activities to be conducted for a particular period are consistent with what they want to achieve. The proposed 2017 budget was drafted in these workshops. The Chief of Administration and Finance took over the integration of the budgets per

section into one budget proposal of the DMSC. Admittedly, there is still much improvement that is needed in the practice of activity and budget planning, the DMSC will make good progress if the practice is continued. The 2017 budget proposal was submitted to the CMM Finance for evaluation.

Another improvement seen is in Prova de Servico (PdS) section, which currently is the main internal revenue-generation arm of the DMSC. As observed and analyzed by the JET in the 1st year of the project, the database on which the PdS was working on were outdated and erroneous. Together with the C/Ps, the PdS and the Supervision section, it was agreed that efforts had to be made in correcting the database. It was also agreed that a new computerized system of registration and invoicing be developed and installed at the PdS. During the 2nd year up to the 4th year, much efforts were made to get businesses and establishments register anew at the PdS to correct their profile such as nature of business, contact information, size and scope of operations, among others. This information helped the PdS in correctly classifying and categorizing businesses and institutions and assign the appropriate cleaning fees/taxa de limpeza. In the past, classifying and categorizing the businesses and institutions relied on a very subjective approach (i.e., the Supervisor intermittently conducts an ocular inspection on the trash of the registered business or office, and makes an estimate of the waste volume, based on visual appraisal). From only 800 businesses and institutions paying the cleaning fee, the PdS was able to register and correctly categorize over 5,000 by the 4th year.

Businesses and institutions are collectively termed as non-domestic large waste producers. On the 2nd year of the project, the JET devised a more sound and technical system of classifying and categorizing these large waste producers using results from the waste quality and quantity survey conducted by the 3R Project. On the 3rd and 4th years, this categorization was applied. Instead of generalizing all large waste producers as what have been practiced by the DMSC over the years, they were classified according to activities such as Restaurants, Hotels, Social and Public Institutions, NGO/Donors/International Organizations, Private Offices, Commercial and Industrial. Utilizing the results on waste quality and quantity survey, and according to size of operations in Maputo City, the amount of waste per large waste producer was determined. The correct cleaning tax was then imposed appropriately and on a more systematic manner. Such practice will also be useful in determining the correct waste volume generated in the City by the large waste producers, when all have been registered in the PdS. A very positive result came out from these significant changes: whereas in the past three years (2013 to 2015), revenues from the cleaning tax that are collected by the PdS only averaged at Mt 2.8 million, this grew to 6.37 million by the end of 2016 or an increase by 128%.

Considering the observed challenges in data collection, organization, and analysis during the 1st year of the project, the JET devised a Revenue Updater Model and a Budget and Expense Tracker Model which were tested in the 3rd year of the project and continued to be used on the 4th year. A workshop was conducted among the staff of the Finance Section, with the participation of the Chief of the Department of Administration and Finance (DAF) and the finance C/Ps, to explain the objectives of the models, and show them how they can be used when the models were first tested on the 3rd year. Hands-on practice was conducted during the workshop. The C/P in-charge of revenues, Ms. Rosa, was able to utilize the Revenue Updater Model and easily applied it in organizing the revenue data monthly. On the other hand, the Budget and Expense Model, which was more exhaustive, can be used by the C/P in-charge of costs, Ms. Adelina, but she preferred to apply it in January 2016. In 2016, Ms. Adelina was transferred to PdS as Chief and was replaced by Mr. Almanjane to be in-charge of the costs. Mr. Almanjane, who became a C/P in Finance (Ms. Adelina continued to be so, as well) applied the Budget and Expense Model for 2016 and was able to produce periodic reports. It was agreed that the models will be used to facilitate the recording and reporting of essential financial management data such as revenues and costs.

On the 4th year, the DMSC continued to be dependent on the CMM in terms of fund releases. Meaning, the control of money was still largely under the CMM. This is because the DMSC still does not have a special account for its internally-generated revenues. Fund releases are still requested from the CMM, which would entail a process that could take as long as weeks and months. This is the major cause in delay for payments of accounts. The JET and the C/Ps devised a diagram showing the flow of budget request and releases,

indicating timelines to be noted by the DMSC staff requesting for funding for a particular activity. In time, the CMM and the DMSC must develop a special account to avoid delays in payments of goods and service essential to the operations of the sector.

One important issue with regards to use of funds on the 4th year was the ‘re-centralization’. The DMSC has a bank account with BIM where permanent fund (fund Permanente) or money that is used on daily operations such as fuel, water, electricity is deposited. This money comes from the CMM. All Directorates in the City have their own bank accounts for this type of fund. This is part of the government’s decentralization of service provision. However, by October 2016, the JET was told by the Finance Unit that these bank accounts were ordered closed by the CMM finance in July. The counterparts, Ms. Rosa and Mr. Almanjane, as well as Mr. Alexandre who is specifically in-charge of permanent funds processing, believed this was because of the CMM wanted to centralize all payments again for full budget control.

Such move was regressive. JET aimed to set the groundworks for financial sustainability of the sector, which is the rational progression from the current status. Going back to centralized budget operations will make the procurement of goods and services go through a longer process. Because at that time, it was already on the last quarter of the fiscal year, this further added to the confusion. JET then asked for the formal communication regarding this ‘closure of bank account’ to understand the rationale or justification of this development. However, none in the Finance Section has seen a letter or official memo from the CMM regarding such move, and even suggested that the communication was merely verbal. The JET then requested for a meeting with the Director.

In the meeting, the JET asked the Director about the closure of the bank account and whether he has the official communication from the CMM. The Director called for the presence of the counterparts and Mr. Tsotsane in the meeting. It seemed that even the Director has not seen the letter but he is aware of such closure. There was a lot of finger-pointing during the meeting when the Director was asking about the communication letter but no one seems to have it or has seen it, even the Director himself. And yet they “closed” the account. To this, Mr. Tsotsane explained that no bank account was closed. Instead, the transfer of permanent funds to the bank account was stopped. As to the reason why, Mr. Tsotsane was not certain. The exchanges during the meeting between the DMSC Finance Unit and the Director showed that obviously, there was a lot of internal misunderstanding. The Director called up several people, including the CMM Finance Director, Mr. Ananias Couana, to get clarity on the issue. The JET suggested for a meeting with the CMM Finance Director.

Following the confusion, a formal meeting with the CMM Finance Director was conducted. It was explained that it was not a closure of the bank account but an act to prevent many instances of non-compliance with procedures, the main one being payment for services and goods without observing procurement procedure or not having contracts at all. The action is for all the directorates, not only DMSC. Currently there are about 64 suppliers at CMM that have no contracts in Maputo City. The Finance directorate had to be proactive by leading the revision of all payments so as to minimize these breaches. The Finance Director assured the JET and the DMSC that such measure will not delay payment to suppliers as long as the directorates follow the correct budget request procedures and all pertinent documents are submitted. This budget restriction will be lifted when all directorates and districts have been provided with training on the procurement process.

The JET and the C/Ps also analyzed the Hulene dumpsite, particularly on the contracts and operating costs. It was seen that previously (2013-2014), services rendered by all rented heavy equipment were mostly on a 9-hour/day basis. However, in 2015-2016, hours were increased to 15 up to 20 hours per day, a workload that is not a technically viable scenario. In 2014, short contracts added up to 8 months, with the same company, HidroConstrucoes, LDA. In 2015, 10 months was the duration of the contract. In 2016, a full-year contract was made, for the service of four machines. However, it was observed that the Hulene dumpsite no longer have mountains of garbage to manage because much of the works to organize the dump had been done in 2014 and 2015. Hence, maintenance and waste organization works must be relatively easier than in the previous years. In two meetings with Department of Workshops and Motorpool or

Departamento de Oficinas e Parques (DOPA) (represented by Mr. Manjate and Mr. Zandamela) and Dir. Chivambo (June 6 and June 10), the DOPA asserted that on dry season (April to September), only one up to a maximum of two machines may be sufficient to work on the landfill site. On wet season (October to March), a supplementary vehicle may be required. The back hoe (*retroescavadora*), which is used to complement the CMM waste collection, may be rented only as required. Evaluating monthly data from 2014 to 2016 on the services rendered on Hulene and invoices paid for by the DMSC to the service contractor also showed that there was no clear trend in availing of the service based on season nor work requirement. It appeared that even on dry season, the value of the invoices remained almost the same with the invoiced services during wet season when most of the work is required.

Also, in the meetings with DOPA and Dir. Chivambo, it was asserted by the technicians that heavy equipment or machines such as those rented for Hulene dumpsite cannot work 15 to 20 hours daily as it would constantly be at risk of overheating and damage. Also, the amount of work at Hulene is observed to not require continued bulldozing for 15 to 20 hours. It is important to determine the baseline for work required according to what needs to be done. Secondary data or information as reference must be on-hand. A baseline study on workload must be done by DPM at the dumpsite so that the Directorate can have its own reliable data. This information must be made integral to the service contract as basis of the service engagement.

Checking in detail all the submitted invoices of the contractor to DMSC, it appeared that the contractor claims some of the machines were working over 24 hours in some days. For example, in March 2014, the invoice claimed that the Bulldozer D6T was used for a total of 1,575.25 hours or a daily utilization of 50.81 hours. Strict and strategic monitoring at the ground level by the DPM and the GRSU must be in place to ensure services engaged are provided effectively. RAF must be provided with reliable monitoring data to countercheck and evaluate invoices submitted by the contractor and budget requests from the Department-in-charge, in this case, the DGRSU, prior to processing payment. Involvement of people from DOPA and DAF/RAF in the development and review of all contracts must be considered compulsory.

Over the past years, average contract costs for services engaged for Hulene have amounted to Mt 57 million annually, with 2016 having the highest at Mt 77 million. Procurement of new equipment to be operated by DMSC is more sustainable in the long-run. Time and again, the DOPA has been proposing for the procurement of new heavy equipment. Given DOPA's capacity to operate and maintain such equipment, it will be more advantageous for the Directorate to have its own equipment for the following rationale:

New equipment typically carries with it a service warranty for 3 years, and even a 1-year insurance, saving the DOPA financial resources for the performance maintenance service. During this period, the DOPA technicians can upgrade their capacity on servicing such equipment through trainings so that after the warranty is finished, skills of DOPA staff have likewise been upgraded;

With a Mt 78 million budget for service provision at Hulene involving four vehicles in 2016, the DMSC can procure brand new essential equipment for only roughly Mt 50million, with economic life of 10 years, thereby eradicating the necessity to rent a whole set of equipment to operate in Hulene, except for complementary machines when the situation calls for it, such as emergencies;

Monitoring will be easier, especially on fuel consumption, if the DOPA will know the actual amount of diesel necessary to do a full-day's work per machine, applying only a contingency allowance of 10%. This can be done through actual field monitoring to get the baseline fuel consumption;

In the near future when Hulene will be closed and a landfill will start to be operated by a private partner, these additional assets can be rented out, thus creating additional cash inflow to the DMSC.

At the mid-year evaluation of budgets, the DMSC was only allocated Mt 41million for Hulene engaged services, which means a shortfall of about Mt 37million from the contract cost. With the invoices being paid to the contractor, budget execution has already reached 74% until April 2016. It was highly necessary to review the contract, and especially check whether the agreement was being very disadvantageous to the DMSC. A revision must be proposed where minimum performance specifications and monitoring

requirements must be rightfully put in place in the service contract. A proposal to revisit and revise the 2016 service contract for Hulene was done based on the following premise:

- No performance monitoring activities on actual workload, fuel requirement, etc., are specified in the contract;
- No quantifiable minimum performance specifications are indicated in the contract.
- Assuming a more realistic optimum workload of nine (9) hours per day per machine, instead of 15 to 20 hours, contract cost can be recalculated as follows:

Table 2.47 Basis of Proposed Revision of 2016 Service Contract for Hulene

ORIGINAL CONTRACT

Unit	Workload in Hours	Price per Unit (Mt/hr)	Cost per Day	Cost per Month (Mt)	Cost per Year (Mt)
Bulldozer D6T	20.00	2,083.33	41,666.60	1,249,998	14,999,976
Bulldozer D8T	15.00	4,600.00	69,000.00	2,070,000	24,840,000
Excavator (40-ton capacity)	15.00	3,800.00	57,000.00	1,710,000	20,520,000
Backhoe loader	15.00	1,166.00	17,490.00	524,700	6,296,400
				5,554,698	66,656,376
VAT	17%			6,498,997	77,987,960

REVISIT CONTRACT/PROPOSED CHANGE

Unit	Workload in Hours	Price per Unit (Mt/hr)	Cost per Day	Cost per Month (Mt)	Cost per Year (Mt)
Bulldozer D6T	9.00	2,083.33	18,749.97	562,499	6,749,989
Bulldozer D8T	9.00	4,600.00	41,400.00	1,242,000	14,904,000
Excavator (40-ton capacity)	9.00	3,800.00	34,200.00	1,026,000	12,312,000
Backhoe loader	9.00	1,166.00	10,494.00	314,820	3,777,840
				3,145,319	37,743,829
VAT	17%			3,680,023	44,160,280

Source: JICA Expert Team

The JET also assisted the DMSC in evaluating service contract proposals. A simple model in which the directorate can calculate the cost of taking over a particular activity, such as collection and transportation which is currently done by large contractors, and comparing their own costs to the financial proposal of the bidders, was done and provided to the DPM. This way, the directorate can determine whether such activity, when done by a contractor, will be more cost-efficient to it than not. It will also enable the directorate to compare several bids and how costings were done.

In July 2015, the tipping fee at Hulene was increased. However, this was only learned by JET and the relevant C/Ps towards the end of 2016. A copy of the memorandum regarding this was provided to JET. The JET provided its opinion on the matter and submitted to the DPM. The JET was particularly interested in knowing the basis of the increase in the dumping fee. It was understood that the total collected revenue from fees previously set for dumping at Hulene (Mt 75 per ton) was never sufficient to cover for its operations. However, it was also noted that data on volume of waste disposed at Hulene has questionable integrity due to failures in the recording and reporting system. Thus, it is difficult to determine just how much the total collectible revenue should be. Also, the records on the utilization of rented heavy machineries has been left unchecked vis-à-vis actual performance. This results to high invoices from the contracted firm. JET analysis of past contracts, performances, records and meetings with DMSC staff revealed that it is important for the DMSC to practice more stringent monitoring and data validation activities as this would also help determine the actual funding requirements in the operations of the dumpsite. Therefore, raising fees is not always the solution to funding deficits. The JET wanted to know if there was a legislative move to amend No. 2, Article 32 of the Resolution 89/AM/2008 which stipulates on the use of the Municipal dumping site including reference to the legislated Mt 75 per ton fee, and opinionate

that a Mayor's decision on the matter (as expressed in the letter captioned) is not sufficient to make revisions in the regulation that was deliberated on and approved by the legislative body. It was likewise not expressed in the current master plan, which also was adapted and approved by the CMM council. The JET suggested that a revision of the regulation must be done, in accordance to law, to reflect the increase in the dumping fee. The method of determining any future changes in the service fee must be included in the amendment of the regulation. It was noted that the increase was 30%, from Mt 75/ton to Mt 97.5/ton. And this amount is invoiced on the licensed private service providers (PSP) utilizing the dumpsite, who, in turn make the payments through depositing directly to the CMM bank account and submitting the proof of payment to the Prova de Servico. Meanwhile, for PSPs that are unlicensed, and entities or individuals who are bringing carts to dispose their waste, they must pay at the Hulene dumpsite. However, instead of Mt 97.5 per ton, the Hulene collector takes Mt 100 per ton from these entities or individuals. This is done because, according to the Hulene staff, it is difficult for them to look for small change of Mt 2.5 every time someone pays. Although this is a small amount of money, there is unfair disparity between the relatively bigger licensed PSPs, versus the smaller entities and individuals. The JET suggested that this rounding-off must be included in the revision of the Article 32 Resolution 89/AM/2008, and should be applicable to all users of the dumpsite. Moreover, a methodology or principle on which future increases will be based must be included in the revised Regulation. It was likewise stressed that officially legislated fees be made known to the users of the facility. A simple posting of the copy of the regulation by the window of the collector at Hulene may be sufficient for the purpose.

Despite the challenges in 2016, mainly relating to lack of effective internal and external communication, more appreciation of the importance of financial management by the staff of DMSC continued to be observed on the 4th year. The Chief of Administration and Finance became more participative in meetings, including the bi-monthly meetings, and have become very helpful in the clarification of issues that arose. The JET and his office had collaborated very well in 2015 and 2016. The C/Ps also showed increased enthusiasm in preparing reports, attending meetings and supporting the JET. Other DMSC staff, such as the heads of the PdS and Supervision sections have been unwavering in their cooperation and have shown leadership in their sections, especially when the painful efforts of changing the PdS system were being undertaken. The DMSC Director, the Planning and Monitoring Chief and the other C/Ps have been very supportive in the efforts to improve the financial management of the sector.

2.3.2 Collect Periodical Data on Revenue and Expense of Solid Waste Management (Activity 3-2)

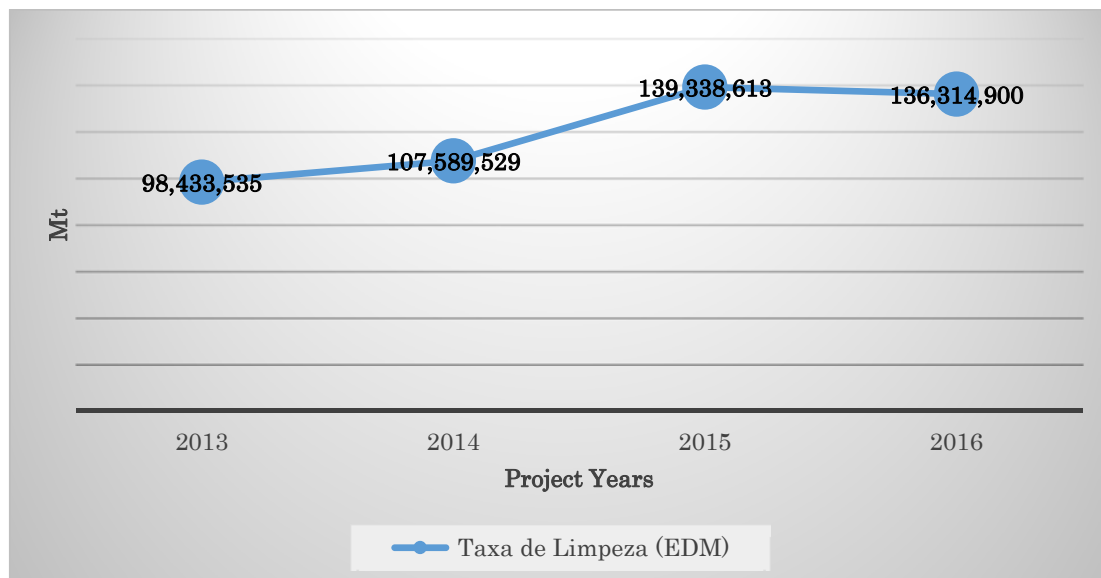
Every month, JET collects data on revenues and expenses, with the help of the C/Ps. This activity had been consistently undertaken since the 1st year of the Project. As of this report-writing, all monthly data on revenues have been collected, while the monthly data on costs are yet to be completed. Some cost data have been collected until November 2015. This acceptable delay is a tremendous improvement, from 4-months to 6-months delays experienced in the 1st and 2nd year of the Project. Table 2.48 presents the revenue collections during the project period, from 2013 to 2016.

Table 2.48 Summary of Internally-Generated Revenues Collected

Fund Sources	2013	2014	2015	2016	% of Total (2016)
<i>Internal</i>					
Taxa de Limpeza (EDM)	98,433,535	107,589,529	139,338,613	136,314,900	93%
Taxa de Limpeza (Prova de Servico)	2,370,479	1,932,069	4,203,304	6,372,371	4%
Taxa de Contrato	2,002,513	2,645,655	1,835,582	1,822,174	1%
Taxa de Tratamento (Hulene)	742,473	943,334	869,378	1,454,208	1%
Fines and Penalties	434,692	377,882	205,923	329,227	0%
Licenses	159,837	194,271	183,538	197,139	0%
Special Services	32,765	53,480	45,077	55,270	0%
Other Revenue			1,505,885	788,473	
Total Internal	104,176,294	113,736,221	148,187,299	147,333,762	100%

Source: DMSC

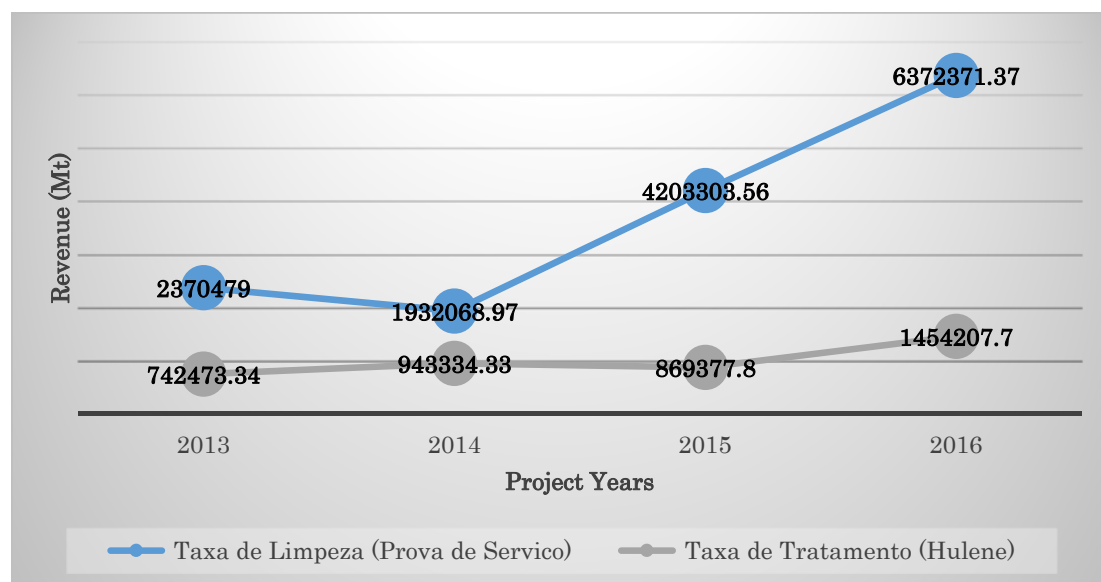
The cleaning tax collected by the EDM is still the major income of the sector, comprising 93% of all internally-generated revenues. With its far-reaching and efficient collection system where the cleaning tax from domestic and non-domestic consumers are tucked in the electric bill or pre-paid accounts, the collection efficiency of the EDM averages at 95% monthly.



Source: JICA Expert Team

Figure 2.35 Revenue from Cleaning Tax Collected by EDM

Two (2) other internally-generated revenue sources have very high potentials for growth: Hulene dumpsite fees and cleaning tax collected by the Prova de Servico (PdS).



Source: JICA Expert Team

Figure 2.36 Revenue from Cleaning Tax Collected by PdS and Dumping Fee

Meanwhile, Tables 2.49 to 2.55 present the monthly major operational cost data collected for 2016.

Table 2.49 Payments to Contract for the Collection of SWM in Maputo City, 2016

Month	Company Contracted	Mt
January	Ecolife,SA	14,435,670
February	Ecolife,SA	4,944,952
March	Ecolife,SA	4,619,183
April	Ecolife,SA	5,159,794
May	Ecolife,SA	5,012,761
June	Ecolife,SA	5,004,580
July	Ecolife,SA	4,896,027
August	Ecolife,SA	4,988,230
September	Ecolife,SA	5,187,811
October	Ecolife,SA	4,827,224
November	Ecolife,SA	(no data)
December	Ecolife,SA	(no data)
TOTAL		59,076,230

Source: DMSC

Until October 2016, Mt 59 million has been paid to the contracted company, Ecolife SA, for the collection of SWM in the Cement City.

Table 2.50 Payments to Contract for Secondary Collection in the Suburban Areas, 2016

Month	Company Contracted	Mt
January	ENVIROSERV	4,170,004
February	ENVIROSERV	4,369,214
March	ENVIROSERV	3,859,231
April	ENVIROSERV	4,582,598
May	ENVIROSERV	4,968,686
June	ENVIROSERV	(no data)
July	ENVIROSERV	(no data)
August	ENVIROSERV	(no data)
September	ENVIROSERV	(no data)
October	ENVIROSERV	(no data)
November	ENVIROSERV	(no data)
December	ENVIROSERV	(no data)
TOTAL		21,949,733

Source: DMSC

Secondary collection in the suburban areas is undertaken by the Enviroserv. Until May, a total of Mt 22 million has been paid to the company.

Table 2.51 Payments to Contracts for Primary Collection, 2015

Month	Mt
January	3,838,545
February	3,838,545
March	3,838,545
April	3,838,545
May	3,838,545
June	5,625,774
July	6,586,146
August	6,059,060

Month	Mt
September	6,269,400
October	(no data)
November	(no data)
December	(no data)
TOTAL	43,733,105

Source: DMSC

Primary collection that is being undertaken by microenterprises has been paid a total of Mt 43.7 million.

Table 2.52 Payments to Rent for Heavy Equipment Used at Hulene Dumpsite, 2016

Month	Company Contracted	Mt
January	Hidro Construction	5,298,624
February	Hidro Construction	6,220,781
March	Hidro Construction	6,261,335
April	Hidro Construction	6,530,456
May	Hidro Construction	5,874,111
June	Hidro Construction	6,601,100
July	Hidro Construction	6,130,754
August	Hidro Construction	6,814,363
September	Hidro Construction	6,362,030
October	Hidro Construction	5,324,178
November	Hidro Construction	(no data)
December	Hidro Construction	(no data)
TOTAL		61,417,732

Source: DMSC

The operations at Hulene dumpsite require heavy equipment. At the moment, the DMSC rents equipment from Hidro Construction. The total amount of Mt 61.4 million merely for rent of equipment as of November 2016 should prompt the Directorate to consider procuring its own brand new equipment that can be used in the long run.

Table 2.53 Payments to Services in the Maintenance of Vehicles, 2016

Month	Mt
January	6,440
February	55,247
March	285,405
April	309,133
May	12,285
June	-
July	18,915
August	800
September	400
October	103,307
November	-
December	-
TOTAL	791,932

Source: DMSC

Payments to services in the maintenance of vehicles has amounted to Mt 791,932. Of this, 10% was paid for by CMM funds and 90% by locally-sourced income.

Table 2.54 Payments for Campaigns and Civic Education, 2016

Month	Mt
January	-
February	70,200
March	-
April	348,075
May	-
June	24,500
July	-
August	-
September	-
October	-
November	-
December	-
TOTAL	442,775

Source: DMSC

Only Mt 442,775 was expended for campaigns and civic education, and funding all came from locally-sourced income.

Table 2.55 Payments for Fuels and Lubricants, 2016

Month	Mt
January	2,075,108
February	994,702
March	1,026,099
April	77,496
May	46,000
June	1,156,020
July	363,297
August	53,500
September	76,041
October	1,146,202
November	636,501
December	(no data)
TOTAL	7,650,967

Source: DMSC

Payments for lubricants have reached Mt 7.65 million as of November 2016.

2.3.3 Calculate annual budget and monthly expense (Activity 3-3)

As presented in the preceding sub-section, the annual financial data were calculated based on the monthly data provided by the C/Ps. A database was developed and used starting in the 1st Year and updated as monthly financial data are submitted to the project team. The database, which produces a simple model that annualizes planned and executed budgets of the DMSC, facilitates a historical comparison of the financial performance of the sector.

Table 2.56 presents the planned and executed budgets of the SWM sector from 2011 to available financial data in 2016, which includes the 4-year project period.

Table 2.56 Variance Between Planned and Executed Budgets

Budgets	2011	2012	2013	2014	2015	2016 (incomplete)
Budget Plan	348,884,277	190,504,784	182,542,249	224,780,888	267,745,368	1,093,197,202
Budget Executed	170,713,932	260,270,542	213,640,222	175,995,945	301,672,042	226,722,824
Variance						
Mt	178,170,345	-69,765,758	-31,097,973	48,784,943	-33,926,674	866,474,378
%	51%	-37%	-17%	22%	-13%	79%

Source: JICA Expert Team

Note that 2016 executed budget data has not yet been completed. As shown in the preceding table, the variance between planned and executed budgets have become smaller, over the years, from a significant difference of 51% in 2011, to only -13% in 2015. In 2016, it should be understood, and as mentioned in the first part of the report, that a capital investment budget amounting to Mt 870 million pertaining to the cost of construction of the sanitary landfill in Mathlamele. The project was not pursued due to land issues, thereby impacting on the budget execution for the year.

In 2016, actual budget executions were affected by several factors. One of this is the realization of the proposed budget, that is mostly reliant on generated revenue for the year. This is why the ability to quickly respond to operational challenges that would affect revenues are very important. The DMSC should have sufficient free hand to allocate money to quickly fix problems. To reiterate also what has been observed in the first three years, when some personnel have become suspicious in certain activities or dealings that require the use of money, the DMSC should be able to wield enough political will to check and correct misbehavior. On the other hand, it should be quick to appreciate and motivate good working staff by using appropriate and available economic or non-economic incentives. This way, the inflow of money is facilitated, while the outflow of money is ensured to be effective. Also, it was in this year that the country experienced painful macroeconomic shocks, brought about by the decline in the value of the meticaís with respect to foreign currencies. The country, which is heavily import-dependent, experienced an all-time high 26.35% inflation by November 2016, affecting normal business transactions.

2.3.4 Develop Annual Financial Report (Activity 3-4)

The JET has collected and organized the monthly and annual financial reports of the DMSC from 2010 to 2016. Until 2015, or the 3rd year of the project, data on revenues and costs have been completed. For 2016, however, actual costs expended are yet to be provided to JET. Every year, an annual financial report is provided and discussed with the DMSC to show how the directorate has performed. However, JET, together with the C/Ps, has developed an Annual Report 2015 that is narrative as much as numerical. Because it was very challenging to balance the budget given the manner that the raw financial data were organized by the DMSC, it took quite a while to accomplish this.

The 2015 Annual Report, the draft of which was completed on 2016, not only presented the financial data in tabular form, it likewise provided analysis and explanations on how the performance of the sector went for the year, in terms of finance. Certain detailed analysis were provided, to answer questions such as why the revenue from dumping fees do not equate to the total garbage dumped at Hulene or for what activities does budget for fuel support. The FS does not have detailed recording on expenses per activity. For example, fuel and lubricants are simply recorded and lumped as such. From various discussions with the finance section, it was acknowledged that segregating costs according to major activities as collection and transportation, Hulene dumpsite operations, administration, and planning and monitoring, will make it easier to analyze whether money is used efficiently, or is able to achieve targets. Hence, such segregation is slowly being done. The JET devised recording worksheets that classifies expenses and revenues according to DMSC's major activities.

The Annual Financial Report contains a segregation of revenues and costs in the preceding fiscal year. The draft outline which was developed in November 2014 was provided in the 2nd Progress Report. As estimated

on the 3rd year, this narrative report was done in 2016. Nonetheless, the numerical annual financial report was accomplished, as done yearly.

2.3.5 Develop annual budget planning (Activity 3-5)

In the 1st year of the Project, the DMSC budget was already being implemented, thus, helping to rectify shortfalls or over-budgeting was a challenge. In the 2nd year of the project, the JET made it a point to observe the procedure for budget planning that is being undertaken by the DMSC. From these observations, a plan of action was devised, in collaboration with the DMSC, particularly with its finance section, which was implemented in the 3rd year of the Project. On the 4th year, the activity and budget planning method was enhanced. The process was done by the DMSC themselves.

When the annual budget planning method was devised, the JET discussed with the Directorate the basic ingredients to a good budget plan. In summary, a sound budget plan must be based on the following:

- Clear understanding and appreciation of the overall goal of the organization
- Clear understanding of own roles and responsibilities, as well as how an individual or department is linked with another individual or department
- Thorough evaluation of past performance versus targets
- Time-bound
- An understanding of present conditions: statistics on waste generation, size of the sector (domestic and non-domestic population), etc. must be on-hand and this underscores the important role of the Department of Planning and Monitoring in the whole budget process
- A set of realizable targets that are based on present conditions
- Properly identified and agreed on activities to meet targets
- Sound estimate of requirements to conduct activities (equipment, supplies, manpower, time, technical skills, etc.)
- Recognition of available resources and limitations
- Cost estimates based on market price

From these basic requirements, the Activity and Budget Planning Template was devised. In July to August 2015, a series of workshops were conducted in the use of the template, to facilitate the budget planning for 2016. The exercise was repeated in 2016, for the 2017 budget proposal.

The template required the department, section or unit to identify its objectives, and set the targets related to them for 2016, as well as verifiable indicators to see whether the targets were met. This underscored the importance of having a set of activities and corresponding budgets that are aligned to what needs to be achieved. The workshop enjoined chiefs and staff of different departments and units at the directorate and were grouped per session. As mentioned, the objectives, targets and verifiable indicators per department were first identified by chief, together with his or her staff. The usual expectation for this first activity was that it would take less than an hour, assuming that everyone is well aware of their departmental mandate and could clearly and easily put it in writing. As experienced on the 3rd year, this, however took much longer. This is because the Directorate had been so involved in its daily or short-term operations and resolving challenges that require urgent attention and thus found lesser time discussing objectives and targets. It was observed that participants were so enthusiastic discussing what and how they perceive their departmental objectives were but agreeing and putting them in writing that is concise was the challenge. On the 4th year, identification of their objectives for the year became relatively faster.

The proposed budget for 2017 is shown in Table 2.57 The planned investment of the CMM for the sanitary landfill in Mathlamele was not included in the proposed 2017 budget from the DMSC.

Table 2.57 Proposed Budget for 2017

Budget	2017
1.0. Current Expenses	231,065,870
1.1. Personal Services	28,106,012
1.2. Goods and Services	191,061,041
1.4. Current Transfers	9,894,868
1.6. Terminal service	2,003,949
1.7. Other Current Expenses	-
2.0. Capital Expenses	26,113,000
2.1. Capital Goods	26,113,000
2.2. Capital Transfers	-
2.3. Financial Costs	-
TOTAL PROPOSED BUDGET	257,178,870

Source: JICA Expert Team

2.3.6 Review the Solid Waste Service Fee (Activity 3-6)

The City Council of Maputo has been charging fixed monthly cleaning fee based on three levels of energy consumption for domestic and non-domestic waste generators. The fees are automatically collected through the monthly electricity bill, and collected by the Electricidade de Mocambique (EDM), whether the consumer has a postpaid or prepaid account

Collection of the cleaning tax from domestic waste generator, or households, is made easy thru automatic inclusion in the electricity bill by the electricity company.

The current fees are based on consumption levels low, medium and high and presented in the table below.

Table 2.58 Cleaning tax fees for Domestic Waste Producers Automatically Added into Monthly Electricity Bill

Electricity Consumption per Month	Corresponding Monthly Cleaning Fee
From 0 to 200 kWh/month	Mt 45
From 201 to 500 kWh/month	Mt 75
More than 500kWh/month	Mt 110

Source: JICA Expert Team

Meanwhile, non-domestic waste generators pay higher waste generation fees because the high volume waste produced are byproducts of their business activities from which they earn profit or achieve their particular socio-economic objectives.

The non-domestic waste generators are classified according to their activities (restaurants, hotels, private offices, social and public institutions, etc.) with estimated daily waste generation based on their scale of operations. They are then categorized according to total daily waste production with corresponding total monthly cleaning fee, as presented in the succeeding table 2.59.

Table 2.59 Total Cleaning tax fees for Non-Domestic Waste Producers Monthly

Category	Estimated Daily Waste Production	Corresponding Monthly Cleaning Fee
A	Up to 700 kg or 2000 liters	Mt 5,200
B	Up to 350 kg or 1000 liters	Mt 2,600
C	Up to 200 kg or 500 liters	Mt 1,300
D	Up to 100 kg or 250 liters	Mt 650
E	Up to 25 kg or 50 liters	Mt 325
F	Hospitals and public health units	Exempted

Source: JICA Expert Team

A portion of the total monthly fee as captured by the EDM based on their electricity consumption, broadly categorized as low, medium, high is shown below.

Table 2.60 Cleaning fees for Non-Domestic Waste Producers Automatically Added into Monthly Electricity Bill

Category	Electricity Consumption per Month	Corresponding Monthly Cleaning Fee
Low Consumption	Up to 200 kWh	Mt 80
Medium Consumption	201 – 500 kWh	Mt 160
High Consumption	More than 500 kWh	Mt 250

Source: JICA Expert Team

An assessment of the cleaning was conducted on the 4th year of the project and key points were:

A) Fixed cleaning fees per interval are inequitable/unfair.

- At the moment, the structure of fees is not equitable among constituents with different economic statuses. For example, a regular household consuming 50kWh per month has to pay the same cleaning fee of Mt 80 as a household that consumes 200 kWh --- which is already high, in Maputo, given the average household income levels. However, a household that exceeds 200 kWh by only 1 kWh has to pay the next fee level of Mt 160, or 50% more. This fee level applies to households consuming up to as much as 500kWh. Between 201 kWh to 500kWh, the discrepancy in terms electricity consumption is huge. With the same fee structure, this is also seen on non-domestic waste generators. There is a need to determine a cleaning fee that is equitable/fair, especially since the CMM aims to socialize fees.

B) Fixed cleaning fee per interval does not optimize revenue generation.

- A numerical exercise was conducted to illustrate how fixed cleaning fees will not maximize revenues. Table 2.61 shows potential revenue given the current fee structure, while Table 2.62 shows how revenue can potentially go up using a unit price multiplied by actual electricity consumption. The challenge was to find the value of unit cleaning fee that will optimize revenue.

Table 2.61 Current Fee structure with Fixed Rate:

Electricity Consumption Intervals	Assumed Average Monthly Consumption (kWh)	Fixed Rate (Mt/month)	Assumed Number of Households	Revenue (Mt/month)
	A	B	C	D = B * C
0 to 200	100	47	100	4,700
201 to 500	300	75	100	7,500
501 upwards	700	110	100	11,000
Total			300	23,200

Source: JICA Expert Team

Table 2.62 Sample Fee Structure with Unit Rate

Electricity Consumption Intervals	Assumed Average Monthly Consumption (kWh)	Assumed (Arbitrary) Unit Rate (Mt/kWh)	Monthly Cleaning Fee (Mt)	Assumed Number of Households	Revenue (Mt/month)
	A	B	C = A * B	D	E = C * D
0 to 200	100	0.2	20	100	2,000
201 to 500	300	0.25	75	100	7,500
501 upwards	700	0.3	210	100	21,000
Total				300	30,500

Source: JICA Expert Team

C) Basis for unit pricing of solid waste management.

- There is need to link waste generation with electricity consumption to make the cleaning fee more believable. At the moment, the rationale for tucking the cleaning fee to the monthly electricity bill is to ensure the efficient collection of the payments by the CMM. EDM has a well-established payment and collection system that has a strong enough disincentive for domestic and non-domestic consumers not to default in their monthly payment. It is also assumed that higher electricity consumption translates to higher economic status or capability, and therefore the fixed flat rates are higher as the electricity consumer/waste generator goes up on the 3-tiered echelon. It was important to determine a cleaning fee that has a clear link and rationale between waste generation and electricity consumption.

D) Determination of intervals is not clear.

- The EDM categorizes its consumers (both domestic and non-domestic) according to the following:
 - Low: 0 to 200 kWh/month
 - Medium: 201 to 500 kWh/month
 - High: 501 kwh, and over, per month.
- It is in the interest of the study to determine the basis for these intervals. About 52% of the population lived below the poverty line in 2009⁵ in Mozambique and only 20% the total households in the country has access to electricity in 2015⁶, albeit in Maputo City, EDM reports over 90% electrification. Data from the World Bank in 2013 also reveals that per capita electricity consumption is only 436kWh per year or 1.19kWh per day. Compared to the world statistics of per capita average electricity consumption of 3100kWh in the same year, or 8.49kWh daily, the Mozambican daily average is seven times lower. In this sense, the intervals set by the EDM, and which is also followed by the CMM in setting its cleaning fee levels, need to be reviewed.
- To illustrate: assuming that a typical household in Mozambique is composed of 6 members, its daily electricity consumption may be 7.167kWh daily (from 1.19kWh/day x 6 members) or 215kWh monthly (7.167kWh x 30 days). This simplified calculation results to a value that is at the lower boundary of the middle echelon. It is probable that average monthly electricity consumption of many households fall below this value. It is probable that the median is near the value of 215kWh. It is probable that the 500kwh monthly consumption, which is the upper boundary of the 2nd level of consumer classification is a bit too high, especially considering the socio-economic conditions of households in Mozambique. It may however be applicable to non-domestic electricity consumers/waste generators. The JET believes that there is a need to determine a categorization of electricity consumers, who are also waste generators, that should closely mirror the correct socio-

⁵ https://www.cia.gov/library/publications/the-world-factbook/geos/print/country/countrypdf_mz.pdf

⁶ https://energypedia.info/wiki/Mozambique_Energy_Situation

economic realities of domestic and non-domestic constituents of the City, and which the electricity consumption and waste generation patterns may also be reflected. Or, to provide a rationale that the echelons are actually not necessary.

- By finding the relationship between waste generation and electricity consumption, and using latest data or estimates available, it was determined that on the average, domestic electricity consumers generate 0.70kg of waste per kWh of electricity consumed, while commercial electricity consumers generate 1.84kg of waste per kWh of electricity consumed. It was also determined that in terms of cost of managing the solid waste of the City, Mt 0.69 is spent per kg of waste. The waste generation per electricity (kg/kWh), and the cost of SWM per kg (Mt/kg), were combined to determine the cost of waste that is generated per electricity consumed (Mt/kWh). For domestic consumers, this was calculated to be 0.49 Mt/kWh and for non-domestic or commercial consumers, this was 1.28 Mt/kWh.
- Waste generation in Maputo City was estimated to be 1,190 tons per day⁷, of which 67% is domestic, and 33% is non-domestic. This translates to a total of 434.35 million kg of garbage generated in a year. EDM also reports that the City's total electricity consumption was 489.95 million kWh in 2012, of which 84% was consumed by domestic connections and 16% by non-domestic connection. Using these figures, the waste generation per energy consumption was derived, as shown in Table 2.63.

Table 2.63 Derivation of Unit Cost of SWM with respect to Energy Consumption

Parameter	Unit	Domestic	Non-Domestic	Total
Waste Generation	Kg/year	289,810,000.000	144,540,000.00	434,350,000.00
	%	66.72	33.28	100.00
Electricity Consumption (2016)	kwh/year	411,377,000.00	78,573,000.00	489,950,000.00
	%	83.96	16.04	100.00
Waste Generation per Energy Consumption (2012)	Kg/kwh	0.70	1.84	2.54
Cost of SWM (City Budget, 2015)	Mt/year	202,120,268.14	99,551,733.86	301,672,042.00
Unit Cost of SWM	Mt/kg	0.69	0.69	0.69
Cost of SWM per Energy Consumption	Mt/kwh	0.49	1.28	

Source: JICA Expert Team

The calculation of the unit cost of SWM per electricity consumed was based on the following assumptions:

- Higher-income households (or establishments, in the case of large waste producers) have more electric appliances and therefore consumes more electricity compared to households (or establishments) with lower income. Electricity consumption is a sound proxy for income;
- Electricity consumption, being a proxy for income, is also a good indicator for economic activities. Economic activities translate to waste generation. The more economic activities, the more waste is produced;
- Cost of SWM must be shared among waste generators, and government, at equitable but optimum levels.

These unit costs relate waste generation, electricity consumption (which is a good proxy for income), and actual cost of waste management. The unit cost of 49 Mt/kWh for domestic consumers and 1.28 Mt/kWh for non-domestic or commercial consumers were used to determine the total cleaning fee per month, which is based on actual electricity consumption.

For the domestic waste generators, policy options for the CMM as to the level of imposition of the fee can be from 80% up to full cost (100%), which is the 0.49 Mt/kWh for the domestic consumers. The 80% policy corresponds to a value (0.39 Mt/kWh) that is close to the unit price being paid by the low consumers in the

⁷ JET estimate for 2017

existing fee structure (0.45 Mt/kWh). However, it is recommended that the full cost of 0.49 Mt/kWh be imposed. The impact of the full cost is only 16% of an assumed average CREDELEC value (pre-paid account) of Mt 1,500 per month. This full cost also takes up only 3.4% of the average household monthly budget in Maputo City, as shown in Table 2.64

Table 2.64 Impact of New Cleaning Fee to Domestic Consumers

	@80%	@ Full Cost
CREDELEC per month (Mt)	1,500	1,500
Electricity consumption (kWh)	482	482
Cleaning fee	189	236
% of CREDELEC	13%	16%
Net electricity	422	406
Proportion to average HH Budget ⁸	2.7%	3.4%

Source: JICA Expert Team

To reiterate, the recommended unit cleaning fee for domestic waste producers is 0.45 Mt/kWh, and should be adjusted by about 35% every three years to correspond to price fluctuations in the market and the increasing funding requirement of the SWM. This periodic increment should be adjusted depending on possible price level shifts in the future due to unanticipated economic shocks.

Meanwhile, for non-domestic waste generators, they pay higher waste generation fees because the high-volume waste produced are by-products of their business activities from which they earn profit or achieve their particular socio-economic objectives.

As with the domestic cleaning fee, by finding the relationship between electricity consumption and garbage generation, and then cost of solid waste management in Maputo City, the rational cleaning fee was derived. The calculated per unit cleaning fee for non-domestic waste generator was 1.28 Mt/kWh.

As demonstrated in Table 2.65, policy options for the CMM as to the level of imposition of the fee can be from 60% up to full cost (100%), which is the Mt 1.28/kWh for the domestic consumers. The 60% policy corresponds to a value (0.77 Mt/kWh) that is close to the unit price being paid by the low consumers in the existing fee structure (0.80 Mt/kWh). However, the recommended cleaning fee level is 80% of full cost or 1.02 Mt/kWh. The impact of the full cost is 41% of an assumed average CREDELEC value (pre-paid account) of Mt 1,500 per month.

The fee should be adjusted by about 35% every three years to correspond to price fluctuations in the market and the increasing funding requirement of the SWM. This periodic increment should be adjusted depending on possible price level shifts in the future due to unanticipated economic shocks.

⁸ Mt 6,924 based on “The Household Budget and Expenditure Data Collection Module (IOF 2014-2015) within a Continuous Multipurpose Survey System” of National Institute of Statistics or Instituto Nacional de Estatística (INE) and cited in <http://macauihub.com.mo/2016/01/06/families-in-mozambique-spend-us147-per-month/>

Table 2.65 Impact of New Cleaning Fee to Non-Domestic Consumers

	@60%	@80%	@ Full Cost
CREDELEC per month (Mt)	1,500	1,500	1,500
Electricity consumption kwh	482	482	482
Cleaning fee	370	493	616
% of CREDELEC	25%	33%	41%
Net electricity	363	324	284

Source: JICA Expert Team

There were four policy mix scenarios checked for the cleaning tax of both domestic and non-domestic waste generators, and the business-as-usual (BAU) or baseline case:

Table 2.66 Cleaning Fee Policies Checked

Type of Consumer	Condition	Cleaning Fee (Mt/kWh)
Domestic (DC)		
Policy A	80% full unit cost	0.39
Policy B	100% full unit cost	0.49
Non-Domestic (Non-DC)		
Policy A	60% full unit cost	0.77
Policy B	80% full unit cost	1.02
Policy C	100% full unit cost	1.28

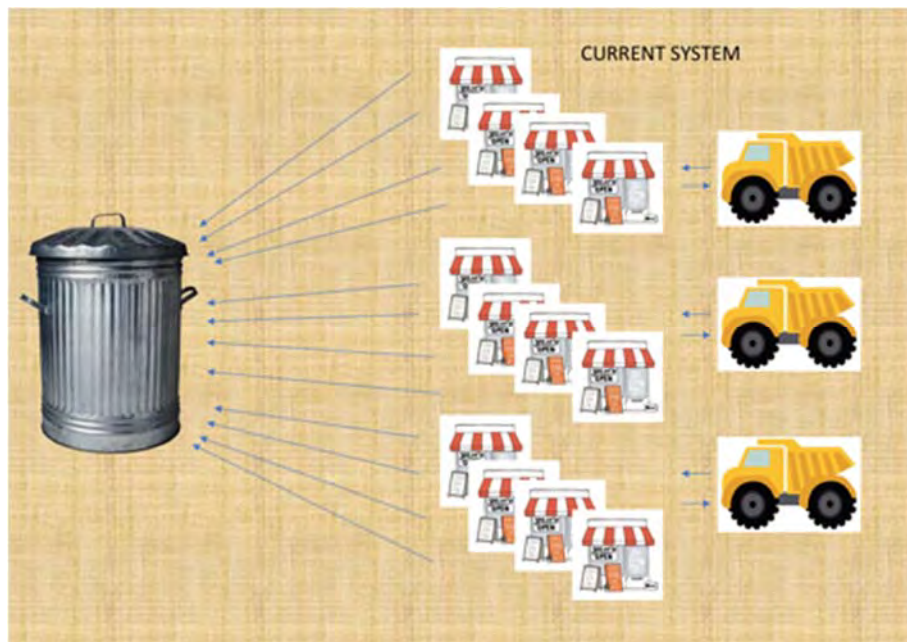
Source: JICA Expert Team

The mixes where:

- Scenario 1: DC Policy A + Non-DC Policy A,
- Scenario 2: DC Policy B + Non-DC Policy A,
- Scenario 3: DC Policy B + Non-DC Policy B, and
- Scenario 4: DC Policy B + Non-DC Policy C.

These policy scenarios were suggested in the Masterplan and in the Financial Operations Guidelines.

The current payment method of cleaning tax by large waste producers is depicted in the succeeding Figure 2.37. The main issues in the current system is the resource-intensive invoicing of large waste producers and the manual distribution of the invoices by Supervisors. With an aggressive registration of large waste generators by the DMSC, from only 800 in 2014 to about 5,500 by mid 2016, it has become more and more challenging to monitor the payments, and also to ensure compliance.



Source: JICA Expert Team

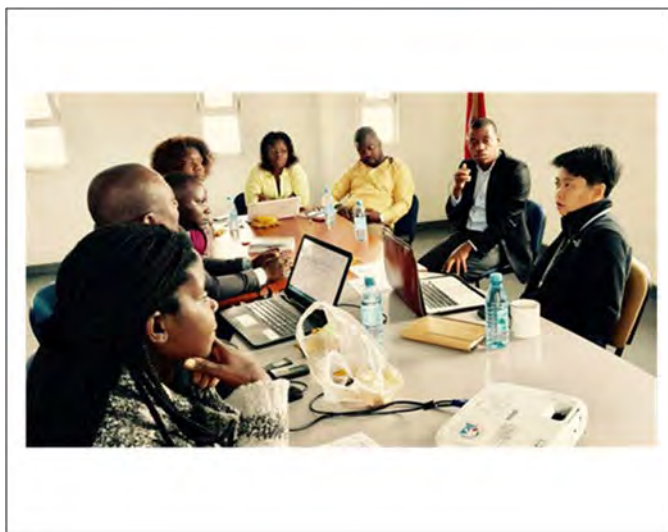
Figure 2.37 Current System of Imposing Cleaning Fee from Large Waste Generators

To address the limitations of the current system, an online, market-driven system must be put in place instead. This system is depicted in the succeeding Figure 2.38, and is a result of a series of workshops involving core staff of the Directorate.



Source: JICA Expert Team

Figure 2.38 Proposed System of Imposing Cleaning Fee from Large Waste Generators by the Revenue Office of DMSC: Online, Market-Driven Method



Source: JICA Expert Team

Figure 2.39 One of the 3 workshops conducted by the SWOT Core Group discussing alternative methods of cleaning tax payments for large waste generators, dated Nov. 15, 2016

The proposed system involves upgrading of the existing IT system of the DMSC lodged at and managed by the Proof of Service. This database will be shared with the Revenue Office of the Finance Section and will be able to do online invoicing and monitoring of the large waste generators, among other things. This system upgrading will be done in the interim phase, or first 5 years, of the 10-year Masterplan period which should also be able to increase the revenue base by more aggressive registration of businesses and institutions in the system. From 6th year onwards, or hopefully, earlier, the full concept phase shall be rolled-out.

The full-concept phase is a completely transitioned system, from the old system of having the Directorate directly (and inefficiently as well as ineffectively) monitor the compliance of the large waste generators in the payment of the fee, to a system that allows the market to correct itself. This will be done by tapping the private service providers (PSP) that collect and transport waste. The large waste generators, by this time, must have their own PSPs as imposed by existing regulations. The cleaning fee will be tucked under the contracts between the PSP and the large waste generator. The PSP will then remit this payment to the Revenue Office of the DMSC through its license fee. However, unlike the license fee that must be fully paid at one time (start of the year), the remittance of the cleaning fee may be done annually, semi-annually, or quarterly. Incentives may be thought of to encourage one-time full payment.

This way, instead of having to invoice and monitor thousands of large waste generators for compliance, the Revenue Office, in partnership with the Proof of Service and the Supervisors, will only have to invoice and monitor a hundred or so registered PSPs. What is critical here is ensuring that transparency is strongly imposed on the PSPs with regards to their clientele. Registration of the large waste generators must still be continued and periodically updated in the database to cross-validate contracts with PSPs, and estimate waste generation in the private sector, among other things of interest.

2.3.7 Develop the Action Plan for improvement of the financial management (Activity 3-7)

There were several changes proposed in the Masterplan and the Financial Operations Guidelines to achieve the 10-year program. First, an organizational change in the Financial Section will be necessary, and should be done by 2017. This includes creating the subsections of Budget, Revenues and Accounting, putting the right number and skilled staff in place, and clarifying/correcting the roles and linkages with other sections of the directorate. Activity and budget planning activities must be done yearly, and as scheduled, based on the Financial Operations Guidelines. Collection of monthly data on revenues and costs must be continued using the models established for the DMSC, until a more facilitative and responsive model is devised.

As regards to policies, discussions and agreements must be reached in the short-run. The changes in fees and method of collecting them must be in place within 2017 to 2019, the latest. By mid-term, the DMSC must have rolled-out the market-oriented, online payment method for the cleaning tax imposed on the large waste generators. This is a crucial set of activities and policy changes to cushion the financial impact of the anticipated operation of a sanitary landfill by 2021. In this regard, also, it is important for the CMM to hold detailed analysis, evaluation and have a good understanding on the costs and proposed operations/management scheme of the sanitary landfill.

Table 2.67 Summary of Action Plan for Financial Management

Actions taken 2017 to 2021	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Institutional										
Improvement in Financial Section Organization										
Financial Operations-Related										
Annual exercise of activity and budget planning										
Annual Financial Reporting										
Monthly collection and analysis of data using										
Landfill-related										
Cost estimation, analysis, and evaluation of sanitary landfill										
Cost estimation on transport and collection due to sanitary landfill										
Discussions and agreements on operational plan /management of sanitary landfill										
Estimated operations of landfill (if pursued)										
Improvement in Revenue Mechanisms										
Interim										
Full Market-Oriented, Online Payment										
Increase in fees										

Source: JICA Expert Team

2.4 Activities for Output 4

2.4.1 Review the current situation of recycling activities (Activity 4-1)

1) Identification of recycling entities

As the result of the documentary and field surveys conducted under the Project, the entities shown in Table 2.68 were identified as recycling entities in Maputo City.

Table 2.68 Identified Recycling Entities in Maputo (as of 2014)

Category	Entity	Outline
Collector	COMSOL	A cooperative collecting or purchasing recyclables for sale for the socio economic benefit of the members.
	Informal/formal collectors	Person or group collecting recyclables by informal or other manners.
Trader	AMOR	Association promoting recyclable trading with social impact in Mozambique.
	PAGALATA	Private company trading recyclables in Mozambique and exporting to Republic of South Africa.
Recycler	RECICLA	Association recycling waste plastics into bags and buckets.
	FERTILIZA	Cooperative recycling organic waste into compost
	AGRIPLUS	Private company recycling waste plastic into domestic appliances
	INDUSTRIA PLASTICA JH, LDA	Private company recycling waste plastic into plastic bags.
	FACOBOL	Private company recycling waste plastic into plumbing and agriculture pipes
	FAPACAR	Private company recycling waste paper.

Source: JICA Expert Team

2) Recycling item handled by recycling entities

As the result of the surveys conducted under the Project, the handling items of the identified recycling entities were confirmed as shown in Table 2.69.

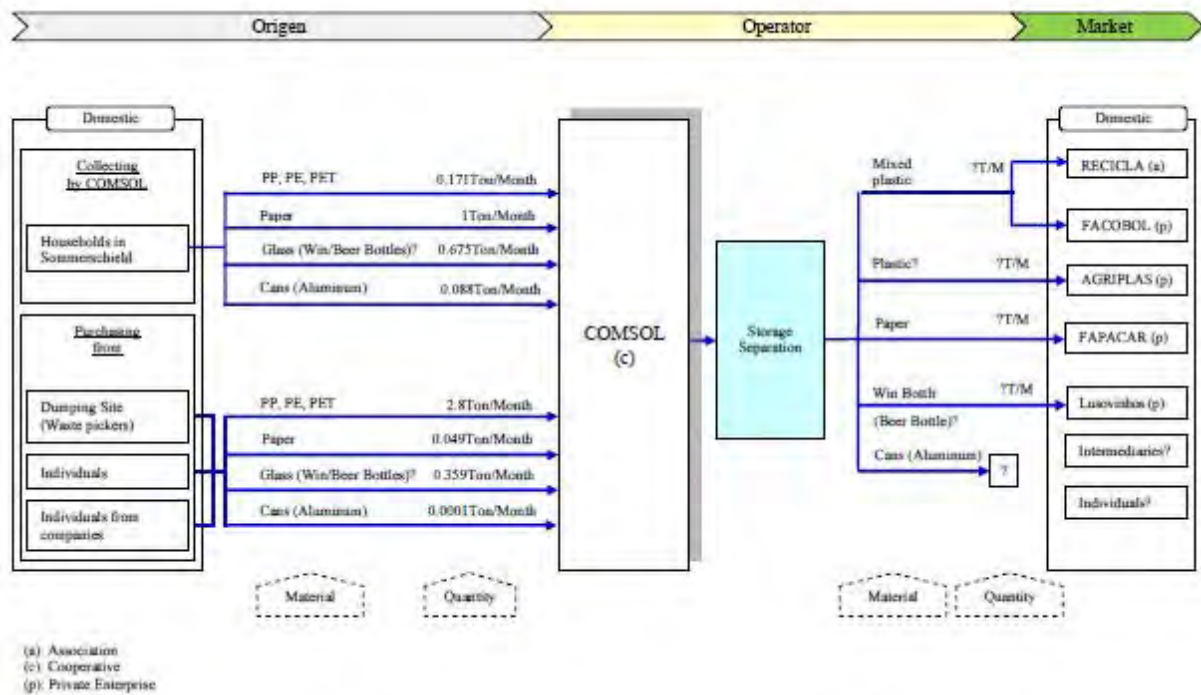
Table 2.69 Handling Recycling Items by Recycling Entities in Maputo (as of 2014)

Entity	Handling Items
COMSOL	Plastics (PP, PE, PET), Paper, Glass, Metal (Aluminum can)
AMOR	Plastic (HDPE, LDPE), Paper (cardboard, white paper), Glass (CDM and other bottles), Metal (Aluminum can), etc.
PAGALATA	Plastic (HDPE, LDPE), Paper (cardboard, white paper), Glass (CDM and other bottles), Metal (Aluminum can), etc.
RECICLA	Plastics (HDPE, LDPE, PP)
FERTILIZA	Organic waste (kitchen waste)
AGRIPLUS	Plastics (HDPE, LDPE, PP)
INDUSTRIA PLASTICA JH, LDA	Plastics (HDPE, LDPE, PP)
FACOBOL	Plastics (PE)
FAPACAR	White mixed paper, Cardboard

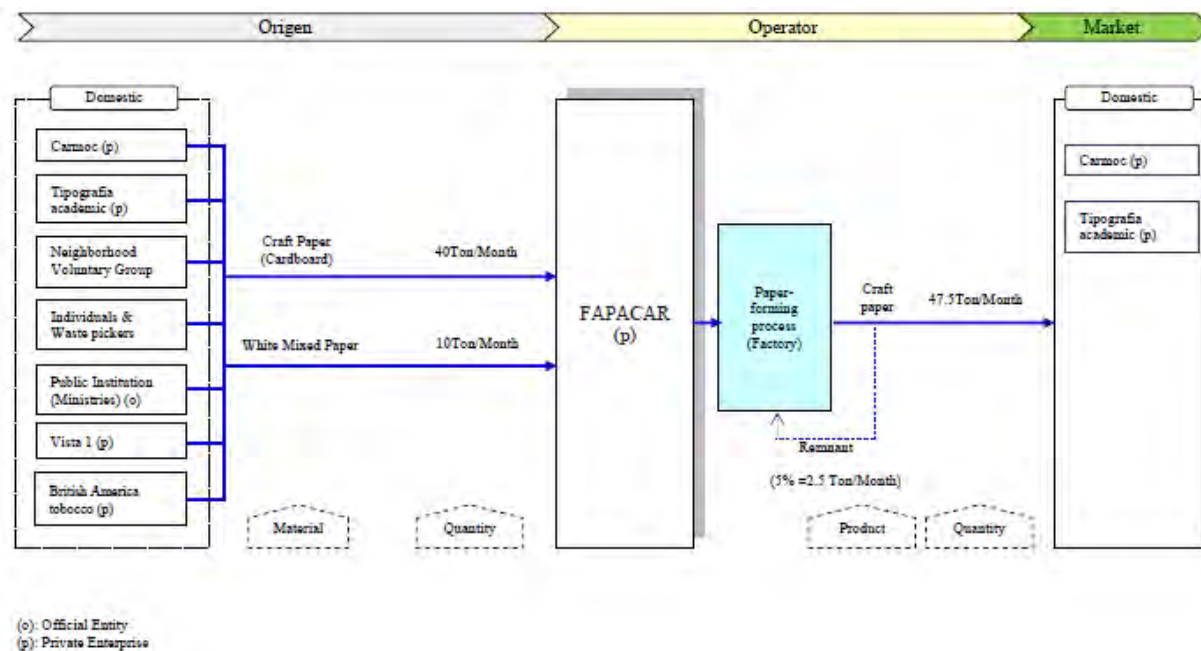
Source: JICA Expert Team

3) Material flow of recyclables

As the result of the surveys conducted under the Project, material flow of each recycling entity was summarized and its examples are shown in Figure 2.40.



Example of Collector/Trader Flow



Example of Recycler Flow

Source: JICA Expert Team

Figure 2.40 Example of Material Flow of Recycling Entities in Maputo (as of 2014)

4) Purchasing price of recyclables

As the result of the surveys conducted under the Project, purchasing price of recyclables in 2013 was confirmed as shown Table 2.70.

Table 2.70 Identified Recyclers and Purchasing Price (as of 2013)

Item	Pagalata	AMOR	Agriplus	Recicla	Comsol
Paper	1.0 Mt/kg	0.85 Mt/kg			
Cardboard	0.5 Mt/kg	0.3 Mt/kg			
PET	3.0 Mt/kg	1.2 Mt/kg	5-6 Mt/kg	4.0 Mt/kg	3.0 Mt/kg
HDP					
LDP					
CDM glass bottle	7.0 Mt/kg	3.5 Mt/kg			3.5 Mt/kg
Other glass bottle					7.5 Mt/kg (Wine bottle)
Tin can	1.2 Mt/kg	0.65 Mt/kg			
Aluminum can		7.0 Mt/kg			

Source: JICA expert team

2.4.2 Study possibility for recycling of materials (Activity 4-2)

By referring to the current situation of recycling activities in Maputo City, the potential materials for recycling, which were paper (paper and cardboard), plastic (HDP and LDP), glass (non-broken and broken) metal (aluminum, tin, steel, etc.) and organic (food leftover, etc.) were identified. However, It should be noted that feasibility of recycling will be very much affected by factors such as recycling activity's framework, recycling market situation. Therefore, it was acknowledged among the counterparts that when developing a plan for recycling activity, its feasibility shall be examined by taking those factors into account.

2.4.3 Review and improve public awareness raising programs for 3R introduction (Activity 4-3)

At the beginning stage of the Project, reviews of the existing civic education activities were carried out in order to understand the existing issues related to the planning, implementation, and evaluation of public awareness raising activities. In addition, a social survey was carried out to understand the communication methods by the citizens, the awareness of communication tools implemented by DMSC, and the communication tools used by NGOs.

After the reviews, it was found that two sections in Department of Monitoring and Planning had been implementing civic education activities in DMSC, that is; 1) Section of Monitoring and Quality Control (RMCQ), and 2) Section of Supervision.

RMCQ had conducted the annual civic education program related to solid waste management at schools, neighborhoods (Bairros), and public and private institutions since 2008. There was an attempt to formulate the Strategy of Civic Education, but the Strategy had not been finalized -by the time of review-, and the existing -former- M/P was the only guiding plan in DMSC.

On December 2013, the Office of Civic Education and Environmental Promotion (GECPA) was established, which became responsible for civic education activities in DMSC.

Based on the above review, the JICA expert team suggested the following approaches for the improvement of civic education activities:

- Formulation of a strategic plan for civic education on urban solid waste management and 3R introduction, and implement the activities based on this plan; and
- Establishment of a monitoring system for civic education activities, and evaluate the methods used for civic education.

Details of the approaches are described in below:

1) Strategic Plan of Civic Education

The formulation of the Strategic Plan of Civic Education with regard on solid waste management and 3R concepts introduction was conducted in relation with the activities of Output 4, aiming to strength the capacity of DMSC for planning, conducting, and evaluating the civic educational activities.

Following the aforementioned direction, opinions on the basic concepts for its formulation were exchanged with the Counterparts of GECPA.

The main objective of this Strategic Plan of Civic Education consisted on to serve as the guide for planning activities of DMSC in order to encourage the participation of residents, community organizations and the private sector in the management of solid waste focused on 3R concepts application.

1-1) Criteria for preparing the Strategic Plan of Civic Education

The criteria for drafting the document encompassed concerned directions considered in the revised Master Plan: Management of Urban Solid Waste in the City of Maputo (Master Plan), as those as inherent stipulations on the current legislation such as the Ordinance on Cleaning of Urban Solid Waste of Maputo Municipality (Maputo Municipality Resolution -MMR- No. 86/AM/2008), Regulation on the Supervision of Cleaning Activities of Maputo Municipality (MMR No. 87/AM/2008), Regulation on the Components of Cleaning of Maputo Municipality (MMR No. 89/AM/2008), and Organizational Statute of the Technical and Administrative Services and the Personnel Number of Maputo Municipality (MMR No. 50-AM-2010).

Furthermore, because of rigorous extension on 3R concepts is missing on the existing legislation, an introductory approach on the matter were considered. In addition, the situational features gathered as a result of aforementioned Social Survey were considered for determining priority issues.

1-2) Consistency with the Master Plan

The Master Plan is the basic legal instrument for the strategic planning which oversees the Municipal Cleaning Services of Maputo Municipality. The Master Plan sets the subjects and objectives for the development of the cleaning service, on the basis of use and systematization of available information and analysis of the situation. This process results in a definition of a coherent and sustainable strategy for the future development of the Solid Waste Management in Maputo City.

The Master Plan cited that the Municipal Council requires a strategy of civic education in the area of urban solid waste management. The need for this strategy arose from the recognition on the necessity of dissemination of information on the concerned legislation to the residents. With this premise in mind, the proposed means are to the extent possible, and easily understood messages, initially with a clear focus on transmission of components of solid waste management, calling for individual and community-level attitude redress. For this purpose, communication and education are addressed in broadest and widest sense, as a means to promote and facilitate knowledge enhancement and behavior change.

1-3) Focusing on the implementation of stipulations on legal framework

The Chapter VI of Maputo Municipality Resolution (MMR) No. 86/AM/2008 stipulates on issues regarding information, education, and awareness of the residents with respect of solid waste management. In fact, the main stipulations are:

- Maputo Municipal Council shall carry out all actions to inform residents and public and private entities that generate or handle urban solid waste, on the provisions of this Regulation (MMR No. 86/AM/2008);
- The Maputo Municipal Council is also obliged to respond properly and promptly to any request for relevant information that is sent to it, using all appropriate means and channels of information necessary for wide dissemination;

- The terms and conditions for the dissemination of information should be defined in the Regulation on Information, Education and Awareness of Residents;
- The Maputo Municipal Council, in close cooperation with educational and research institutions, nongovernmental organizations, and public and private entities, shall perform all actions aimed at the education and awareness of residents for special care to be taken onto the components of the Maputo Municipality Cleaning System;
- The use of education and awareness campaigns for residents will be required from the moment the market is receptive to collaborate on activities for urban solid waste reuse/recycle;
- The education campaigns shall be carried out using all necessary means and channels to changing attitudes and should use clear messages on their objectives using as well as pedagogic tools; and
- The terms and conditions for the dissemination of education should be defined in the Regulation on Information, Education and Awareness of Residents in the area of Maputo Municipality Cleaning System.

As shown, MMR No. 86/AM/2008 provides general instructions on the management of information, education, and awareness inherent to solid waste management and also is calling for the enactment of the Regulation on Information, Education and Awareness of Residents applicable in the area of Maputo Municipality Cleaning System. In that sense, the drafting process of the Strategic Plan of Civic Education dealt with the missing said Regulation and the general provisions referred by MMR No. 86/AM/2008.

Concomitantly, MMR No. 87/AM/2008 stipulates on the supervision of cleaning activities of Maputo Municipality. It instructs that all residents should cooperate in carrying out supervision on cleaning activities, informing to Maputo Municipal Council the infringements. The Regulation -in its Chapter II- stipulates on duties of the Supervision Agents as follows:

- To act with respect, politeness and courteousness for every resident;
- To perform with maximum dedication, intensity and efficiency the functions for which they have been appointed;
- To conduct an educational role at every opportunity to do so, disseminating the provisions of municipal legislation on cleaning the city;
- To refrain from any non-ethical action, or corrupt or similar behavior actions;
- To refrain from any abusive, arbitrary or discriminatory practice that brings with physical or mental violence;
- To be properly identified and uniformed in the performance of their duties; and
- To save strict confidentiality on all matters that have acquired in the course of or in connection with the performance of its functions even after the function term.

Furthermore, according to MMR No. 87/AM/2008, the Supervision Agents have -explicitly- an educational role for disseminating the provisions of municipal legislation on cleaning the city. In that sense the Supervision Agents are one of the principal stakeholders considered in the process of formulating the Strategic Plan.

Whereas, MMR No. 89/AM/2008, Regulation on the Components of Cleaning of Maputo Municipality, stipulates in its Chapter II on the cleaning operation components of solid waste management such as street sweeping, waste disposal and collection with sanction norms for infringements, and in its Chapter VIII stipulates on matter related to final disposal of the waste.

1-4) Identification of Stakeholders and defining collaboration mechanism schemes

Based on MMR No. 50-AM-2010, the Municipality of Maputo is administratively divided by seven district jurisdictions: KaMpumfu, Nhlamankulu, KaMaxakeni, KaMavota, KaMubukwana, KaTembe, and KaNyaka. The Regulation also stipulates as follows the inherent functions of the Districts:

- To participate in the preparation and implementation of the Strategic Plan of the Maputo Municipal Council;
- To propose the Plan of Operation and Budget of Municipal District, overlooking the gradual implementation of the decentralization process, including the redefinition of services and structures;
- To participate in the identification and implementation of actions and projects of the Municipal Directorates initiatives in the Municipal District;
- To manage and implement the provision of decentralized services at District tier;
- To ensure the effective participation of communities in the governance of Municipal Districts;
- To ensure the effective management of human, financial and material resources of Municipal Districts;
- To ensure the implementation, management and maintenance of municipal infrastructure in the District; and
- To ensure compliance with policies, standards, technical and administrative procedures in the Municipal Council.

Moreover, the Municipal Districts are administratively divided in Neighborhoods (Bairros). The Neighborhood jurisdictions in the Municipality of Maputo are listed in below.

Table 2.71 Municipal Districts and Neighborhoods of Maputo Municipality

Municipal District	Neighborhoods (Bairros)
KaMpumfu	Alto Maé A, Alto Maé B, Central A, Central B, Central C, Coop, Malhagalene A, Malhagalene B, Polana-Cimento A, Polana-Cimento B, Sommerschild, and CFM
Nhlamankulu	Aeroporto A, Aeroporto B, Chamanculo A, Chamanculo B, Chamanculo C, Chamanculo D, Malanga, Minkadjuine, Munhuana, Unidade 7, and Xipamanine
KaMaxakeni	Mafalala, Maxaquene A, Maxaquene B, Maxaquene C, Maxaquene D, Polana-Caniço A, Polana Caniço B, and Urbanização
KaMavota	3 de Fevereiro, Albazine, Costa do Sol, F.P.L.M., Ferroviário, Hulene A, Hulene B, Laulane, Mahotas, Mavalane A and Mavalane B
KaMubukwana	25 de Junho A, 25 de Junho B, Bagamoyo, George Dimitrov, Inhagóia A, Inhagóia B, Jardim, Luis Cabral, Magoanine A, Magoanine B, Magoanine C, Malhazine, Nsalene, and Zimpeto
KaTembe	Inguite, Incassane, Guachene, Chali, and Chamissava
KaNyaka	Ribzwene, Inguane, and Nhaguene

Source: JICA expert team

In addition, according to MMR No. 50-AM-2010, the inherent powers of the Secretary of Neighborhoods are as follows:

- To direct and control the activities of the Neighborhood;
- To provide and promote the construction and maintenance of infrastructure in the Neighborhood;
- To call and manage over meetings with the community of the Neighborhood and meet regularly with the residents;
- To create working committees whenever necessary for the proper performance of activities in the Neighborhood;

- To publish laws, resolutions, municipal ordinances and other information about the Municipality;
- To ensure the compliance with the Municipal Regulations in coordination with the Municipal Police;
- To ensure the sanitation of the District organizing cleaning campaigns, sanitation and civic education appropriately to preserve the environment and to prevent against diseases;
- To monitor and coordinate the logging, hunting, fishing, farming activities in protection zones and uncontrolled fires in the Neighborhood; and
- To ensure good relations and coordination between the local administrative authorities and the traditional authorities and other existing social organizations in the Neighborhood.

Similarly, the Neighborhoods are administratively divided by Quarters (Quarteirões), in which their Chiefs have inherent powers as listed in below.

- To promote the work within the Quarter;
- To hold meetings with the residents of the Quarter in order to discuss and search for solutions to problems therein;
- To receive contributions and suggestions from residents of the Quarter and presents them to the respective Neighborhood or to the Municipality;
- To disseminate and ensure the implementation of its decisions of Neighborhood or Municipality to residents of the Quarter;
- To mobilize residents for the proper conservation and use of infrastructure and to preserve the sanitation in the Quarter;
- To participate in Neighborhood collective meetings whenever called; and
- To ensure a good relationship and behavior with traditional chiefs.

As aforementioned, the jurisdictional organization of Maputo Municipality in seven Districts, this in Neighborhoods, and the latter in Quarters as those as the hierarchical relationship among them was taking into account. At the same time, the powers delegated to the Secretaries of Neighborhoods and Chiefs of Quarters were also referred for the structuring of collaboration mechanism required for the implementation of the Strategic Plan of Civic Education.

According to MMR No. 50-AM-2010, which regulates on the organizational statute of the technical and administrative services and the personnel number of Maputo Municipality, DMSC has the following functions:

- To propose and implement policies and strategies on cleaning services of the Municipality;
- To ensure the collection and transportation of solid waste generated by the residents;
- To ensure the final disposal of solid waste in environmentally acceptable conditions;
- To promote reduction, reuse and recycling activities of solid waste;
- To encourage the participation of residents, community organizations and the private sector in the management of solid waste;
- To monitor the quality standards of provision of internal or external services (providers) as well as compliance upon inherent legislation by the residents;
- To coordinate and control the streets sweeping taking into account the protection of drainage systems and overall cleaning of the city;
- To provide strategic planning and monitor the inherent operations;
- To ensure the acquisition, maintenance and repair of the waste collection facilities and equipments;

- To manage the provision of service contracts;
- To ensure the implementation of a strategy for economic and financial sustainability of solid waste management;
- To ensure the service to all non-domiciliary waste generators;
- To promote the integration of the informal sector in the integrated (inclusive) management of solid waste;
- To ensure the maintenance and repair of waste collection vehicles;
- To draw up Plan of Activities and Budget of DMSC and ensure their implementation, monitoring and evaluation;
- To ensure the implementation, monitoring and evaluation of the Human Resources Management Policy of the Municipal Council; and
- To ensure the compliance with policies, standards, technical and administrative procedures of the Municipal Council.

Among the above listed tasks of DMSC, the one referred to as “to encourage the participation of residents, community organizations and the private sector in the management of solid waste” is directly related with the duties of GECPA. In this scenario, GECPA was engaged on the formulation of the Strategic Plan of Civic Education in regard of solid waste management and 3R concepts introduction of Maputo Municipality.

1-5) Identification of critical issues and definition of prioritizing criteria

The Strategic Plan serves principally for drawing up the Plan of Activities for GECPA. In that sense, an identification of critical issues involved in the solid waste management as those as introduction of 3R concepts were considered. Simultaneously, were defined the criteria for prioritizing those critical issues, in order to facilitate the formulation of the Plan of Activities of GECPA.

By the way, GECPA had identified critical issues in regard of solid waste management and also for the introductory process of 3R concepts. In addition, the good practices and learned lessons from conducting the pilot projects in the Neighborhoods of Chamanculo D, Costa do Sol, Mahotas and Zimpeto were referred in this process of definition of priorities.

Having identified the critical issues and defined the criteria of prioritizing the issues, the Strategic Plan will be able to provide relevant information for the preparation of Plan of Activities for GECPA, classifying in detail time-span targets by sectorial subjects supported by the respective Stakeholders.

2) Monitoring system for civic education activities

The Staff of GECPA understood on the necessity to having a monitoring system for measuring -objectively- the performance of their activities, during the formulation process of the Strategic Plan.

The Strategic Plan of Civic Education ordered by type of identified problems, the respective possible solutions, the division of DMSC which should engage the correcting activities, the stakeholders that should participate or collaborate on countermeasure activities; as those as pre-conditions necessary to implement the correcting activities. The following Table 2.72 lists the details of the analysis result.

Table 2.72 Result of analysis on problem and possible solutions

Problem	Problem entity	Possible solutions	DMSC division in charge of countermeasure activities	Stakeholders	Pre-conditions for implementation	DMSC division in charge of pre-conditions
Lack of knowledge on 3R concepts	Educational institutions Civilians	Introduction of 3R concepts at educational institutions Public awareness rising campaigns in critical locations	GECPA	Education and Culture Councilor Office Ministry of Land, Environment and Rural Development Health and Social Action Councilor Office Representatives of waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief Directorate of Markets	Availability of educational materials on 3R concepts Information of market demand for recoverable resources Availability of technology for reuse/recycle of recoverable resources Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	GECPA RMCQ Section of Supervision Department of Urban Solid Waste Management
Waste throw in inappropriate locations by pedestrian and car drivers	Unaware civilians	Public awareness rising campaigns in critical locations	GECPA	Municipal Police Transportation and Transit Councilor Office Supervision Agent Neighborhoods Secretary Quarters Chief Civil Society	Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	RMCQ Section of Supervision GECPA Department of Urban Solid Waste Management

Problem	Problem entity	Possible solutions	DMSC division in charge of countermeasure activities	Stakeholders	Pre-conditions for implementation	DMSC division in charge of pre-conditions
Lack of information system among reusable/recyclable waste users and producers	DMSC	Implementation of 3R promotion activities	DMSC	Recycling companies Representatives of waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief	Availability of plan for 3R promotion activities Identification of market demand for recoverable resources Availability of technology for reuse/recycle of recoverable resources Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	RMCQ GECPA
Lack of effectiveness for collecting recyclable materials	DMSC	Implementation of 3R promotion activities	GECPA Department of Urban Solid Waste Management RMCQ	Recycling companies Representatives of waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief	Availability of plan for 3R promotion activities Market demand for recoverable resources Availability of technology for reuse/recycle of recoverable resources Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	Department of Urban Solid Waste Management RMCQ GECPA Section of Supervision
Lack of knowledge for waste selection	Civilians Waste collection service provider	Public awareness rising campaigns in critical locations Supervision for changing attitude of waste collection service provider Promotion of recycling business	GECPA Section of Service Proofing Department of Urban Solid Waste Management	Representatives of Waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief Directorate of Markets	Market demand for recoverable resources Availability of technology for reuse/recycle of recoverable resources Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	Department of Urban Solid Waste Management RMCQ Section of Supervision Section of Service Proofing GECPA

Problem	Problem entity	Possible solutions	DMSC division in charge of countermeasure activities	Stakeholders	Pre-conditions for implementation	DMSC division in charge of pre-conditions
Scattering of waste from containers by the waste-pickers	Unaware waste-pickers Unaware residents disposing the conglomerated waste	Public awareness rising campaigns in critical locations	GECPA	Representatives of waste-pickers Microenterprise Supervision Agent Neighborhoods Secretary Quarters Chief	Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	RMCQ Section of Supervision Department of Urban Solid Waste Management GECPA
Insufficient places for storing and capacity for collecting recyclable materials	DMSC	Implementation of 3R promotion activities	DMSC	Recycling companies Representatives of Waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief	Availability of plan for 3R promotion activities Market demand for recoverable resources Availability of technology for reuse/recycle of recoverable resources Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities	Department of Urban Solid Waste Management RMCQ GECPA Section of Supervision
Proliferation of illegal waste dumps	Civilians Large generators of waste Waste collection service provider/microenterprise	Public awareness rising campaigns in critical locations Enforcement on large generators of waste Enforcement on waste collection service provider	GECPA Section of Supervision Section of Service Proofing Department of Urban Solid Waste Management	Supervision Agent Neighborhoods Secretary Quarters Chief Ministry of Land, Environment and Rural Development Civil society	Sufficient availability of waste containers Identification of critical locations Establishment of monitoring system for the measurement of awareness rising activities Strengthening of monitoring duties of EIA regime of the Ministry of Land, Environment and Rural Development	Department of Urban Solid Waste Management Section of Service Proofing RMCQ Section of Supervision DMSC Ministry of Land, Environment and Rural Development

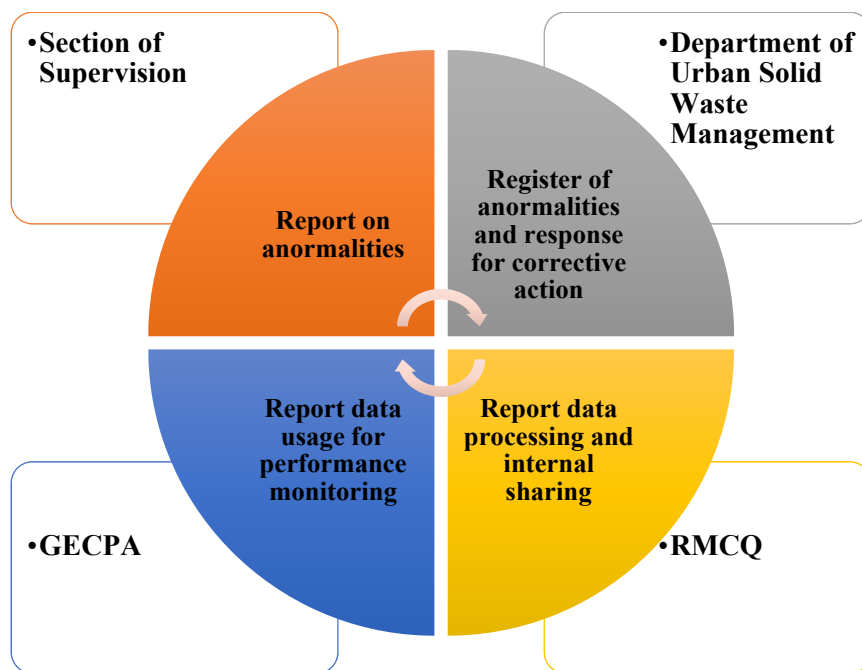
Problem	Problem entity	Possible solutions	DMSC division in charge of countermeasure activities	Stakeholders	Pre-conditions for implementation	DMSC division in charge of pre-conditions
Firing of waste containers	Civilians	Public awareness rising campaigns in critical locations	GECPA	Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief Directorate of Markets	Identification of critical locations Establishment of monitoring system for the identification of critical locations	RMCQ Section of Supervision GECPA Department of Urban Solid Waste Management
Proliferation of informal waste-pickers	Informal waste - pickers	Formalization of waste-pickers throughout conformation of cooperative organizations Insertion of waste-pickers into a formal recycling business Awareness rising of waste-pickers at informal storage points	RMCQ Section of Service Proofing Section of Supervision	Ministry of Labor, Employment and Social Safety Ministry of Health Representatives of Waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief	Provision of legal framework for the formalization of waste-pickers on labor and health concerned procedures Advantage for the informal waste-pickers to formalize Consent by the informal waste-pickers Identification of informal storage points	GECPA Councilor Office of Health and Social Action and Legal Office Section of Supervision
Waste burning at waste dumping sites	Waste-pickers in dumping sites Civilians	Separation of recyclable metals in source Metals collection system from the source Education campaign for waste-pickers	RMCQ GECPA Section of Supervision	Representatives of waste-pickers Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief Civil Society	Introduction of recyclable materials collection system Establishment of recyclable materials segregation facility in waste disposal sites	Department of Urban Solid Waste Management RMCQ

Problem	Problem entity	Possible solutions	DMSC division in charge of countermeasure activities	Stakeholders	Pre-conditions for implementation	DMSC division in charge of pre-conditions
Lack of compliance for waste collection schedule	Waste collection service provider/ microenterprise	Enforcement on waste collection service provider	RMCQ Section of Supervision	Supervision Agent Neighborhoods Secretary Quarters Chief Association of small- and micro-scale enterprises Civilians	Identification of critical locations Establishment of monitoring system for the measurement of supervision activities	RMCQ Section of Supervision Department of Urban Solid Waste Management
Waste burning	Civilians	Public awareness rising campaigns in critical locations Implementation of effective system of supervision	GECPA Section of Supervision	Waste collection service provider Supervision Agent Neighborhoods Secretary Quarters Chief	Identification of critical locations Establishment of monitoring system for the identification of critical locations Establishment of effective supervision system	RMCQ Section of Supervision GECPA Department of Urban Solid Waste Management
Seasonal increase of waste by special events	Civilians Event Promoters	Revision of Regulation of USWM on post-event cleaning assurance concerning stipulations	DMSC	Municipal Council CMM Legal Office DMSC Event Promoters	Promulgation of the revised USWM Regulation	Municipal Council CMM Legal Office DMSC

Source: DMSC. Strategic Plan of Civic Education.

As listed in the Table, almost all the countermeasure activities has as pre-condition the establishment of monitoring system for the measurement of awareness rising activities or for the identification of critical locations. Taking into account the scenario, GECPA decided to ask for to establish a collaboration mechanism among the divisions of DMSC defining respective roles.

In fact, the following Figure 2.41 shows the collaboration mechanism suggested to implement among the related divisions of DMSC.



Source: JICA expert team

Figure 2.41 Structure of collaboration mechanism for monitoring GECPA's activities

In consequent with the request, the officials of Section of Supervision agreed onto collaborate providing in-situ data gathered by the Supervisors to the Department of Urban Solid Waste Management and Section of Quality Control and Monitoring; and also, to adjust reporting forms for eventual changes in this process of defining priorities and performance improvements in regard of awareness campaign monitoring system.

Following the abovementioned approach, a monitoring system consisted on a collaboration mechanism amongst divisions of DMSC was agreed to conform as follows:

- Daily reports from the Section of Supervision will be provided to the Department of Management of Urban Solid Waste based on the recording format used in the Pilot Project for improvement of waste collection and transportation. The format contains information on irregular situations at collection points identified by field supervision using defined ID for the geographic location by collection routes and collection points, and defined code by kind of constrains (e.g. burning of container, waste thrown outside of container, container overloaded);
- The Department of Management of Urban Solid Waste will record the daily reports gathered from the Section of Supervision comparing with those data reported by Ecolife (waste collection service provider) in an Excel format file. This Excel format consists on a list of all collection points identified by collection route and collection point with geo-referenced data. Weekly records of these Excel formats will be shared with the Section of Quality Control and Monitoring;
- The Section of Quality Control and Monitoring will produce Maputo city overlapped locations of the recorded constrains using a free geodetic program shareware QGIS. These outputs will be weekly shared with the Department of Management of Urban Solid Waste, and GECPA;

In regard of this information, GECPA will use them for identification of critical locations by type of constrain and hence for planning educational and awareness rising campaigns. And also for monitoring their performance of those campaigns observing the situations before and after the approaches.

3) Establishment of a systematic planning of GECPA activities

Having formulated the Strategic Plan of GECPA, was agreed with the Staff of GECPA the following approach in order to establish a systematic planning of their activities:

- Formulation of Guidelines of GECPA adopting the context of the Strategic Plan;
- Formulation of the Master Plan correspondent to GECPA activities taking into account the implementation of the Programs constituting the Strategic Plan;
- Formulation of Action Plan considering the priorities identified during the formulation of the Strategic Plan; and
- Implementation or monitoring system of GECPA activities strengthening the collaboration mechanism established among the related division of DMSC.

The achievement of systematic planning of GECPA activities is described in the following Section 2.4.4 "Implement improved programs for 3R introduction (Activity 4-4) 3) Systematic planning of GECPA activities".

2.4.4 Implement improved programs for 3R introduction (Activity 4-4)

1) Outline of Civic Education Strategy and Programs

The Strategic Plan of Civic Education, with regard on solid waste management and 3R concepts introduction, formulated in the 2nd Year by GECPA, was approved by DMSC on ending December 2015. Its implementation started on November 2016.

1-1) Process of revision and approval

The first draft document of Strategic Plan -formulated in the Second Year of the Project- was revised for its completion at GECPA, in order to use as a discussion document with other relevant divisions of DMSC, especially with those needed for strength collaboration relationships.

An agenda for discussion meetings was appointed with the Sections of Quality Control and Monitoring, Supervision, and Proof of Service pertaining to the Department of Planning and Monitoring, and the Section of Public Collection under the Department of Solid Waste Management. The first agenda of revision works was conducted between July 15th and 22nd, 2015.

Standing outcomes from the discussion meetings were:

- The Section of Quality Control and Monitoring suggested that activities related to promotion of 3R should be engaged jointly among their section and GECPA;
- The Section of Supervision suggested to be added a new activity to deal with the problem generated by big events in open areas; meanwhile, they offered to participate in more activities in coordination with the Section of Quality Control and Monitoring, in order to establish effective monitoring mechanisms;
- The Section of Proof of Service appointed that the foremost constrain of them is the problem caused by the irresponsible event promoters unaware of post-event waste handling, and the importance to have as collaborator the Directorate of Markets of CMM in order to improve waste management in markets; and
- The Department of Management of Urban Solid Waste offered to participate on activities related to reconnaissance of critical points.

The Officers of GECPA recorded and compiled the aforementioned discussions and had revised the first draft of the Strategic Plan. The resulted second version of Strategic Plan was compiled and submitted to the Director asking for his opinion.

As for the Directorate, Internal Meeting scheduled by August 3rd, 2015, the agenda included presentation of the Strategic Plan contents, in where unanimous approval was gathered, conditioned onto correct some miss-naming of involved entities in the proposed inherent activities.

Some minor revision on the second version was reflected by GECPA taking into account comments received during the above internal meeting, resulting on the finally approved document (at ending December 2015).

1-2) Implementation of Strategic Plan

The officially approved Strategic Plan will serve as a basis for annual and mid-term action plans for GECPA. Additionally, the officially approved Strategic Plan will be disseminated at District and Bairro-tiers, in order to gather understandings on 3R-concept approaches by the civilians of Maputo City.

The Officials of GECPA initiate the implementation of the Programs therein on November 2016 formulating their first Annual Operation Plan based on the Strategic Plan.

1-3) Context of Strategic Plan

The four programs encompassing the Strategic Plan are as listed in below:

- Introduction of 3R concepts at educational institutions: at basic schools;
- Public awareness campaigns in critical locations: dealing with the introduction of 3R concepts to civilians, prevention of waste throw in inappropriate locations to unaware civilians, fostering of waste sorting by civilians, prevention of scattering of waste from containers by unaware waste-pickers, prevention of proliferation of illegal waste dumps, firing of waste containers, waste burning;
- Implementation of 3R promotion activities: information system among reusable/recyclable waste users and producers by DMSC, storing and collecting recyclable materials;
- Education campaign to all residents: dealing with waste burning at waste dumping sites by waste-pickers working in dumping sites; and understanding of health- and environmental issues regarding improper management of wastes.

The aforementioned programs were structured considering the necessary pre-condition activities for the conduction of the respective priority activity encompassing the Program; and stakeholder entities engaging for those pre-condition activities likewise for the priority activities.

According to the analysis conducted for the formulation of the Strategic Plan, the common issue for all of pre-condition activities consists on to identify critical locations of the concerned constrain, either the approach dependent targets. While, the analysis also recognized the necessity to establish a monitoring system for to measure the performance of the educational- or awareness-rising activities to be conducted by GECPA, in order to implement PDCA cycle management upon their activities.

Under the scenario, a collaboration mechanism amongst the relevant divisions of DMSC were established, principally with the RMCQ, Section of Supervision, and the Department of Urban Solid Waste Management. Establishment of systems for the identification of critical locations and running the referred monitoring system, in regard of pre-condition activities, are matter of the collaboration mechanism with them.

In regard of the priority activities themselves, approaches consisted on participation of multiple stakeholders will be conducted. Among the stakeholders, a group of DMSC internal officers, constituted by the Supervision Agents, have significant roles on these approaches. Rely on this situation the participation of skilled Supervision Agents is an important factor for the success of the concerned activities.

Brief descriptions and standing issues of each program are as follows:

1-4) Introduction of 3R concepts at educational institutions

This Program is consisted by a solely activity targeting basic schools, and GECPA is performing educational activities at schools using didactic materials prepared as outcomes of the Project, such as “3R Manual for Professors” and “Eco-game”. The latter “Eco-game”, a Monopoly-alike board game, containing eco-friendly messages for students aiming their understanding on 3R concepts.

These educational materials were prepared during the Project activities of the Second Year of the Project by GECPA with technical support from JET.

Further to the first version, a new version of “Eco-game” was made by the Officers of GECPA, correcting some miss-printings on the first version, and adding numbers of the game routes to be clear for the children to play the educational game. With their own budget, the GECPA ordered re-printings of the revised “Eco-game” aiming to use them in further activities.

As result of activities of year 2015, in total 32 schools was targeted for 3R concepts introduction. Likewise, more than 60 teachers of primary and secondary schools were trained on 3R concept. These activities continued also for year 2016, and were encompassed on full range of revised Master Plan and Action Plan.

Additionally, GECPA is completing a “3R Textbook for Students” in response of the request from the professors participating in the educational activities of GECPA. In this effort, the JOCV members are collaborating on conceptual inputs and illustration works.

Aforementioned first draft of 3R Textbook for Students was made taking into account the contents of educational videos made by past JICA projects in Costa Rica and Mexico, and on the current text recommended by the Ministry of Environment of Japan. Additionally, inputs from GECPA were considered adapting Mozambican habits and practices.

Following Figure 2.42 shows the aforementioned outcomes, 3R Manual for Professors (left side) and Eco-game (right side).



Source: JICA expert team

Figure 2.42 Educational materials for 3R concept introduction

As a complementary output of this Program, the Staff of GECPA prepared a draft of 3R Text for Students with inputs from the JOCVs. The annual plan of activities for the year 2017 contains edition of this document to be used in future activities of this Program.

1-5) Public awareness campaigns in critical locations

This Program is consisted by a group of seven activities as listed in below.

- Introduction of 3R concepts to civilians;
- Fostering the waste sorting by civilians;

- Prevention of waste throw in inappropriate locations by unaware civilians;
- Prevention of scattering of waste from containers by unaware waste-pickers;
- Prevention of proliferation of illegal waste dumps by civilians;
- Prevention of firing of waste containers by civilians; and
- Prevention of waste burning by civilians.

The Staff of GECPA found that the context of the Pilot Project for improvement of waste collection and transportation matches directly with the second Program activities proposed in the Strategic Plan. Namely, “Prevention of scattering of waste from containers by unaware waste-pickers”, and “Prevention of firing of waste containers by civilians”. Based on the scenario, the Staff of GECPA proposed to implement as was agreed with the respective divisions of DMSC, methods for identifying critical locations and the implementation of monitoring systems for the measurement of the effectiveness of their awareness rising activities.

Following the commitment, the Staff of Section of Supervision is continuously providing the information of anomalous situations in the collection route and infringements on waste treatment rules.

1-6) Implementation of 3R promotion activities

This Program is consisted by the following two activities.

- Facilitation on establishing an information system among reusable/recyclable waste users and producers; and
- Facilitation on storing and collecting recyclable materials.

The implementation of the activities of this Program depends on the market demand for recoverable resources, and on the availability of technology for reuse and recycling of recoverable resources.

On this regard, GECPA is analyzing an approach starting with CMM administrated markets. Coordination with the City Council Office of Markets is conducted in order to determine targets and stakeholders to involve. The plan for 3R approach targeting the wholesale and detail-sale markets of Zimpeto, will be retaken taking into account the behavior in the zone. In this regard, the GECPA will remake the plan adjusting on the result of coordination with the Department of Finance aiming screening priority activities from year 2017.

As an attempt of this Program GECPA specified and procured the goods to be used for civic educational campaigns to promote Zimpeto’s Pilot Project named 3R Station. Signboards for orientation of the location of “3R Station”, activity promotion-shirts and hats for the Pilot Project organizers and for distribution to the civilians during the campaigns were ordered. Also, two types of pamphlets -one for description of Zimpeto Pilot Project and another with brief concepts of 3R- were elaborated in a collaborative relationship between RMCQ and GECPA.

1-7) Education campaign to all residents

This Program is consisted by the following two activities.

- Education for understanding of health- and environmental issues regarding improper management of wastes; and
- Prevention of waste burning at waste dumping sites by waste-pickers working in dumping sites and civilians.

It is necessary to account that the first activity of this Program “Education for understanding of health- and environmental issues regarding improper management of wastes”, is not explicitly written in the Strategic Plan, but deeply discussed on its requirement during the formulation of this document.

A music album editing with 12 themes useful for civic education campaigns with songs in Portuguese and Changana-languages basically in a local rhythm “Marabenta” and “Arenbi Soul”. For the attempt, GECPA provided to the musician group a 3R Manual for the Professors and a Master Plan in digital formats as references for making the song lyrics.



Source: JICA expert team

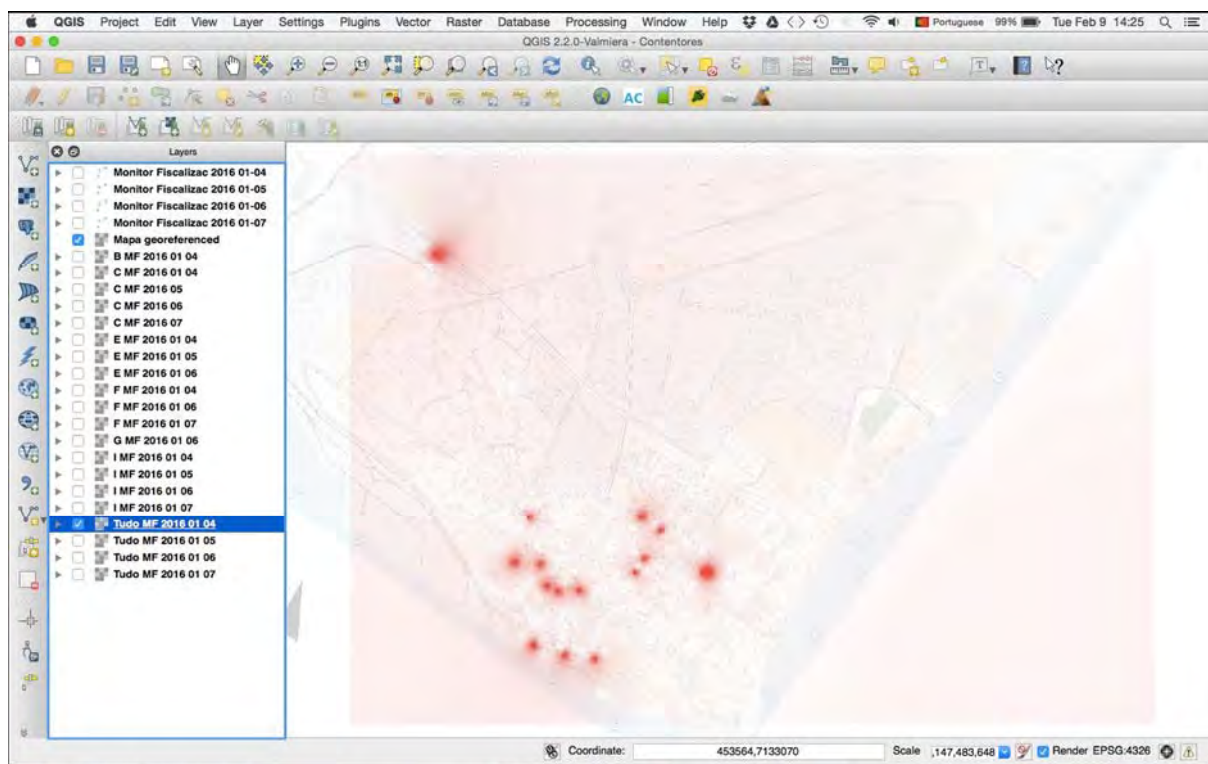
Figure 2.43 Music Album for Educational Campaigns

2) Implementation of Monitoring System for Civic Education Activities

A monitoring system -considering PDCA cycle concept- agreed among the relevant divisions of DMSC will use mapping of critical locations in a flexible way, been capable to show for a period of time desired to evaluate the situation, and also to show sorted specific constrain. In that sense: the planning of awareness rising activities of GECPA can be formulated by geographical basis either by a problem-specific basis. After the conduction of awareness rising activities, a posterior figure of the critical location can be compared with the previous situation in order to evaluate the effectiveness of the approach. A revision stage can be a reference for further improvement for future approaches considering learnt lessons.

A sample of monitoring map to be constructed and shared by the Section of Quality Control and Monitoring is shown in Figure 2.44. The map shows overall constrains detected on field supervision of January 4th, 2016. In this specific case, detected constrains were: burning of waste container, waste scattered outer of container, illegal disposal of non-household waste, and disposal of construction debris. The red colored balloons are the locations of detected constrains, and the size of the balloon is proportional to the number of constrains in the location. Thus, as bigger the balloon, multiple constrains coexist in a single location.

The free program shareware QGIS was installed in all available computers of the divisions participating in the collaboration mechanism, and a Manual for using QGIS was also provided and revised by the Section of Supervision to all participants of the mechanism.



Source: JICA expert team

Figure 2.44 A sample of monitoring map showing overall constrains detected on field supervision

3) Systematic planning of GECPA activities

The actual achievement of systematic planning of GECPA consist on the following:

- Guidelines of GECPA adopting the context of the Strategic Plan: The formulation of Guidelines for Civic Education was finalized adopting the former Strategic Plan in a form to be a guidance document for drafting the respective Master Plan;
- Master Plan correspondent to GECPA activities taking into account the implementation of the Programs constituting the Strategic Plan: The revision of Section 4.7 of the Master Plan was realized in order to be in line with the drafted Guidelines. Section 6.6 was added with the 10-year activity plan; and Sections 7.2 and 7.3 were completed with respect of monitoring issues;
- Action Plan considering the priorities identified during the formulation of the Strategic Plan: The Action Plan for Civic Education system was drafted with the first 5-year plan of Master Plan focusing on the enhancement of monitoring system in collaboration -especially- with the Division of Supervision; and
- Implementation or monitoring system of GECPA activities strengthening the collaboration mechanism established among the related division of DMSC. A draft manual for the use of geodetic tools, in regard of the monitoring system of awareness campaigns, was develop in order to use it for training users of QGIS software.

Moreover, as a collateral effect, the Staff of Division of Supervision initiate drafting of their Guidelines by their own, taking into account similarity and dissimilarities of duties with of GECPA. Currently, they completed a draft document analyzing problems, relevant stakeholders, and possible solutions of daily constrains. It is expected a Master Plan-like document be drafted by own effort in near future.




2.4.5 Develop a plan for a Pilot Project for promotion of recycling activities (cooperation with private sector) based on the results of Activity 4-2 (Activity 4-5)

1) Target area

As it was observed the NGO named AMOR is operating valuable recovery activities (Eco-point) mainly in cement city, it was agreed among the concerned parties that valuable recovery activity initiated by DMSC should be implemented in the suburban area. So, the objective of this activity was confirmed to be “to promote valuable recovery activity in the suburb where no major recyclables recovery activity is observed but there is a potential to enhance recyclables recovery activities by the support from DMSC.”

The 3 candidate sites for setting-up valuable storage facility (named as “3R station” in the P/P) as shown in Table 2.73 was identified as available governmental lands, and candidate site 2 was selected as appropriate space for establishing the facility after examination as shown in Table 2.73.

Table 2.73 Candidate Sites for 3R Station

No.	Candidate Site 1	Candidate Site 2	Candidate Site 3
Bairro	Zimpeto	Zimpeto	Mahotas
Population (2017)	21,755	21,755	31,863
Location	14km North from DMSC office (Travel Distance)	17km North from DMSC office (Travel Distance)	14km North-Northeast from DMSC office (Travel Distance)
Coordinate	25°51'43.13"S 32°34'19.08"E	25°50'9.91"S 32°34'47.13"E	25°52'53.40"S 32°37'6.37"E
Ownership	CMM An approval letter for the use of public land is necessary	CMM An approval letter for the use of public land is necessary	Bairro An approval letter for the use of public land is necessary
Configuration	Vacant/Flat	Vacant/Flat	Vacant/Flat
Area(m ²)	About 750m ² (25m × 30m)	About 1,750m ² (50m × 35m)	About 200m ² (25m × 8m)
Land Leveling	Necessary	Necessary (Cutting of trees may be required)	Necessary (Cutting of trees may be required)
Surrounding	Residential area Next to Green Area	Residential area Near National Stadium Near Bairro Secretary office Former local market	Residential area Near Bairro Secretary office
Population Density	Low Possibility of Recyclable is Relatively Less	Middle Possibility of Recyclable is Relatively High	High Possibility of Recyclable is High
Access	Unpaved road (600m from Paved Road of N1)	Unpaved road (500m from Paved Road of near the stadium)	Unpaved road (250m from Paved Road of Avenida Cardeal Alexandre dos Santos)
	Not so easy to access during rainy season	Not so easy to access during rainy season	Relatively easy to access during rainy season
Photo			

Source: JICA expert team

Table 2.74 Evaluation of the Candidate Sites for 3R Station

Candidate	Present Situations	Issues	Evaluation
Site 1	Pavement construction of an access road to the site is required.	A budget for pavement from CMM is rather difficult to be acquired. Construction time is required for a longer period.	×
Site 2	The site is located in the former market area	The site is located in the residential area. The site is set-back from the nearest road.	○
Site 3	Recyclable collections are already implemented by informal sector.	There is high possibility of conflict with the informal sector.	×

○ Good for selection with some considerations, × Not good for selection

Source: JICA expert team

2) Target recyclable item and purchasing price

Through the discussions with C/P and other relevant stakeholders, considering that it was the first challenge for DMSC to operate valuables recovery facility (3R station), it was confirmed to be appropriate to follow the target items and their purchasing prices realized by AMOR which has much experiences to operate valuables recovery activity. Hence, the target items and purchasing price for 3R station was determined as shown in Table 2.75.

Table 2.75 Target Recyclables and Purchase Prices

Category	Recyclable	Code	Price Mt/ Kg
Paper	Paperboard	K3	0.25
	White paper	SMW	0.50
	Shredded paper	HR1	0.50
Metal	Aluminum can	ALM	7.0- 8.0
	Food can	FC	0.5
	Iron can	UBC	0.75
Plastic	Low Density Plastic	LDP	1.5
	High Density Plastic	HDP	1.5
	PET bottle	PET	1.5
Glass	Beer bottles	2M	50 (100 bottles – 55 kg)

Source: JICA expert team

3) Implementation structure

In the P/P implemented under the Project, it was decided to obtain support from private and non-governmental organizations with the reasons as shown in Table 2.76. Then, the implementation structure of 3R station P/P was examined and agreed among stakeholders as summarized in Table 2.77.

Table 2.76 Private Sector Involvement in 3R Station

Private Entity	Category	Necessity of Collaboration	Role for 3RStation
Associação Moçambicana de Reciclagem (AMOR)	Local NGO	AMOR has know-how of managing their Eco-points in the Cement City which can be applied to 3R Station in Zimpeto bairro (Suburb).	As a technical advisor for operation of 3R Station.
Oliveira Multi-Services LDA	Micro Enterprise (ME)	The ME is in charge of primary collection service for household waste in Zimpeto and can communicate with local residents.	As a service operator for 3R station and also in charge of implementing public relation activity.

Source: JICA expert team

Table 2.77 Implementation Structure of 3R Station

No.	Item	Description
1.	Project Owner	DMSC/CMM
2.	Investment	DMSC/CMM in cooperation with JET
3.	Operator	ME (under agreements among DMSC, ME and JET)
4.	Advisor	AMOR and JET
5.	Communication with customer and residents	ME (act for DMSC/CMM)
6.	Proprietary rights of facility and land	DMSC/CMM
7.	Submission of periodical reports (weekly and monthly)	ME under the supervision of DMSC/CMM and JET
11.	Setting purchasing price (tariff) of valuables	DMSC with support from JET and AMOR
12.	Selling price of valuables	Marketing effort by ME under the supervision of DMSC/CMM and with support from JET and AMOR
14.	Service Charge for the Operation	100% of the profit by trading valuables is paid to ME

JET: JICA expert team, ME: Micro Enterprise, AMOR: a local NGO

Source: JICA expert team

4) Arrangement of valuables recovery facility and other equipment/materials

For the facility, building type and shipping container type were examined and shipping container type was selected in the P/P, mainly because of necessary time for setting-up the facility. The scenery of installation work and established valuables recovery facility (3R station) is shown in Figure 2.45.

The installed container type storage facility equipped lock so that recyclables can be safely stored in the facility. The logo of 3R station was examined by the concerned stakeholders and designed as shown in Figure 2.46. It also equipped working area to receive recyclables and toilet for the staff and customers as shown in Figure 2.47.



Facility Installation Work

Source: JICA expert team



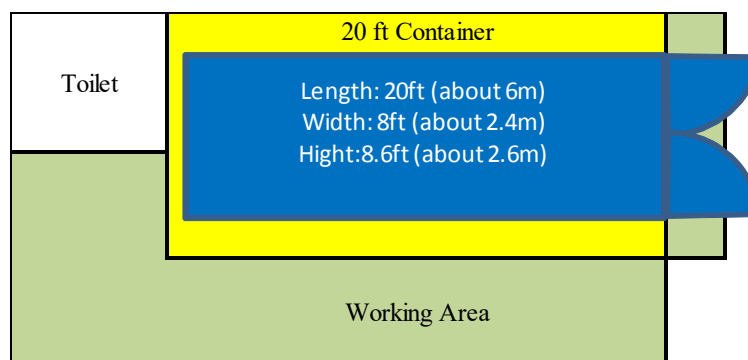
Installed Valuables Recovery Facility (3R Station)

Figure 2.45 Scenery of Installation of 3R Station



Source: DMSC

Figure 2.46 Logo of 3R Station



Source: JICA expert team

Figure 2.47 Layout of Installed 3R Station

Basic functions of 3R station are the purchase (collection) of separated recyclables, sorting and management of the recyclables collected and cash flows, transportation of the recyclables to recycling companies and the payment to the customers (residents). Figure 2.48. shows an illustration of the function of 3R Station.



Source: JICA expert team

Figure 2.48 Function of 3R Station

Other necessary equipment and material for valuables recovery activity were identified and responsible entities to procure was agreed as shown in Table 2.78.

Table 2.78 Necessary Equipment and Materials for 3R Station

Equipment and Materials		Responsible Entity (Cost Sharing)			Remarks
		DMSC	M/E	JET	
Facility	Container	-	-	◎	Including painting, transportation, land leveling and Setting up)
	Toilet for 3R Station	◎	-	-	Designed by DMSC
	Shade (eave) for 3R Station	◎	-	-	Designed by DMSC (by asking the container supplier about the design)
	Key for Container (2)	-	-	◎	Due to the structure of the container, 2 Keys (padlock and keys) are necessary
Furniture	Chairs (4)	◎	-	-	
	Desk (1)	◎	-	-	Scale use permission is necessary (DMSC application)
Stationery	Notebooks	◎	-	-	1 per month
	Stapler (1)	◎	-	-	
	Pens	◎	-	-	1 per 2 months
	Maker pen	◎	-	-	1 per month
Monetary Management Materials	Receipt Book	◎	-	-	1 per month
	Calculator (2)	◎	-	-	
	Cashbox (1)	-	◎	-	For safety of money, M/E shall procure the cashbox
	Stamp (1)	-	◎	-	Utilize M/E own Stamp
Operational Materials	Scale (2: 150-200kg)	◎1	-	◎1	Scale use permission is necessary (DMSC application)
	Other materials necessary for daily operation of P/P	◎	-	-	Such as plastic lines for biding recyclables, brooms and dustpans, buckets, soap, detergent and so on
	Raffia Bags	◎	-	-	To protect Cans (50-100 per month)
	PC (laptop)	-	(◎)	-	Making use of the PC of Mr. Oliveira for P/P (not use in the 3R Station for security reasons)
	First Aid Kit	◎	-	-	Simple set of Band-aid, disinfectant liquid spray and pain pills
	Fire Extinguisher	◎	-	-	
Personal Protective Equipment (PPE)*	Uniform Wear	-	◎	-	1 for each worker(to be replaced per six months)
	Gloves	-	◎	-	2 pairs of gloves per month depending on the quality
	Masks	-	◎	-	1 by week
	Shoes	-	◎	-	1 pair of Boots
Civic Education and Campaign	Signboards	◎	-	-	As part of Civic education and Campaign for P/P. In addition, 1 outside signboard showing price and materials
	Pamphlet	◎	-	-	
	T-shirts and Hat (Cap) for distribution	◎	-	-	
	T-shirts and Hat (Cap) for DMSC	◎	-	-	
Others	Water supply for the Toilet	◎ (Construction)	◎ (Operation)	-	Or utilize Water Gallon bucket 20 L(?)
	Throve* (2)	-	(◎)	-	For Primary collection (One Throve is about Mt 4,000-5,000)

◎: Entity responsible

Source: JICA expert team

5) Arrangement of operational procedures of valuables recovery activity

The operational procedures of valuables recovery activity was designed as shown in Table 2.79 and Table 2.80.

Table 2.79 Operational Manner of 3R Station

Item	Description
Operation day	Monday to Saturday
Operation Hour	Monday to Friday : AM (7:30-12:00), PM (13:00-16:00) Saturday : AM (7:30-12:00)
Non-Operation day	Sunday and National holidays
Particular Activity	Every Thursday : Cut-off day for the purchasing of the week* Every Friday : Pay day to the customer** Every Saturday : Half day operation (Morning only)

* Previous Friday to the (next)Thursday.

** Payment for the purchasing among of the week from the previous Friday to the (next) Thursday.

Source: JICA expert team

Table 2.80 Daily Operational Manner of 3R Station

Day	Mon	Tue	Wed	Thus	Fri	Sat	Sun
Operation	AM	AM	AM	AM	AM	AM	No Operation
	PM	PM	PM	PM	PM	No Operation	
Particular Activity	-	-	-	Cut-off day	Pay day	-	-

Source: JICA expert team

6) Implementation schedule

In the P/P implemented under the Project, valuables recovery (3R station) pilot project was implemented as shown in Table 2.81.

Table 2.81 Implementation Schedule of 3R Station P/P

Work Item <div>Schedule</div>	2015										2016	
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Planning of P/P												
Preparation of P/P												
Implementation of P/P												
Monitoring of P/P												

Source: JICA expert team

7) Development of operational manual

The operational manual which contains information and instructions as shown in Table 2.82. were developed by the technical support from AMOR.

Table 2.82 Table of Contents of Operational Manual for 3R Station

Chapter	Contents
Introduction	
Plan of Integrated Solid Waste Management for 3R Station	
3R Station	3.1. Structural components of 3R Station 3.2 Operation of 3R Station 3.3 Operational routine
Waste Management at 3R Station	4.1 Pre-screening and screening 4.2 Packaging
Purchase Operation at 3R Station	5.1 Buying and selling strategy
Value Chain Scheme and Stakeholders of the Process	6.1 Organizational chart 6.2 Terms of reference
Data Management and Control for Recyclable Material Flow of 3R Station	7.1 Daily log book 7.2 Weekly report 7.3 Monthly report
Responsibility Management of 3R Station	8.1 Liability of manager / microenterprise 8.2 Biosafety rules 8.3 Customer service rules

Source: JICA expert team

8) Training for operational staff

Number of meetings was held with the ME who will perform as operator of 3R station, DMSC who will perform as manager of 3R station, AMOR and JICA expert team as technical advisor to discuss design and necessary arrangements of valuables recovery activity. Also, a series of training for the workers of the ME was held as shown in Table 2.83 and Figure 2.49 to have them understood operation procedures, how to deal with residents, and so on.

Table 2.83 Training of Workers for 3R Station

Training	Description
Period	Total 2 Months (From the middle of May to the middle of July 2015)
Place	an Eco-point of AMOR operated in the Cement City of Maputo (25° 58.734'S, 32° 34.865'E)
Trainer	AMOR Staff operating the Eco-point
Trainee	Two local workers dispatched by ME
Contents	Waste recovery, Types of Recyclable Waste, Waste packaging forms, Flow Management, Financial Management (as regards the purchase and sale of recyclable waste) and Preparation of weekly reports

Source: JICA expert team



Source: JICA expert team

**Figure 2.49 Training for ME for 3R Station**

9) Dissemination to residents

By considering type of stakeholders for the 3R station, methods for campaign and involvement of local stakeholders were identified as in Table 2.84. Detail of each method is described below.

Table 2.84 Campaign and Involvement of Local Stakeholders for 3R Station

Stakeholder	Relevant Campaign and Meeting
Local Leader (Quarter Heads, Secretary of Bairro)	Explanatory Meeting with Quarter Heads
Local Citizen (User of 3R Station)	Opening Ceremony of 3R Station Door to door campaign Involvement of Local Collaborators Installment of Signboards
Local Citizen (Young generation)	Workshop at Wiriyamu Primary School (including formation of environmental club)
Visitors from outside of Bairro (User of 3R Station)	Installment of Signboards

Source: JICA expert team

9-1) Explanatory meeting with quarter heads in Zimpeto Bairro

To explain the objectives and operational detail of the 3R station, DMSC and JICA expert team had explanatory meeting with Zimpeto Bairro on 5th June, 18th July, 21st July, 15th August, 22nd August and 21st September 2015 to ensure social consideration for implementation of the P/P. Through these several explanatory meetings with Secretary of Bairro, heads of quarters and other relevant stake holders, it had been agreed that P/P will be conducted in Zimpeto Bairro.

9-2) Workshop at Wiriyamu primary school in Zimpeto Bairro

To promote concept of 3R and participation of students and neighbors in the activity of the 3R station, explanatory workshop was held at Wiriyamu Primary School located in Zimpeto Bairro on 10th September 2015 as shown in Figure 2.50. In addition, environmental club was established to actively participate environmental conservation activity with partnership with CMM. The program included the followings;

- Concept and importance of 3R with showing example of recyclable materials and reused products,
- Formation and roles of environmental club,
- Information about planned activity of the 3R station.



Meeting with Quarter Heads in Zimpeto Bairro

Source: JICA expert team



Workshop for William Primary School

Figure 2.50 Scenery of Explanatory Meeting and Workshop

9-3) Installment of signboards

To indicate the location and objectives of the 3R station, eight signboards were installed on 10th September 2015 in Zimpeto Bairro by DMSC as shown in Figure 2.51. Information on appearance of the 3R station, target recyclable items and location map were indicated in the signboards.



Source: JICA expert team

Figure 2.51 Photo of Signboard for 3R Station

9-4) Opening ceremony of 3R Station

Opening ceremony of 3R Station was held on 23th September, 2015 in front of the 3R Station in Quarter 68 in Zimpeto Bairro as shown in Figure 2.52. Director of DMSC, Representative of District KaMubukwane, Representative of Municipal Directorate of Health and Social Action, Secretary of Zimpeto Bariro, President of Oliveira ME, representative of AMOR, residents of Zimpeto Bairro, teachers and students of Wiriyamu Primary School were participated.

Purchasing of the recyclables were started after the ceremony. The program included the followings;

- Speech by Director of DMSC and Representative of Municipal Directorate of Health and Social Action and Director of Wiriyamu Primary School
- Presentation about 3R by chief advisor of JICA expert team and representative AMOR
- Explanation about operation of 3R station by president of Oliveira M/E
- Singing and cultural show for promotion of 3R concept by students of William Primary School



Source: JICA expert team



Figure 2.52 Scenery of Opening Ceremony of 3R Station

9-5) Door to door campaign to neighborhood residents in Zimpeto Bairro

To disseminate information about opening of the 3R station, door to door campaign in Zimpeto Bairro was conducted from 22th to 24th September, 2015. Staff of DMSC and collaborators had worked for distribution of leaflets.

Together with the opening ceremony, two types of 2,000 copies of leaflets (in total 4,000), 200 polo shirts and 50 caps were procured by DMSC for the campaign purpose.

9-6) Involvement of local collaborators in Zimpeto Bairro

Based on recommendation by Zimpeto Bairro, five collaborators were selected from the Quarter 68 where is the location of the 3R station to promote understanding of the local public and coordinate between citizens and operational body of the 3R station. The collaborators had worked closely with Zimpeto Bairro and its local quarters, ME as well as DMSC, mainly for launching period of the 3R Station including opening ceremony and door-to-door visit campaign. Even after completion of the launching period, collaborator had assisted monitoring. Their involvement had contributed on continuous mutual communication with the local citizen and security of materials kept in the 3R station.

10) Developing monitoring sheets

In the P/P implemented under the Project, several monitoring sheets were developed and the activity was monitored according them as below:

10-1) Daily logbook

Daily logbook is the main sources of data that are used to: a. Register recyclable materials (from customers), b. Purchase the materials, c. Sale to recycling companies and d. Stock take management. Table 2.85 shows the form of daily logbook.

Table 2.85 Daily Logbook

Logbook Data	Description	Costumer	kind of material (see table)	weight		Unit Price (Mt/kg); (see table)	Total	Signature
				IN	OUT			

Source: JICA expert team

10-2) Weekly logbook

At least 24 hours prior to “Payday” a weekly report must be prepared by the 3R Station manager to enable necessary payments to be made on time and secure. Table 2.86 shows the form of weekly logbook.

Table 2.86 Weekly Logbook

Week				
Date				
Outstanding amount				
Category	IN	OUT	STOCK	PURCHASE AMOUNT
K3				
SMW				
HR1				
ALM				
FC				
UBC				
LDP				
HDP				
PET				
2M				
Total				

Source: JICA expert team

10-3) Monthly report

Monthly reports enable to consolidate the weekly report, which should include all material flows and purchase data. Table 2.87 shows the format of monthly report.

Table 2.87 Monthly Logbook

Date/week	Material/seller ID	IN/stock	OUT/sales	Buyer ID	Kg	Unit Price (Mt/kg)	Total
	K3						
	SMW						
	HR1						
	ALM						
	FC						
	UBC						
	LDP						
	HDP						
	PET						
	2M						
						Total Sales	

Source: JICA expert team

10-4) Sales receipt

A sales receipt is issued to each customer of 3R Station when recyclables are received from the customer. The validity of the receipt is 90 days from the issuance due to the following reasons.

- According to lessons learnt from the AMOR Eco-points, it is very common that customers don't come every week to collect the incentives (purchased amounts at 3R station which are paid to customers next week).
- That is to say such costumers tend to receive the incentives until it reaches certain amounts.

Table 2.88 shows the form of sales receipts.

Table 2.88 Sales Receipt

3R Station (Name of ME)	
Date of Reception	/ /
Origin:	
Value to pay	
Client Signature	
Manager Signature	

Source: JICA expert team

10-5) Comment, question & complaint monitoring

In order to identify the costumers' comments, questions and complaints on the operation of 3R Station, a Comment, Question & Complaint Monitoring notebook to be filled out by customers has been prepared at 3R Station.

Table 2.89 shows the form of comments, questions and Complaints.

Table 2.89 Comment, Question and Complaint Monitoring Format

Date	Category of Customer 1. Srrouding People 2. Primary Collector 3. Secondary Collector 4. Others (specify)	Comment, Question and Complaint	Countermeasures taken/considered	Contact Person at 3R Station

Source: JICA expert team

2.4.6 Implement a Pilot Project for expansion of the recycling activities (cooperation with private sector) based on the result of Activity 4-2 (Activity 4-6)

1) Amount of collected recyclables

Purchase of recyclables at 3R station was terminated on 25th February 2016; payment was completed on 4th March; and the keys of the storage facility was returned from the operator to DMSC on 7th March. Based on the monitoring scheme described in the previous section, results of the pilot project through whole pilot project period are summarized below.

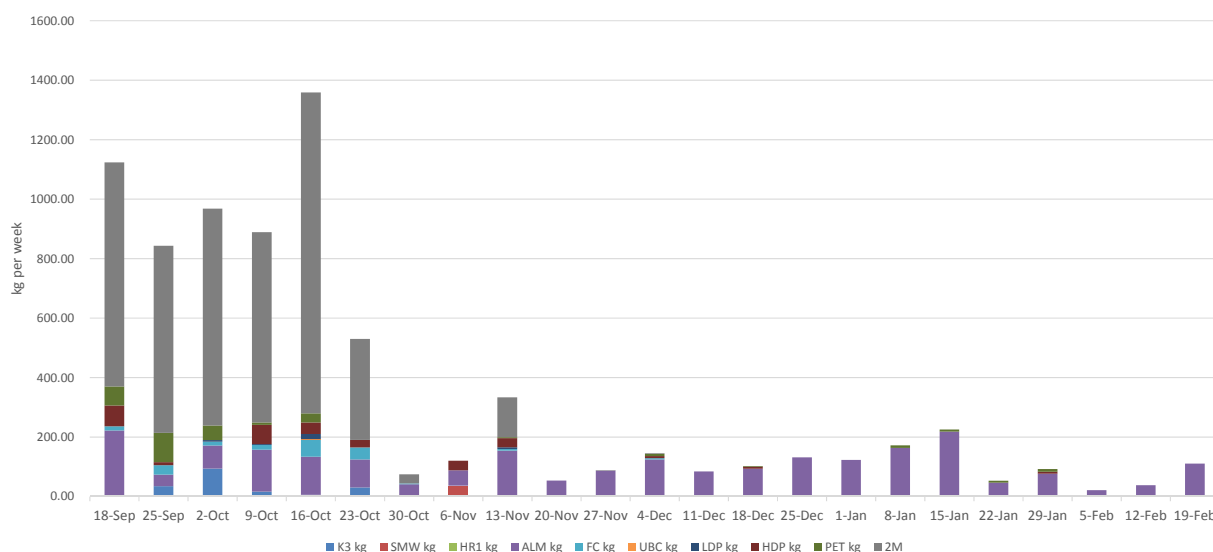
1-1) Trend of Recyclable Collection

The total amount of materials collected at the 3R station for the whole period of P/P from September 2015 to March 2016 was approximately 7,690 kg (220 kg of paper, 2,510 kg of metal, 620 kg of plastic and 4,340 kg of glasses). Here, amount of glasses or CDM bottles was originally monitored by unit and then converted into weight by assuming 0.55 kg/unit.

Trend of amount of collected recyclables is shown in Figure 2.53 (all materials). CDM bottles (2M) had been a major collected item until October 2015, but after that the collected amount of the bottles was drastically decreased. Since CDM bottles collected at the 3R station was not able to be sold to any buyer, purchasing of this item had been suspended from the beginning of December 2015. On the other hand, purchasing price of aluminum cans had been increased from the beginning of November 2015; afterwards it had become a major collected item.

There had been more variety of collected items in the first half of the operation (from September to the beginning of November 2015) such as PET bottles (PET), high density plastics (HDP), low density plastics (LDP), paperboard (K3) and food can (FC). However, collection of these materials was drastically

decreased and aluminum has become a major collected item in the second half of the operation (from the end of November).



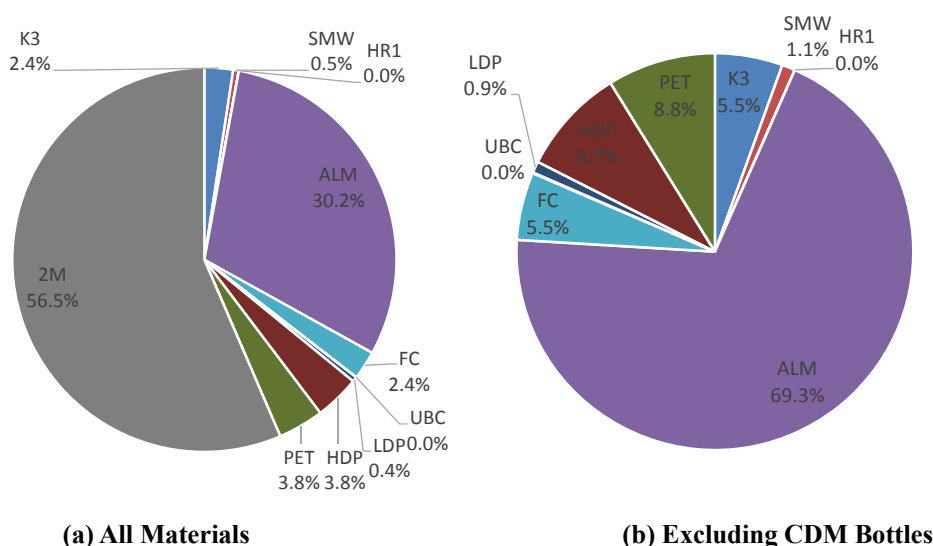
Note: K3: paperboard, SMW: white and color paper, HR1: shredded paper, ALM: aluminum can, FC: food can, UBC: iron can, PET: plastic bottles, HDP: high density plastic, LDP: low density plastic, 2M: returnable CDM bottles

Considering market situation of recyclables, purchasing price of aluminum has been increased from Mt 7 to Mt 9 on 2nd November 2015, and collection of CDM bottles had been suspended from 4th December 2015. Collection of other materials have been still continuing as of end of January 2016, but less amount have been collected compared to the initial period.

Source: JICA expert team

Figure 2.53 Trend of Collected Recyclables for 3R Station

The ratio of the collected recyclables for the whole period of P/P from September 2015 to March 2016 is summarized in Figure 2.54. Approximately 56% of the total amount were CDM bottles, which had been suspended its collection in December 2015 due to difficulty of selling and limited storage space (a in Figure 2.55). Excluding CDM bottles, aluminum cans (ALM) were 69%, plastics were 18% (LDP, HDP, PET), papers were 7% (K3, SMW) and food cans were 6% (FC) (b in Figure 2.54).



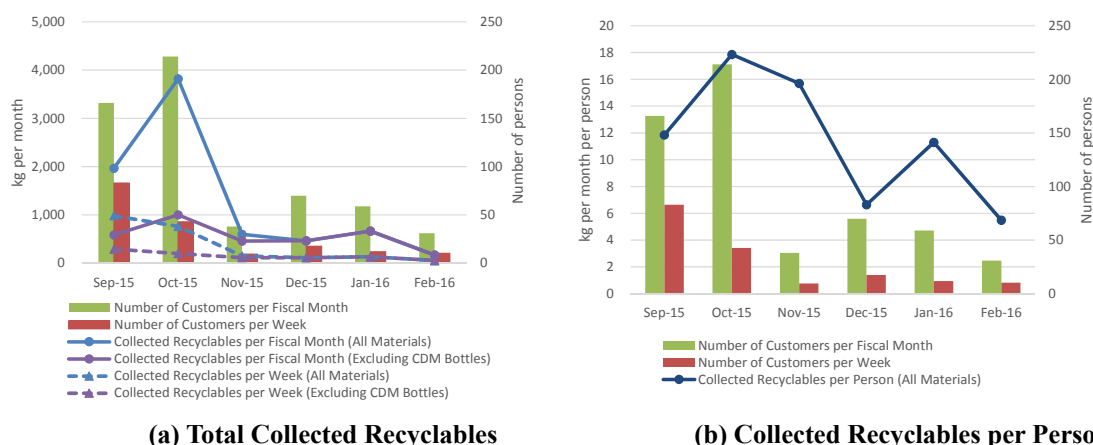
Note: K3: paperboard, SMW: white and color paper, HR1: shredded paper, ALM: aluminum can, FC: food can, UBC: iron can, PET: plastic bottles, HDP: high density plastic, LDP: low density plastic, 2M: returnable CDM bottles

Source: JICA expert team

Figure 2.54 Ratio of Collected Recyclables for 3R Station

As shown in (a) in Figure 2.55, number of customers per week had been gradually decreased from September (about 83 per week) to November (about 9.5 per week), and slightly increased in December 2015 (about 17.5 per week). After that, it has been continued with about 10.3 to 11.8 per week from January to February 2016. The amount of recyclables collected per week (excluding CDM bottles) has been also gradually decreased from September (about 290 kg/week) to November (about 120 kg/week) and had been stable in December 2015 (about 120 kg/week). Then, it has been slightly increased in January 2016 (about 130 kg/week), and significantly decreased in February 2016, right before the termination of P/P (about 60 kg/week).

In terms of amount of recyclables per person (per purchasing including CDM bottles), it has been varied from 6.6 kg/person to 17.9 kg/person, but it has been on a declining trend during the period of P/P (b in Table 2.56).



Note: Fiscal month is defined from the first Friday of the month. Length of each month is different: September for 2 weeks (due to beginning day of the 3R Station), October and January for 5 weeks, November and December months for 4 weeks.

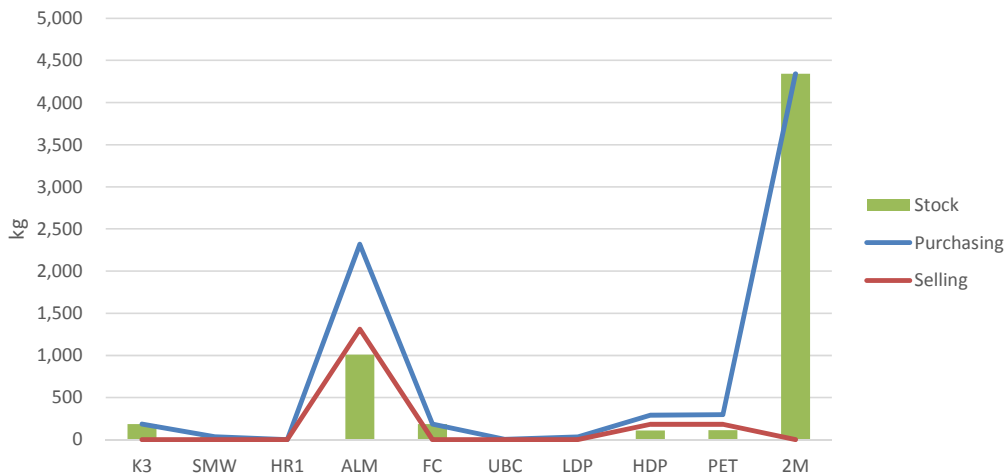
Source: JICA expert team

Figure 2.55 Trend of Number of Customers and Amount of Recyclables for 3R Station

1-2) Material Flow and Stock

Flow and stock of recyclables for the whole period of P/P from September 2015 to March 2016 is summarized in Figure 2.56. Here, the difference between purchased amount and sold amount are mainly caused by lacks of buyers and/or time lags between purchasing and selling.

According to the material flow data, as of time of termination of P/P in March 2016, only aluminum cans (ALM), high density plastics (HDP) and PET bottles (PET) have been sold. Irons (FC and UBC) and CDM bottles (2M) have never been sold due to lack of buyers in the period. Papers (K3, SMW, HR1) and low density plastics (LDP) have never been sold because the 3R station have not yet collected enough amount to sell them, and purchasing price by buyers have been lowered. Currently, high density plastics (HDP) and plastic bottles (PET) have no reasonable buyer around the 3R station due to relocation of the buyer. As a result, there is accumulation of recyclable items in the storage of the 3R station as shown in (a) of Figure 2.58. Apart from this, CDM bottles are accumulated in public space assigned by CMM in Chamanculo C Bairro as shown in (b) of Figure 2.57.



Note: K3: paperboard, SMW: white and color paper, HR1: shredded paper, ALM: aluminum can, FC: food can, UBC: iron can, PET: plastic bottles, HDP: high density plastic, LDP: low density plastic, 2M: returnable CDM bottles

Source: JICA expert team

Figure 2.56 Stock and Flow of Recyclables for 3R Station



(a) Storage in the 3R station

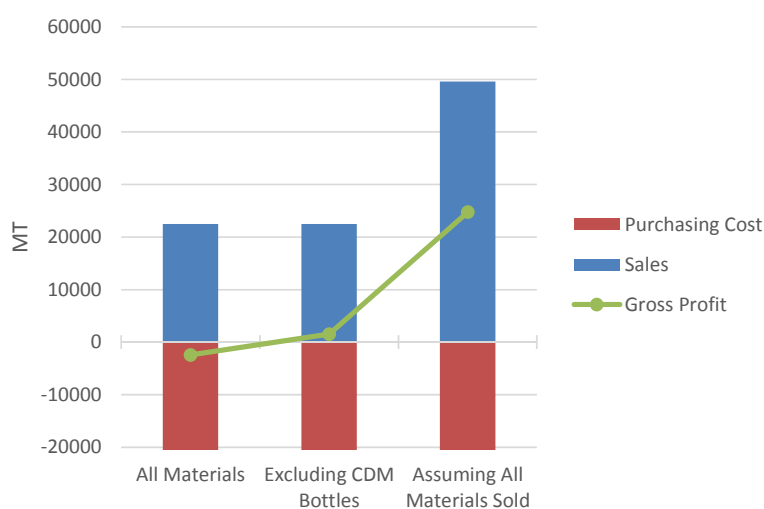
(b) CDM bottles stored separately

Source: JICA expert team

Figure 2.57 Accumulation of Recyclable Materials as of February 2016

2) Cash flow by trading valuables

Total cost of purchasing recyclables and sales of selling recyclables for the whole period of P/P from September 2015 to March 2016 is Mt 24,900 for all materials (Mt 20,900 excluding CDM bottles) and Mt 22,500 respectively. From this values, gross profit of the 3R station without considering other operational costs such as labor and other consumable costs (considering only purchasing cost) are -Mt 2,400 (deficit balance) for all materials (Mt 1,500 excluding CDM bottles). Based on assumption that all the remaining stocks are successfully sold with assumed market price (see notes in Figure 2.58), expected sales is Mt 49,600; purchasing cost is also Mt 24,900; and gross profit excluding labor and other consumable costs is Mt 24,700 as shown in Figure 2.58.



Note: Unit price for stocked recyclables are assumed as: 1.5 Mt/kg (K3), 1 Mt/kg (SMW, HR1), 16 Mt/kg (ALM), 1 Mt/kg (FC, UBC), 5 Mt/kg (LDP), 4 Mt/kg (HDP, PET), 1.2 Mt/unit (2M) according to hearing to AMOR and selling operation of 3R station

Source: JICA expert team

Figure 2.58 Cash Flow Analysis for 3R Station

3) Implementation cost

Initial cost and operational cost for the 3R station P/P is summarized in Table 2.90 and Table 2.91.

Table 2.90 Initial Cost for 3R Station

Category	Item	Cost (Mt)
Initial Cost for Facility	Storage Facility (Container)*	251,550
	Toilet**	64,750
	Water Supply Installment**	4,534
	Shade**	55,000
	Signboards**	67,860
	Sub-Total	443,694
Initial Cost for Campaign	Pamphlet**	86,580
	T-shirts and hats**	144,612
	Sub-Total	231,192
Initial Cost for Consumables and Others	Lock and Keys*	1,025
	Personal Protective Equipment***	6,200
	First Aid Kit**	3,390
	Fire Extinguisher**	3,522
	Raffia Bags**	20,340
	Scale (analog)*	1,400
	Scale (digital)**	6,950
	MITTADER License Application Fee**	70
Sub-Total		42,897
Total		717,782

Note: *Paid by JICA expert team, **Paid by DMSC, ***Paid by ME
Some small cost items such as consumables are not included in this table.
Source: DMSC/JICA expert team

Table 2.91 Monthly Operational Cost for 3R Station

Category	Item	Cost (Mt)
Operational Cost (Monthly)	Labor**	9,352
	Fuel***	224
	Water Supply***	250
Total		9,826

Note: *Paid by JICA expert team, **Paid by DMSC, ***Paid by ME

Monthly fuel cost was estimated based on a report from ME with assumption of distance is 14 km per one way.

Water supply cost was estimated based on typical case in the area because waste supply was not installed yet.

Source: DMSC/JICA expert team

Assuming that the initial cost for facility will be required every 10 years, the initial cost for campaign will be required every 5 years and initial cost for consumables and others will be required every year, the initial cost per year will be calculated as Mt 133,505. Besides, yearly operational cost can be calculated as Mt 117,912.

2.4.7 Review the result of the Pilot Project in Activity 4-6, and develop a plan for promotion of the Pilot Project (Activity 4-7)

1) Cost-effectiveness of valuables recovery activity

The estimated yearly revenue and expenditure for 3R Station P/P was summarized in the Table 2.92. Based on actual revenue realized in the P/P, financial balance of the P/P was -256,217 Mt/year, and when based on expected revenue, financial balance was estimated to be -202,017 Mt/year.

Table 2.92 Estimated Yearly Revenue and Cost for 3R Station P/P

Revenue/	Value (Mt./year)	Remarks
Actual Revenue	-4,800 Mt.	Calculated based on realized revenue in the P/P.
Expected Revenue	49,400 Mt.	Expected revenue when all stocked recyclables are sold.
Initial Cost for Facility	44,369 Mt.	Assumed that useful life of facility is 10 years.
Initial Cost for Campaign	46,238 Mt.	Assumed that campaign will be implemented every 5 years
Initial Cost for Consumables	42,897 Mt.	Assumed that useful life of facility is 1 year.
Yearly Initial Cost	133,505 Mt.	Total of above initial costs.
Yearly Operational Cost	117,912 Mt.	Calculated based on actual operational cost in the P/P
Balance (Actual)	-256,217 Mt.	
Balance (Expected)	-202,017 Mt.	

Source: DMSC/JICA expert team

The total amount of materials collected at the 3R station for the whole period of P/P from September 2015 to March 2016 was approximately 7,690 kg. Among that, the materials sold to recycler was approximately 1,678 kg. Therefore, cost effectiveness of the 3R Station P/P can be calculated in Table 2.93 below.

Table 2.93 Cost Effectiveness of 3R Station P/P

Calculation Base	Cost Effectiveness on Valuable Recyclables Recovery	Remarks
Actual Balance	76.3 Mt/kg	Mt 256,217 / (1,678 * 2) kg
Expected Balance	13.1 Mt/kg	Mt 202,017 / (7,690 * 2) kg

Source: DMSC/JICA expert team

2) Lessons learnt and recommendations

As the lessons learnt from the P/P implemented under the Project, issues raised during P/P and their countermeasures and recommendations were summarized in Table 2.94 below.

Table 2.94 Issues, Countermeasures and Recommendations for the 3R station

Category	Description of Issues	Countermeasures and Recommendations
Price, Storage and Recyclable Market	<ul style="list-style-type: none"> - There are continuous complaints by citizens that purchasing price are too low according to complaints books placed in the 3R station, and communication through the collaborators. - Particularly, there are competitive buyer of aluminum cans around the 3R station, and extensive complaints by customers to increase price have been raised. - Residents have stopped bringing recyclables because they are not satisfied with purchasing prices at the 3R station. - There was a request by citizens to accept other materials such as tab of drink can. 	<ul style="list-style-type: none"> - Price setting schemes under control of CMM considering recyclable market with transparency and equitability is necessary. - Purchasing price of aluminum has been increased from Mt 7 to Mt 9 on 2nd November 2015 by considering market price around the 3R station. - Continuous civic education campaign might be necessary in order to emphasize that the 3R station is not a business activity but for public benefit and reduction of waste.
	<ul style="list-style-type: none"> - It has been difficult to sell many of the recyclable items due to lack of buyers for most of the period of the P/P. Market of recyclable materials have gradually declined in the second half of 2015 or the period of P/P. - According to hearing to a stakeholder, there are no buyers of irons and PET bottles from approximately June and December 2015, respectively. Other materials still have market but prices have been declining. - A buyer have not accepted purchasing recyclables from the 3R station even if they have been buying from other suppliers: CDM bottles 	<ul style="list-style-type: none"> - Establishment of storage space for longer period to overcome fluctuating market situation of recyclable materials can be considered. - The ME could contact buyers in advance to transport and sell the recyclables to more than one buyer so that sales can be maximized. - Extensive negotiation between CDM and CMM have conducted so that CDM bottles from 3R station can be sold but was unsuccessful. Then, collection of CDM bottles had been suspended from 4th December 2015. - Part of the reason of unsold items can be lack of capacity of network by the operator of the 3R station. Supports by DMSC such as providing information about buyers can be considered.
	<ul style="list-style-type: none"> - Storage (container) of the 3R station tend to be full due to difficulty to sell some of the recyclable items and timing of selling recyclables. 	<ul style="list-style-type: none"> - CMM allocated public space to keep unsold CDM bottles in Chamanculo C Bairro. - Establishment of storage space for longer period to overcome fluctuating market situation of recyclable materials can be considered. - Organizing the stock in the 3R station such as packing the bottles on pallets could contribute on saving storage space.
	<ul style="list-style-type: none"> - Distinguishing ferrous and aluminum cans was initially difficult, and there might be miss-distinguishing to purchase ferrous as aluminum. 	<ul style="list-style-type: none"> - Magnets were provided to the worker of the 3R station to distinguish ferrous and aluminum. - Continuous training to workers of the 3R station is recommended.

Category	Description of Issues	Countermeasures and Recommendations
Operation	<ul style="list-style-type: none"> - Payment has been sometime delayed or not fully made in a designated day due to management failure such as bringing not sufficient money or start payment late. - There has been failure of opening of the 3R station at designated time. 	<ul style="list-style-type: none"> - Better communication between supervisor and workers of the 3R Station, and accurate calculation to close logbook is necessary to avoid unexpected failure of payment. - Better supervision of workers by supervisor of the operator is necessary to avoid unexpected closure or delay of opening time. - Monitoring by DMSC is necessary to avoid failure of management of the 3R station.
Operation Working Condition	- There was a substitute of a worker of the 3R station due to resignation of one worker.	- Continuous training to workers of the 3R station is recommended.
	<ul style="list-style-type: none"> - Construction of toilet and sunshade which are responsibility DMSC had been delayed. - Water supply to the toilet has not yet connected and installed shade has a leaking. 	<ul style="list-style-type: none"> - DMSC should appropriately secure budget and disburse the necessary costs for toilet and shade according to the agreement. - Repair of installed share is necessary.
Working Condition Surrounding Environment	- Procurement of some consumables such as hygiene equipment, first aid kit and fire extinguisher have been delayed or not yet conducted, which causes inappropriate working condition at the 3R station.	- DMSC should appropriately secure budget and disburse the necessary costs for consumables according to the agreement.
	- There had been delay of payments to the workers of the 3R station due to failure of provision of cost from DMSC to the operator.	- DMSC should appropriately secure budget and disburse the labor costs according to the agreement.
	- Customers had been tend to scatter remaining materials that could not be sold to the 3R station around there.	<ul style="list-style-type: none"> - The workers of the 3R station are cleaning around the 3R station. - Placing bins for residuals and continuous civic education are recommended.
Surrounding Environment Customer	- There used to be complains by the neighbors that customer waiting for selling recyclables are noisy.	- The operator of the 3R station had informed customers to be quiet.
	- There had been many children selling recyclables at the initial stage of operation. It had been observed that this behavior had been causing avoidance of attending school.	- The operational body of the 3R station had informed the children to prioritize their school, and this behavior was stopped.
Closure of P/P	- According to the collaborator, the neighborhood looks cleaner after opening of the 3R station, and the community have been requesting for the project to continue.	- Consideration of social impact by closure of the PP shall be examined.

Source: JICA expert team

2.4.8 Develop a plan for a Pilot Project for the utilization of organic waste (Activity 4-8)

1) Selection of target area

By the discussion with DMSC, UEM and JET, the two bairro shown in Table 2.95 were selected as target bairro by reasons described in the table.

Table 2.95 Two Bairros Selected for Household Organic Waste Recycling P/P

Bairro	Population	Description
Mahotas	47,508	Most of the households work in Agriculture in green valley, they have gardens and vegetable gardens in their house. The secretary and the ME are cooperative
Costa de sol	16,000	Households have gardens and vegetable gardens. The secretary and the ME are cooperative.

Source: JICA expert team

In addition to the neighborhood characteristics (location, population and etc.), the following criteria of were considered for the selection of households to be participated in the P/P.

- Household with a minimum of 5×10 m (about 50 m²) of garden
- Interested in participating in the P/P
- Willing to follow recommendation on composting production technology applied in the P/P
- Willing to utilize final product of the P/P in each household.

As result, the 35 households in total (17 HHs for Mahotas, 18 HHs for Costa de sol) were selected as participating households for the P/P.

2) Selection of target organic waste

As it was a first challenge for DMSC to implement organic composting activity, the target organic waste was selected in conservative manner. Target organic waste in the P/P was decided as “green waste” which was defined as fruit & vegetables, leaves (green), grass & hedge cuttings, etc. and “brown waste” which was defined as straw, sawdust, leaves (brown), wood, twigs & branches (in small pieces), etc. Animal origin organic waste such as leftover of meat and fish is also organic waste and degradable, however, it was excluded from the target waste as it attract emergence of pests and generate bad odor if it was not well managed and controlled during composting process. The target waste in the P/P was summarized in Table 2.96.

Table 2.96 Target Waste in the Organic P/P

Separation	Waste Type	Reasons
Target Biodegradable Organic Waste	Green Waste fruit & vegetables, leaves (green), grass & hedge cuttings, etc.	Help microorganism to obtain food to start decomposition
	Brown Waste straw, sawdust, leaves (brown), wood, twigs & branches (in small pieces)	Used as energy source for the microorganism
Not Target Biodegradable Organic Waste	Animal Origin Organic Waste	Attract emergence of pests (flies etc.) and generate bad odor
	Other Inorganic Waste	Are not decomposed

Source: JICA expert team

3) Composting method and operation procedure

There are several methods for composting as shown in Table 2.97 and it is necessary to select appropriate method considering technical and operational feasibility as well as acceptancy of households.

In general, it can be said that more careful and intensive operational management is required to produce high quality compost, conversely, high quality compost product cannot be expected when simple operational management is applied. Therefore, it is necessary to examine appropriate operational procedure considering households' experience and capacity.

Table 2.97 Candidate Composting Method Examined in the Organic P/P

Technological Model			Basic Structure	Key Materials	Photograph
No.	Category	Description			
1.	Pile	Without turning over	None	None	
2.	Pile	With turning over	None	None	
3.	Pit	Incorporation	Open a trench, needs protection barrier	None	
4.	In-vessel	With Plastic Bin	Plastic barrels with aeration holes, compost harvest holes and holding grill for inside	Reused Plastic Bins (210 L)	
5.	In-vessel	With Drum Can	Drum cans with aeration holes, compost harvest holes and holding grill for inside	Reused Drum Cans (210 L)	
6.	Pile for Tecnosol	With turning over (Tecnosol)	None	None	

Source: JICA expert team

In the course of technical examination of composting method among DMSC, UEM and JET, several method of composting i.e., pile method, pit method, in vessel method were examined and in vessel method with plastic bin was selected as composting method in the P/P by the reasons such as required space, operational safety, procurement cost and so on.

Regarding operational procedure, as summarized in Table 2.98, in order to make sure the sustainability of the daily operation of composting to be done by the target households, basically three steps with basic equipment and printed materials were introduced for the implementation.

Table 2.98 Operational Procedure of Composting in the Organic P/P

Step		Operation by HH	Principal Equipment		Printed Materials
Basic	1 st	Separate target waste into the designated bucket & fill out the logbook	One bucket ¹ for Target waste, another bucket ¹ for Not Target waste	Logbook ³ (weekly basis)	Leaflet ^{3,4} Manual ³ , Stickers ³ for each Bucket & Waste Recycle Bin
	2 nd	Weigh the bucket of separated waste & fill out the logbook	One simple scale		
	3 rd	Pour the separated waste into the waste Recycle Bin& fill out the logbook	Biodegradable organic waste recycle bin ²		
Other	4 th	If HH find something, fill out the logbook	Note: Operation difficulties and others if any		
	5 th	Utilize of the final product of P/P	Note: After the maturing of the target waste in the waste recycle bin ²	-	

1 : Recycled Plastic Bucket

2 : Reused Plastic Barrels originally used for glucose or sweetener

3 : printed in both Portuguese and Changana languages

4 : printed on a Recycled Paper

Source: JICA expert team

4) Implementation schedule

The organic waste recycling pilot project was implemented as shown in Table 2.99.

Table 2.99 Implementation Schedule of Activities for the Organic P/P

Activities	2014			2015												2016
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1
	JICA Project 2 nd Year						JICA Project 3 rd Year									
P/P Preparation																
P/P Implementation																
Monitoring 1																
Monitoring 2																
Monitoring 3																
Sampling and Analysis of Soil Conditioner																
Workshop			△				▲			▲		▲				▲
Interview Survey					△					▲						▲
Certificate to HH																▲
Certificate to MT												▲				▲
Gift to HH																▲

HH: Household, MT: Monitoring Team (UEM Students)

Source: JICA expert team

5) Development of operational manual

The operational manual which contains information and instructions as shown in Table 2.100 were developed by the technical support from UEM.

Table 2.100 Table of Contents of Operational Manual for Household Organic Waste Recycling

Chapter	Contents
Introduction	1.1 Problems 1.2 Objectives of the project 1.3 Benefit of the project
Outcome of Pilot Project	2.1 Performance of pilot project 2.2 Quality of soil conditioner
Best Practice of Soil Conditioner Production	
How to Use Soil Conditioner	
Frequently Asked Questions	
References	

Source: JICA expert team

6) Dissemination to residents

6-1) Explanatory workshop

An explanatory workshop as kick-off for P/P was held to describe, instruct and consult the P/P implementation in each Bairro respectively as shown in Table 2.101 and Figure 2.59. At the closing of each workshop, T-Shirts with a message of “Ajuda Reciclando o Lixo Biodegradável para uma Cidade Mais Limpa (Help by Recycling the Biodegradable waste for a cleaner city)” written on their back sides were distributed to all participants to promote the P/P implementation and enhance their knowledge on 3R.

Table 2.101 Explanatory Workshop on Initiation of the Organic P/P

Bairro	Date (2014)	Participants				Core Agenda
Mahotas	29 th Nov.	HHs :18	UEM :7	ME :1	DMSC :1	1. Waste problem in Maputo City and SWM 2. JICA Project 3. How to implement the P/P 4. Monitoring for the P/P 5. Troubleshooting on the P/P
		B.Sec. :1	JICA :3	expert team	Total 31	
Costa de sol	3 rd Dec	HHs :11	UEM :5	ME :1	DMSC :5	
		B.Sec. :0	JICA :5	expert team	Total 27	

HH: Household, ME: Microenterprise, B. Sec: Bairro Secretary

Source: JICA expert team



Source: JICA expert team

Figure 2.59 Scenery of Explanatory Workshop on Introduction of the Organic P/P

6-2) Intermediate and final workshops

With the aim of inspiring P/P performances, and sharing household activities and outcomes on P/P, a total of four (4) workshops was held as shown in Table 2.102 and Figure 2.60.

Table 2.102 Intermediate and Final Workshops for the Organic P/P

WS	Bairro	Date	Venue	Participants	Principal Agenda
1 st	Ma.	23 th Apr. 2015	Ma.BSO	HHsMa.: 10 ME:1* BS:1*	DMSC:5 UEM:2
	Co.	24 th Apr. 2015	Co.BSO	HHsCo.: 10	DMSC:6 UEM:6
2 nd	Ma.	24 th Jul. 2015 (PM)	Co.BSO	HHsMa.: 6 ME:1*	DMSC:7 UEM:7 JET:4
	Co.	24 th Jul. 2015 (AM)	Co.BSO	HHsCo.:12 MECo:1*	DMSC:5 UEM:7 JET:4
3 rd	Ma.&Co. (Joint)	18 th Sept. 2015	DMSC	HHsMa.:8 HHsCo.:16 MECo.1* BSMa.:1*	DMSC:7 UEM:7 JET:5
					HHs performance in P/P HHs difficulty in P/P HHs progress Opening discussion Troubleshooting P/P Problem Presentation on P/P progresses Experiences sharing among HHs Problems faced on P/P Interview with Questionnaire Certificates for HHs Presentation on P/P progresses P/P T-shirts for HHs and Monitoring team Certificate for Monitoring team

WS	Bairro	Date	Venue	Participants	Principal Agenda
4 th	Ma.&Co. (Joint)	29 th Jan. 2016	DMSC	HHsMa.:13 HHsCo.:16 ME:2* BS:1* CQ:6** DMSC:11 UEM:4 JICA Moz.: 2 JOCV:2 JET:7	Presentation on P/P results of two Bairros Presentation on Soil Conditioner Discussion Interview with Questionnaire Certificates for HHs and Monitoring team Gifts for HHs

WS: Workshop, Ma.: Mahotas, Co.: Costa do Sol, BS: Bairro Secretary, BSO: Bairro Secretary Office, HHs: Households, CQ: Quarter Head

*: included in HHs, ** Some are included in HHs

Source: JICA expert team



1st WS at Mahotas



1st WS at Costa do Sol



Greeting Remarks at 2nd WS



Interview Survey at 2nd WS

DMSC Explanation at 3rd WSP/P T-Shirt for HHs at 3rd WSC/P Presentation at 4th WSCertificates at 4th WS

Source: JICA expert team

Figure 2.60 Scenery of Intermediate and Final Workshops of the Organic P/P**6-3) Developing monitoring plan**

From January to December in 2015, the monitoring activities for the P/P in two Bairros of Costa do Sol (17 households) and Mahotas (17 households) were planned and carried out by the monitoring team consisted of C/Ps of DMSC, UEM staff and JICA expert team staff. By evaluating overall performances of the P/P shown by the target households in both Bairros, the monitoring activities were implemented by three different periods in 2015 as summarized in Table 2.103

Table 2.103 Monitoring Schedule for the Organic P/P

Monitoring	Period (2015)	Frequency /Week	Monitoring Schedule
1	Jan. to Mar.	Twice	Each day: Monitored all target HHs in each Bairro
2	Mar. to May	Twice	One day: Monitored HHs that shown slow performance of P/P Other day: Monitored all household of one neighborhood
3	May to Dec.	Alternative	One week: Monitored (one time) HHs that shown slow performance of P/P Subsequent week: Monitored (two times) all target households.

Source: JICA expert team

Activities of the Monitoring team are as follows and its scenery was shown in Figure 2.61.

- Instruct and consultate the P/P implementation to target households
- Monitor the households' performance of the expected implementing steps of the P/P.
- Replace the logbooks every week
- Fill out a monitoring sheet which consists of questions of physical composition, pest emergences, technical aspects and others



Source: JICA expert team

Figure 2.61 Scenery of Monitoring of the Organic P/P

2.4.9 Implement the Pilot Project for the utilization of organic waste (Activity 4-9)

1) Activity performance

1-1) Participation of households

During the overall P/P implementation period (Dec 2014 to Dec 2015), the households participated in the P/P can be summarized as shown in Table 2.104. Among those households, 4 households in total were dropped out from the P/P with the following reasons which were identified by the Monitoring Team.

- Lack of motivation and interest
- Family problems

Therefore, it can be simply calculated that dropout rates were about 6% and about 12% in Costa do Sol and Mahotas respectively as well as about 9% as a whole. Those dropped households were immediately replaced with other households in each Bairro.

Table 2.104 Household Participated in the Organic P/P

Bairro	No. of HH.	Education	Age	Main Economic Activity	Dropout
Costa do Sol	18	Primary School to Secondary School	28 - 72	Farmer, fisher, etc.	1
Mahotas	17	Primary School to University	20 - 56	Gardner, banker, farmer, administrator, etc.	2

Mahotas: Dropouts were replaced with other households

Costa do Sol: There was a household who dropped once but returned to P/P

Source: JICA expert team

1-2) Performance of composting

The performance of households on composting was monitored by indicators as below

- Proportion of the days households segregate target organic waste (%);
- Proportion of days households pour the separated organic waste into compost bin (%);
- Daily average amount of segregated organic waste (kg/day)

Table 2.105 and Table 2.106 show the results of monitoring of households performance. It should be noted that the proportion of day that households segregated target organic waste and poured the segregated organic waste into bin was about 45%, and the amount of organic waste segregated and processed for composting was 0.5 kg/household/day.

Table 2.105 Average Household Performance of the Organic P/P

Bairro	Total Monitored Day	Organic Waste Separation (%)	Pour Organic Waste into bin (%)	Amount of Separated Organic Waste (kg/day)
Costa do Sol	884	47.8	47.9	0.6
Mahotas	884	41.9	39.2	0.4
Total	1,768	44.9	43.6	0.5

Source: JICA expert team

Table 2.106 Maximum and Minimum Household Performance of the Organic P/P

Bairro	Organic Waste Separation (%)		Pour Organic Waste into bin (%)		Daily Separated Organic Waste (kg)	
	Max.	Min.	Max.	Min.	Max.	Min.
Costa do Sol	73.11	10.93	74.79	10.93	0.95	0.23
Mahotas	64.71	9.24	57.98	6.72	1.02	0.04

Source: JICA expert team

1-3) Quality of produced compost

The produced compost was sampled and analyzed at the UEM laboratory, and assessed by taking into consideration the following parameters: pH, TOC (total organic carbon), total nitrogen (T-N), C/N ratio and nutrients (Ca, P, Mg and K).

The results of the laboratory analyses and the quality assessments was summarized as shown in Table 2.107 and Table 2.108. As for the C/N ratio, only three (3) households were evaluated as “Moderate” and three (3) households were evaluated as “High” of the quality of C/N respectively.

Therefore, it should be noted that quality of compost produced by the methodology applied in the P/P was not good enough, and it is not recommended to be utilized as compost for farming purpose. The compost that can be produced by the methodology applied in the P/P would be appropriate to be utilized as soil conditioner for house gardening purpose. Consequently, a manual on soil conditioner utilization was developed by considering the analytical results, the assessments, and other factors identified through the implementation of the P/P.

Table 2.107 Result of Laboratory Analysis (pH, EC, TOC, TOP and TOC) and Assessment

HHs Code	Bairro	pH-H2O			pH-KCl			EC (mS cm-1)			T-N (%)			T-P (mg kg-1)			TOC (%)		
		Jul.	Nov.	Class.	Jul.	Nov.	Class.	Jul.	Nov.	Class.	Jul.	Nov.	Class.	Jul.	Nov.	Class.	Jul.	Nov.	Class.
MH10A05	Ma.	10.48	9.54	VSA	9.99	9.18	VSA	11.75	13.38	VSS	1.272	1.47	M	1852.83	2889.15	VH	6.41	13.3	VH
MH2311	Ma.	9.98	8.43	VSA	9.36	8.25	SA	3.97	6.45	VSS	0.665	0.49	VL	1245.17	403.92	M	7.76	3.15	VH
MH10A02	Ma.	9.22	8.84	SA	8.61	8.41	SA	3.21	6.14	VSS	1.307	1.68	M	2014	1980.33	VH	10.97	7.01	VH
MH249	Ma.	10.55	10.08	VSA	10.28	10.01	VSA	31	83.2	VSS	0.933	0.84	VL	1770.45	1565.19	VH	14.07	2.03	VH
MH703	Ma.	10.45	9.68	SA	9.79	9.56	VSA	5.59	22.3	VSS	0.758	0.56	VL	1080.42	1467.02	VH	2.81	4.26	H
MH1013	Ma.	8.79	9.98	SA	8.51	9.93	VSA	3.48	21.6	VSS	0.758	0.63	VL	1259.49	1374.45	VH	4.17	7.11	VH
MH2410	Ma.	9.43	7.96	SA	8.88	7.52	SA	7.14	9.08	VSS	1.05	0.98	L	1370.52	1363.23	VH	19.9	10.66	VH
CS6006	Co.	10.28	10.04	VSA	9.61	10.02	VSA	9.8	55.9	VSS	0.817	0.7	VL	1162.79	1304.33	VH	8.35	7.21	VH
CS4618	Co.	9.58	-	VSA	8.58	-	SA	5.36	-	VSS	1.015	-	L	1549.6	-	VH	8.54	-	VH
CS1805	Co.	7.89	8.27	MA	7.34	8.23	MA	8.52	15.95	VSS	2.042	0.56	VL	3549.3	1416.53	VH	16.45	12.29	VH
CS4608	Co.	10.52	-	VSA	9.92	-	VSA	9.05	-	VSS	0.583	-	VL	659	-	M	3.59	-	VH
CS1801	Co.	9.89	10.55	VSA	9.06	10.19	VSA	6.29	15.02	VSS	3.022	0.84	M	2649.12	1598.46	VH	17.67	5.92	VH
CS2213	Co.	10.38	-	VSA	9.45	-	VSA	5.58	-	VSS	0.583	-	VL	1691.66	-	VH	6.99	-	VH
CS2214	Co.	10.63	8.51	VSA	9.72	8.45	VSA	3.62	12.55	VSS	0.7	0.21	VL	1015.95	117.81	H	7.28	3.76	VH
CS7609	Co.	-	9.03	SA	-	8.85	SA	-	11.39	VSS	-	0.42	VL	-	409.53	M	-	4.67	VH
CS3110	Co.	-	10.43	VSA	-	10.1	VSA	-	24.3	VSS	-	0.49	VL	-	361.85	M	-	4.06	VH
CS2216	Co.	-	9.39	VSA	-	8.91	SA	-	5.61	VSS	-	0.42	VL	-	215.99	M	-	3.05	H

Class.: classification; VSA – Very strongly alkaline; SA – Strongly alkaline; MA – Moderately alkaline; VSS – Very strongly saline; M – Moderately; VL – Very low; L – Low; VH – Very high;

Quality of soil conditioner: Bad Not good Moderately Good Excellent

Ma.: Mahotas, Co.: Costa do Sol

Source: JICA expert team (UEM Laboratory Analyses)

Table 2.108 Result of Laboratory Analysis (C/N, C/P, Alkaline Cation and CEC) and Assessment

HHs Code	Bairro	C/N			C/P			Ca (cmol kg-1)			Mg (cmol kg-1)			Na (cmol kg-1)			K (cmol kg-1)			CEC (cmol kg-1)		
		Jul.	Nov.	Class	Jul.	Nov.	Class	Jul.	Nov.	Class	Jul.	Nov.	Class	Jul.	Nov.	Class	Jul.	Nov.	Class	Jul.	Nov.	Class
MH10A05	Ma.	5	4.2	VL	34.6	46	L	17.4	18.4	VH	1.4	11.6	VH	30.26	22.8	VH	33.09	38.3	VH	15.6	82.8	M
MH2311	Ma.	11.7	9	L	62.3	78	L	14.8	15.2	VH	2.4	3.2	H	17.85	1.95	H	16.54	2.32	VH	26.4	17.6	H
MH10A02	Ma.	8.4	7.6	L	54.5	35.4	L	20.2	31.2	VH	2.8	18	VH	19.01	3.09	VH	21.06	5.19	VH	32.8	42	H
MH249	Ma.	15.1	11.3	M	79.5	13	L	11.6	14.4	VH	2.8	12.4	VH	64.02	26.66	VH	69.37	41.9	VH	10.8	50.8	L
MH703	Ma.	3.7	2.4	VL	26	29	L	6.4	18	VH	1.6	7.2	VH	21.34	3.86	VH	27.07	6.38	VH	2.4	37.6	VL
MH1013	Ma.	5.5	10.9	L	33.1	51.7	L	10.6	34.8	VH	3.8	11.6	VH	15.13	15.84	VH	14.66	23.14	VH	12.8	39.2	M
MH2410	Ma.	19	10.4	H	145.2	78.2	L	5.6	36	VH	2	6.4	VH	21.73	7.73	VH	27.45	10.37	VH	19.2	33.6	H
CS6006	Co.	10.2	6.4	L	71.8	55.3	L	5.6	16.8	VH	1.6	6.4	VH	42.29	24.73	VH	45.87	34.71	VH	31.6	17.2	H
CS4618	Co.	8.4	-	L	55.1	-	L	9.2	-	VH	2.2	-	M	17.85	-	M	21.43	-	VH	17.2	-	H
CS1805	Co.	8.1	10.3	L	46.3	86.8	L	12.2	38.8	VH	5	10.4	VH	45.01	5.41	VH	47.75	8.78	VH	55.2	46.8	H
CS4608	Co.	6.2	-	VL	54.5	-	L	9.2	-	VH	1.4	-	M	30.65	-	M	32.34	-	VH	7.6	-	VL
CS1801	Co.	5.8	7.3	VL	66.7	37	L	10	40.8	VH	3.2	0.4	L	43.84	33.12	L	47.38	52.04	VH	60.4	45	VH
CS2213	Co.	12	-	M	41.3	-	L	13.8	-	VH	3.2	-	VH	38.73	-	VH	34.92	-	VH	26	-	H
CS2214	Co.	10.4	11.1	M	71.7	319.2	M	6.2	16	VH	2.2	6	VH	26.7	5.8	VH	25.22	7.98	VH	18	28	H
CS7609	Co.	-	21.9	H	-	114	M	-	19.6	VH	-	6.8	VH	-	5.02	VH	-	9.18	VH	-	10.4	L
CS3110	Co.	-	17.9	H	-	112.2	M	-	18	VH	-	3.6	H	-	0.47	H	-	0.48	H	-	22.8	H
CS2216	Co.	-	8.7	L	-	141.2	M	-	12	VH	-	2.4	M	-	1.45	M	-	1.54	H	-	12.8	L

Class. – Classification; VL – Very low; L – Low; M – Moderately; H – High; VH – Very high;

Quality of soil conditioner: Bad Not good Moderately Good Excellent

Ma.: Mahotas, Co.: Costa do Sol

Source: JICA expert team (UEM Laboratory Analyses)

2) Implementation cost

Initial cost and operational cost for the Organic P/P is summarized in Table 2.109 and Table 2.110.

Table 2.109 Initial Cost for Organic P/P

Category	Item	Quantity	Unit price (Mt)	Cost (Mt)
Composter	Plastic buckets (18L)	80	50	4,000
	Recycled plastic bins (from local Market)	43	1,305	56,100
	Adaptation of bins (labor)	43	692	29,750
	Necessary Parts (for composter)	43	815	35,027
Printing	Leaflet (PT 50 and Local 50)	100	111	11,115
	Manual (PT 50 and Local 50)	100	111	11,115
	Stickers for 2 buckets	80	111	8,892
	Stickers for bins	40	111	4,446
Workshop	Pens for households	100	10	1,000
	T-Shirts for households	100	211	21,060
	Glove for households	35	140	4,914
	Seeds (cabbage, lettuce and carrot) donation	105	35	3,675
	Snacks during the workshop (40 persons)	2	1,958	3,915
Monitoring Equipment	Weight scale (10kg)	34	201	6,817
	Thermometer	1	1,931	1,931
	Spade	2	713	1,425
	Mask	10	88	878
	Glove	10	152	1,521
	Binder	34	150	5,100
Total				212,680

Source: JICA expert team

Table 2.110 Operational Cost for Organic P/P (3 Months)

Category	Item	Quantity	Unit price (Mt)	Cost (Mt)
Monitoring	Allowance for surveyors (7 surveyors, twice a week for 3 months)	180	200	36,000

Source: JICA expert team

Assuming that the initial cost for composter and monitoring equipment will be required every 3 years, the initial cost for workshop and printing will be required every year, the initial cost per year will be calculated as Mt 117,648. Besides, yearly operational cost can be calculated as Mt 144,000.

2.4.10 Review the result of the Pilot Project in Activity 4-9, and develop a plan for promotion of organic waste utilization (Activity 4-10)

1) Cost effectiveness of household organic waste recycling activity

Yearly cost required for implementation of the Organic P/P was Mt 261,648. By investing this amount of money, the Organic P/P is expected to reduce 6,388 kg/year of organic waste (0.5 kg/day * 365 days * 35 households). Therefore, cost effectiveness of the Organic P/P can be estimated at 41.0 Mt/kg.

2) Lessons learnt and recommendations

The followings are major implications to updated M/P based on the lessons learnt from the P/P.

- Cooperation with households
Needless to say, household organic waste recycling project can only be implemented by obtaining cooperation from the households. As confirmed in the P/P, operational management of composting by households is tiresome work to do, and the final product of composting will not be as good as compost/fertilizer for farming purpose. Therefore, it is necessary for DMSC to encourage and motivate households by disseminating social benefit of this activity. Civic education activity on 3R promotion will be helpful to raise awareness of households.
- Improving quality of compost
As confirmed by the laboratory analysis conducted in the P/P, the quality of compost produced in the P/P was not good enough to utilize as compost/fertilizer for farming purpose and it can only be utilized as soil conditioner for house gardening purpose. It is desirable DMSC in collaboration with UEM and participating households continue improving operation of composting so as to produce better quality compost.
- Comparing effectiveness and efficiency with various recycling approach.
Comparison with the valuable recyclables recovery P/P and segregated waste collection P/P shall be necessary.
It was confirmed that cost effectiveness of household organic waste recycling P/P was 41.0 Mt/kg which was less than that of valuables recovery P/P and segregated collection P/P. Also, it should be noted that the target waste of organic P/P was different from the other P/P. This finding should be appropriately considered in the updated M/P.

2.4.11 Develop the Action Plan for expansion of the Pilot Project for valuables recycling and organic waste utilization (Activity 4-11)

In the updated M/P, valuable recyclables purchasing (3R station) in the suburban area was proposed from 2017, the 1st year of the M/P period. DMSC will aim to introduce 3R stations in 30 bairro by 2027, the target year of the M/P. The number of bairro introducing 3R station, required cost and estimated amount of recyclable recovered were summarized in Table 2.111.

Table 2.111 Action Plan for Valuable Recyclables Purchasing (3R Station) in the Suburban Area

Year	2017	2018	2019	2020	2021	2022
No. of 3R-station start operation	1	1	1	2	2	2
Total cost for valuables recovery (1000Mt.)	838	1,001	1,164	2,165	2,491	3,048
Amount of recyclables recovered (ton/year)	3	7	10	17	23	30
Potential amount of recyclables recovered (ton/year)	15	31	46	77	108	138

Year	2023	2024	2025	2026	2027
No. of 3R-station start operation	3	3	5	5	5
Total cost for valuables recovery (1000Mt.)	4,212	4,701	7,097	7,912	8,958
Amount of recyclables recovered (ton/year)	40	50	67	84	101
Potential amount of recyclables recovered (ton/year)	185	231	308	385	446

Source: JICA expert team

As for the organic waste utilization, household organic waste composting in the suburban area was proposed from 2017, the 1st year of the M/P period. DMSC will aim to introduce household composting in 1,500 households by 2027, the target year of the M/P.

The number of households introducing home composting, required cost and estimated amount of organic waste reduced were summarized in Table 2.112.

Table 2.112 Action Plan for Household Organic Waste Composting in the Suburban Area

Year	2017	2018	2019	2020	2021	2022
No. of HH start composting	50	50	100	100	100	100
Total cost for organic composting (1000Mt)	510	815	1,630	2,445	3,055	3,870
Amount of organic waste reduced (ton)	9.125	18.25	36.5	54.75	73	91.25

Year	2023	2024	2025	2026	2027
No. of HH start composting	200	200	200	200	200
Total cost for organic composting (1000Mt)	5705	6,925	8,350	10,185	11,405
Amount of organic waste reduced (ton)	127.75	164.25	200.75	237.25	273.75

Source: JICA expert team

2.5 Other Activities

2.5.1 Preparation and Holding of JCC

In order to ensure smooth implementation of the project activities, a Joint Coordinating Committee (JCC) was established in accordance with the R/D signed on 27 January 2012. The functions of the JCC are as follows:

- To facilitate inter-organizational coordination.
- To approve an annual work plan, review overall progress, conduct monitoring and evaluation of the Project.
- To exchange opinions on major issues that arise during the implementation of the Project.
- In total eight (8) JCC meetings were held in the project and their summary was shown in Table 2.113.

Table 2.113 Record of JCC Meetings

No.	Date	Summary of JCC
1 st	1 April 2013	The presentation of the project outline was made by the JICA Expert Team. The outline of the PDM, implementation structure of this project including the JICA Expert Team, JCC, and C/P, as well as the undertakings of CMM according to the R/D were explained. In addition, the work plan for the first project year was agreed upon.
2 nd	31 July 2013	The summary of the progress of the project was presented, including the preliminary review results of the existing M/P and the indicators of PDM. Preliminary results of the capacity survey and draft capacity development plan were also presented. To report the progress of the activities, the ownership of C/Ps was encouraged and most of the presentation was done by the C/Ps.
3 rd	9 June 2014	Explanation of the 1 st progress report and action plan was made by Mozambican C/Ps, and Introduction of the proposed revision of the PDM and 2 nd work plan was made by the JICA expert team. As the result of the third JCC, 2 nd work plan was successfully approved.
4 th	27 November 2014	The summary of the Mid-Term Review, consists of “achievement of the project activities”, “evaluation by 5 criteria”, “results and recommendations” and “contents of minutes of meetings”, was presented by the both Mozambican and Japanese members of the Joint Mid-Term Review Team. Wrap-up discussion was organized after that presentation and then Minutes of the Meetings on the project was mutually signed.

No.	Date	Summary of JCC
5 th	10 June 2015	Explanation of the 2 nd progress report and the 3 rd work plan was made by Mozambican C/Ps, and the modification of the PDM was made by the JICA expert team. After these reporting, wrap-up discussion was made among the all participants. As the result of the fifth JCC, the work plan for the third project year was successfully approved.
6 th	9 th June 2016	Explanation of the 3 rd progress report and the 4 th work plan was made by Mozambican C/Ps, and the modification of the PDM was made by the JICA expert team. After these reporting, wrap-up discussion was made among the all participants. As the result of the fifth JCC, the work plan for the fourth project year was successfully approved.
7 th	19 th August 2016	The summary of the Terminal Evaluation, consists of “achievement of the project”, “project implementation process”, “evaluation by five criteria”, “conclusions, recommendations and lessons learnt”, was presented by the both Mozambican and Japanese members of the Joint Terminal Evaluation Team. Wrap-up discussion was organized after that presentation and then Minutes of the Meetings on the project was mutually signed.
8 th	23 March 2017	This is the last JCC meeting of the project. 8 member of the C/Ps made each presentation introducing the project outline and the contents of the Master Plan which is one of the outcome of the project. Some of these presentation could be a practice for another similar presentation to be also introduced in the international seminar in April, 2017. Chief Advisor looked back 4 years of the project implementation by showing the photos. Then, together with the City Councilor and DMSC Director, the project was summarized through corresponding to the comments or questions raised by the participants.

Source: JICA Expert Team

2.5.2 Technical Support or Advises on non-project-related Activities of DMSC

One of the important non-project-related activity is the construction plan of new regional sanitary landfill in Matola municipality.

This project is the loan project of the economic development cooperation fund (EDCF) by Korea Eximbank. FNDS (former FUNAB) is the C/P of this project. In addition, Korea Engineering Consultants Corp. so called “KECC” was selected for the review of feasibility study including the basic plan and detail designing for the new landfill in the middle of 2016, and started its engineering works from August 2016.

According to KECC which were introduced in the environmental seminar on the Maputo day, outline of the project are shown below.

Table 2.114 Outline of the new sanitary landfill project

Project Site	Mathlemele (Northeast of Matola City)
Project Area	Maputo and Matola Cities
Acceptable Waste	Municipal Solid Waste (Non-Hazardous Waste)
Facilities	Sanitary Landfill - Capacity: 4,833,015 m ³ , Landfill Area : 322,700 m ² , Landfill Period : About 7.1 years
	Material Recovery Facility: 50 ton/day (Building accommodating up to 200ton capacity)
	Auxiliary facilities - Leachate treatment facility (50 ton/day), Administrative office, Weighbridge
Employer	Fundo do Ambiente (FUNAB)
Project Period	Total 30 months (Design: 12months, Supervision and Training : 18months)
Cost	Total construction cost : 60,825 thousand USD

Source: KECC, DMSC



No.	Facility	No.	Facility	No.	Facility
1	Sanitary Landfill	4	Administrative Office	7	Wheel Cleaner
2	MRF	5	Weighbridge	8	Access Road
3	Leachate Treatment Facility	6	Maintenance Road	9	Planned 2nd Project Site

Source: JICA Expert Team

Figure 2.62 Bird eye view of the new sanitary landfill

This investment shall cover only the 1st stage of the new sanitary landfill construction with the area of 50 ha for about 7.1 year's operation. The total life time of the sanitary landfill including another area of 50 ha for the 2nd stage is expected to be about 21 years. However, the detail financial source for the development of the 2nd stage is not clear at this moment.

Since the loan agreement of the project were concluded and signed on June, 2014, the boundary of the project site has already been marked to understand the existence of any dwelling within the site. On December 5, the team consists of representatives from both Maputo Municipality and Matola Municipality together with secretary of the local community visited to site and found some structures might be built by local people in the site.

DMSC organized another site visit by concerned people including JICA experts on February 6. NGO who attended the site visit asked about the existence of dwellers within the site and measures for their resettlement. It was replied that there was no dweller and Matola City was now taking care of the compensation to the people who were now using the land in the site for some agricultural activities. It was also informed that the contractor for the construct the surrounding fence had been already selected and the fence will be constructed as soon as possible when the construction supervisor will be determined.

However, it is observed that many people are still illegally inhabit in the site with their temporal or parament houses due to the construction of the new ring road near the project site, and this crucially causes a negative impact to proceed the landfill project. Therefore, concerned authorities including Matola Municipality that has the responsibility of resettlement of these people have been trying their effort such as the field survey to grasp the current conditions, identification of the people to be compensated, and negotiation to those people.

On the other hand, the tender for the closure of the existing Hulene dumping site including the waste dumping management until it will be closed was implemented and a prioritized bidder for contract negotiation was selected. However, since the offered price of the prioritized bidder was extremely expensive than the budget originally set by the CMM, the tender was canceled in March 2017 regardless of CMM's various kinds of efforts. The CMM is now considering to call another closure project under the PPP scheme.

Regarding the intermediate treatment of the waste to reduce or reutilize the waste, some international venders came to DMSC to promote their technologies. One of these technologies was the plasma gasification technology which gasify the waste with the plasma torch with extremely high temperature. This vender is approaching in the view of utilize the renewable energy generated by gasifying the both accumulated waste at the existing dumping site and fresh waste collected daily. A kind of promotion seminar was organized by FUNAB at DMSC on January 22, 2015 but any specific surveys and studies on Maputo case are not implemented yet.

This kind of movement of promotion of solid waste technologies shall be carefully assessed and it is proposed in the revised Master Plan that, only after the verification of the feasibility of these technologies, it might be considered as a treatment option in future.

JET had given the technical comments to these issues on the occasion requested by DMSC.

2.5.3 Semiannual Monitoring

In the course of the project, semiannual monitoring of the project activities was conducted in September 2013, February and September 2014, February and November 2015, February and September 2016 and February 2017. In the monitoring sheet, the actual progress and planned schedule for each activity of the four project outputs were compared and percentages of progress were evaluated.

As the result of the semiannual monitoring, it could be said the progress of the project was generally going well as planned, although some activities needed time more than expected due to some environmental factors like an unexpected absence of some C/Ps during the stay of JICA experts, unexpected time needed for the procurement of the good, etc.

2.5.4 Capacity Assessment

To assess the capacity of C/Ps, a capacity assessment sheet was prepared. In this assessment sheet, indicators to assess the capacity of C/Ps regarding each project activity were prepared. These indicators consist of the following three items per each activity:

- Result of learning about the activity
- Human capability to implement the activity
- Organizational capacity to sustain the activity

Capacity assessment was carried out by individual activities group for each output. First, C/Ps and JICA experts fill the assessment sheet respectively, and then both organized the joint meeting to compare the preliminary result. After the discussion, the evaluation result was finalized. It could be observed that the capacities for all output had improved slowly but certainly.





































The results of capacity assessment conducted during the project is summarized as shown in from Table 2.115 to 2.126.

Table 2.115 Result of Capacity Assessment (Output 1) (1/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
1-1 Review the existing M/P and identify differences compared to actual situation.	Q1(A)	We understand how to review the M/P to compare the actual situations.	1st	4
			2nd	4
			3rd	5
			4th	5
	Q1(B)	We can review the M/P and identify the differences between the descriptions in the M/P and actual conditions.	1st	4
			2nd	4
			3rd	5
			4th	5
	Q1(C)	The review result of the M/P is kept in DMSC and shared among others.	1st	4
			2nd	4
			3rd	5
			4th	5
1-2 Collect and review latest information and data of waste quantity and composition and final disposal volume.	Q2(A)	We understand what the latest information of SWM including waste quantity and quality at source and at the final disposal site is.	1st	3
			2nd	4
			3rd	4
			4th	5
	Q2(B)	We can collect and review the latest information of SWM including waste quantity and quality at source and at the final disposal site.	1st	3
			2nd	4
			3rd	4
			4th	4
	Q2(C)	Latest information of SWM including waste data is kept and update occasionally in DMSC.	1st	3
			2nd	4
			3rd	5
			4th	5
1-3 Update the existing M/P.	Q3(A)	We understand how to update the existing M/P based on the latest information.	1st	4
			2nd	4
			3rd	5
			4th	5
	Q3(B)	We can update the existing M/P	1st	3
			2nd	4
			3rd	5
			4th	5
	Q3(C)	Updated M/P is kept in DMSC and shared among others.	1st	3
			2nd	4
			3rd	5
			4th	5
1-4 Develop an Action Plan for the project period based on the updated M/P.	Q4(A)	We understand what kinds of action are necessary to be conducted from 2014 to 2017.	1st	2
			2nd	4
			3rd	5
			4th	5
	Q4(B)	We can develop the action plan based on the updated M/P.	1st	2
			2nd	3
			3rd	4
			4th	4
	Q4(C)	Action Plan is kept in DMSC and shared among others.	1st	1
			2nd	3
			3rd	3
			4th	5

Source: JICA Expert Team

Table 2.116 Result of Capacity Assessment (Output 1) (2/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
1-5 Develop a guideline of SWM for Maputo City.	Q5(A)	We understand what kind component is necessary for the guideline.	1st	 3
			2nd	 3
			3rd	 2
			4th	 5
	Q5(B)	We can develop the SWM guideline for CMM	1st	 2
			2nd	 2
			3rd	 2
			4th	 3
	Q5(C)	Guideline is kept in DMSC and shared among others.	1st	 2
			2nd	 1
			3rd	 3
			4th	 5
1-6 Set a target of SWM for post-termination of the Project and develop a draft of M/P.	Q6(A)	We understand what targets are appropriate for SWM after the project and how to develop the draft new M/P.	1st	 3
			2nd	 3
			3rd	 3
			4th	 4
	Q6(B)	We can develop the draft of new M/P with the targets of SWM after the project.	1st	 2
			2nd	 2
			3rd	 3
			4th	 4
	Q6(C)	Draft of new SWM M/P is compiled as the proposal of DMSC submitted to CMM.	1st	 1
			2nd	 1
			3rd	 3
			4th	 5
1-7 Develop the Action Plan toward 2021.	Q7(A)	We understand what kinds of action are necessary to be conducted for 5 years from 2017 to 2021.	1st	 2
			2nd	 3
			3rd	 3
			4th	 4
	Q7(B)	We can develop the action plan based on the M/P 2017.	1st	 2
			2nd	 2
			3rd	 3
			4th	 4
	Q7(C)	Action Plan is kept in DMSC and shared among others.	1st	 1
			2nd	 1
			3rd	 3
			4th	 5

Source: JICA Expert Team

Table 2.117 Result of Capacity Assessment (Output 2-1) (1/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
2-1 Review the situation of waste collection and transportation in Maputo City.	Q1(A)	We understand what kind of information and data is necessary and available to review the situation of urban waste collection and transportation in Maputo City.	1st	3
			2nd	3
			3rd	4
			4th	5
	Q1(B)	We can collect and analyze information and data on urban waste collection and transportation in Maputo City.	1st	3
			2nd	3
			3rd	4
			4th	5
	Q1(C)	The information and data on urban waste collection and transportation is kept and shared in DMSC.	1st	1
			2nd	3
			3rd	4
			4th	5
2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.	Q2(A)	We understand the existing problems of waste collection and transportation in urban area.	1st	4
			2nd	4
			3rd	4
			4th	5
	Q2(B)	We can make a hypothesis of measures to improve waste collection and transportation in urban area.	1st	2
			2nd	3
			3rd	4
			4th	5
	Q2(C)	The methodology and skill to prepare plan for the pilot project are shared in DMSC.	1st	1
			2nd	2
			3rd	3
			4th	5
2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.	Q3(A)	We understand key points that we have to pay attention in implementing the pilot project of waste collection in urban area.	1st	2
			2nd	1
			3rd	3
			4th	5
	Q3(B)	We can monitor, supervise and report the implementation of the pilot project according to indicators set in the plan.	1st	1
			2nd	1
			3rd	4
			4th	4
	Q3(C)	DMSC allocates necessary support and budget to promote implementation of the pilot project.	1st	1
			2nd	1
			3rd	2
			4th	3
2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3.	Q4(A)	We understand the results of the pilot project including difficulties we faced in the implementation of the pilot project.	1st	1
			2nd	1
			3rd	4
			4th	5
	Q4(B)	We can take necessary measures to improve the pilot project based on lessons learnt.	1st	1
			2nd	1
			3rd	4
			4th	4
	Q4(C)	The lesson learnt from the pilot project is shared among staff in DMSC and stakeholders including private sector.	1st	1
			2nd	1
			3rd	4
			4th	5

Source: JICA Expert Team

Table 2.118 Result of Capacity Assessment (Output 2-1) (2/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
2-8 Develop the Action Plan for improvement of waste collection and transportation.	Q5(A)	We improved skill and knowledge on waste collection through the project.	1st	1
			2nd	1
			3rd	1
			4th	4
	Q5(B)	We can develop action plan for waste collection in urban area in Maputo City for 2017-2021.	1st	2
			2nd	1
			3rd	1
			4th	3
	Q5(C)	Skill and knowledge acquired in the project are shared among staff in DMSC.	1st	1
			2nd	1
			3rd	1
			4th	4





































Source: JICA Expert Team

Table 2.119 Result of Capacity Assessment (Output 2-2) (1/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
2-1 Review the situation of waste collection and transportation in Maputo City.	Q1(A)	We understand what kind of information and data is necessary and available to review the situation of suburban waste collection and transportation in Maputo City.	1st	3
			2nd	3
			3rd	4
			4th	5
	Q1(B)	We can collect and analyze information and data on suburban waste collection and transportation in Maputo City.	1st	2
			2nd	2
			3rd	4
			4th	5
	Q1(C)	The information and data on suburban waste collection and transportation is kept and shared in DMSC.	1st	3
			2nd	2
			3rd	4
			4th	5
2-5 Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned.	Q2(A)	We understand how to formulate plan for recyclable collection in suburban area as well as required items for planning.	1st	2
			2nd	4
			3rd	4
			4th	4
	Q2(B)	We can formulate a plan for recyclable collection in suburban area considering restrictions and difficulty.	1st	2
			2nd	4
			3rd	4
			4th	4
	Q2(C)	The methodology and skill to formulate a plan for recyclable collection in suburban area are shared in DMSC.	1st	2
			2nd	2
			3rd	4
			4th	4

Source: JICA Expert Team

Table 2.120 Result of Capacity Assessment (Output 2-2) (2/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
2-6 Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5.	Q3(A)	We understand role of DMSC in supporting and collaborating with residents, MEs and recycling entities in implementation of recyclables collection in suburban area.	1st	 1
			2nd	 3
			3rd	 4
			4th	 4
	Q3(B)	We can monitor progress of implementation of recyclable collection in suburban area by setting indicators.	1st	 1
			2nd	 3
			3rd	 4
			4th	 4
	Q3(C)	DMSC allocates necessary support and budget to accelerate implementation of recyclable collection in suburban area.	1st	 1
			2nd	 2
			3rd	 2
			4th	 3
2-7 Review and feedback the result of the Pilot Project conducted in Activity 2-6.	Q4(A)	We understand how to evaluate recyclable collection in suburban area by setting indicators.	1st	 1
			2nd	 2
			3rd	 3
			4th	 3
	Q4(B)	We can examine necessary measures to improve recyclables collection in suburban area.	1st	 1
			2nd	 2
			3rd	 3
			4th	 3
	Q4(C)	DMSC take necessary measures to improve recyclable collection based on lessons learnt.	1st	 1
			2nd	 2
			3rd	 3
			4th	 3
2-8 Develop the Action Plan for improvement of waste collection and transportation.	Q5(A)	We improved skill and knowledge on recyclable collection through the project.	1st	 1
			2nd	 3
			3rd	 4
			4th	 4
	Q5(B)	We can develop action plan for improvement of recyclable collection in suburban area in Maputo City for 2017-2021.	1st	 1
			2nd	 1
			3rd	 1
			4th	 3
	Q5(C)	Skill and knowledge acquired in the project are shared among staff in DMSC.	1st	 1
			2nd	 2
			3rd	 3
			4th	 4





































Source: JICA Expert Team

Table 2.121 Result of Capacity Assessment (Output 3) (1/2)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
3-1. Review and analyze the current financial management of SWM to identify problems.	Q1(A)	We understand the financial operations of SWM and the institutional framework in which operates.	1st	3
			2nd	4
			3rd	4
			4th	5
	Q1(B)	We can identify obstacles in our financial operations and we can come up with strategies on how to overcome them.	1st	2
			2nd	3
			3rd	4
			4th	5
	Q1(C)	The financial management system is appropriate and responsive to the operational framework of the SWM.	1st	2
			2nd	2
			3rd	4
			4th	4
3-2. Collect periodical data on tax-and-spend of wastes every month.	Q2(A)	We understand the importance of a systematic way of recording, sharing and validating financial data.	1st	2
			2nd	4
			3rd	5
			4th	5
	Q2(B)	We can distinguish expenses and revenues per activity.	1st	2
			2nd	3
			3rd	5
			4th	5
	Q2(C)	There is easy sharing and recording of financial information.	1st	1
			2nd	2
			3rd	4
			4th	4
3-3. Enter the data and calculate annual budget and monthly expense.	Q3(A)	We understand importance of prompt and participative (inclusive) budget planning.	1st	2
			2nd	3
			3rd	3
			4th	4
	Q3(B)	We can calculate future revenues based on correct revenue base and estimate costs per activity of SWM.	1st	3
			2nd	2
			3rd	3
			4th	3
	Q3(C)	The revenues and expenses per activity are estimable and based on updated data.	1st	1
			2nd	2
			3rd	4
			4th	4
3-4. Develop annual financial report.	Q4(A)	We understand the need for transparency in our financial operations and we can promptly produce reports to be shared.	1st	1
			2nd	3
			3rd	4
			4th	4
	Q4(B)	We can develop and use financial models that will facilitate analysis and forecasting.	1st	3
			2nd	3
			3rd	4
			4th	4
	Q4(C)	Financial models allow quick analysis and forecasting.	1st	2
			2nd	2
			3rd	3
			4th	4

Source: JICA Expert Team

Table 2.122 Result of Capacity Assessment (Output 3) (2/2)

3-5. Develop annual budget planning.	Q5(A)	We understand the importance of easily coordinating with other departments to share information on finance and other operations of SWM.	1st		1
			2nd		3
			3rd		3
			4th		5
	Q5(B)	We can implement prompt and inclusive budget planning.	1st		2
			2nd		2
			3rd		4
			4th		4
	Q5(C)	The budget plan is based on updated and shared information on revenues and costs, as well as targets for the coming fiscal year.	1st		1
			2nd		2
			3rd		3
			4th		4
3-6 Review the waste service fee	Q6(A)	We understand the importance of everyone contributing to keeping the cleanliness of the City through paying cleaning taxes.	1st		1
			2nd		3
			3rd		5
			4th		5
	Q6(B)	We can calculate the cost of SWM for the City and assess the correctness of the cleaning fees.	1st		3
			2nd		2
			3rd		4
			4th		4
	Q6(C)	The cleaning fees are based on costs necessary to undertake the solid waste management of the City effectively.	1st		1
			2nd		2
			3rd		4
			4th		4
3-7 Develop the Action Plan for improvement of the financial management	Q7(A)	We understand the importance of doing realistic Action Plans.	1st		1
			2nd		3
			3rd		4
			4th		5
	Q7(B)	We can correctly forecast the revenues and costs related to SWM based on revenue base and activities.	1st		3
			2nd		2
			3rd		4
			4th		4
	Q7(C)	The Action Plan is based on correct assumptions and statistics.	1st		1
			2nd		2
			3rd		3
			4th		4

















































Source: JICA Expert Team

Table 2.123 Result of Capacity Assessment (Output 4-1) (1/3)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
4-1. Review the current status of recycling activities for recyclable materials (waste papers, glass, metals, and plastics) and organic wastes.	Q1(A)	We understand what kind of information and data are necessary and available to review the situation of recyclable materials in Maputo City.	1st	2
			2nd	4
			3rd	4
			4th	5
	Q1(B)	We can analyze present condition of recycling activities for recyclable materials based on the information and data collected in Maputo City	1st	3
			2nd	4
			3rd	4
			4th	5
	Q1(C)	The information and data on recyclable materials are kept and shared in DMSC.	1st	2
			2nd	3
			3rd	4
			4th	5
4-2. Study possibility for recycling of materials (including cooperation with waste pickers).	Q2(A)	We understand how to consider suitable materials to be selected for recycling as part of SWM in Maputo City.	1st	2
			2nd	4
			3rd	5
			4th	5
	Q2(B)	We can evaluate possibility for recycling of waste materials in the process of SWM considering cooperation with waste pickers in Maputo City.	1st	3
			2nd	3
			3rd	4
			4th	4
	Q2(C)	Know-how of the consideration and expectation for selecting waste materials and planning future material flows are shared in DMSC.	1st	2
			2nd	3
			3rd	4
			4th	4
4-5. Develop a plan for a Pilot Project for promotion of recycling activities (cooperation with private sector) based on the results of Activity 4-2.	Q3(A)	We understand how to formulate a plan for recycling activities.	1st	1
			2nd	3
			3rd	4
			4th	4
	Q3(B)	We can formulate a plan for recycling activities in cooperation with private sector.	1st	1
			2nd	2
			3rd	4
			4th	4
	Q3(C)	The methodology and skill to prepare plans for recycling activities in cooperation with private sector are shared in DMSC.	1st	1
			2nd	2
			3rd	4
			4th	4
4-6. Implement a Pilot Project for expansion of the recycling activities (cooperation with private sector) based on the result of Activity 4-2.	Q4(A)	We understand role of DMSC in supporting and collaborating with residents, associations, cooperatives, NGOs and recycling private entities in implementation of expansion of recycling activities.	1st	1
			2nd	1
			3rd	4
			4th	4
	Q4(B)	We can monitor progress of implementation of recycling activities by setting indicators.	1st	1
			2nd	1
			3rd	4
			4th	4
	Q4(C)	DMGRUSU allocates necessary support and budget to accelerate implementation of recycling activities as part of SWM.	1st	1
			2nd	1
			3rd	2
			4th	2













Source: JICA Expert Team

Table 2.124 Result of Capacity Assessment (Output 4-1) (2/3)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
4-7. Review the result of the Pilot Project in Activity 4-6, and develop a plan for promotion of the Pilot Project.	Q5(A)	We understand how to evaluate the recycling activities as part of SWM by setting indicators and develop a plan for promotion of the pilot project of the recycling activities.	1st	 1
			2nd	 1
			3rd	 3
			4th	 4
	Q5(B)	We can take necessary measures to improve and promote the recycling activities.	1st	 1
			2nd	 1
			3rd	 3
			4th	 4
	Q5(C)	DMSC takes necessary measures to improve and promote of the recycling activities based on lessons learnt.	1st	 1
			2nd	 1
			3rd	 3
			4th	 4
4-8. Develop a plan for a Pilot Project for composting of organic wastes (kitchen wastes).	Q6(A)	We understand how to formulate a plan for composting of organic wastes in Maputo City.	1st	 1
			2nd	 2
			3rd	 4
			4th	 4
	Q6(B)	We can formulate a plan for composting of organic wastes.	1st	 1
			2nd	 3
			3rd	 4
			4th	 4
	Q6(C)	The methodology and skill to prepare plans for composting of organic wastes are shared in DMSC.	1st	 1
			2nd	 3
			3rd	 3
			4th	 3
4-9. Implement the Pilot Project for the composting of organic wastes (kitchen wastes).	Q7(A)	We understand role of DMSC in supporting and collaborating with residents, associations, cooperatives, NGOs and Markets in implementation of composting of organic wastes.	1st	 1
			2nd	 3
			3rd	 4
			4th	 4
	Q7(B)	We can monitor progress of implementation of composting of organic wastes by setting indicators.	1st	 1
			2nd	 2
			3rd	 4
			4th	 4
	Q7(C)	DMGRUSU allocates necessary support and budget to accelerate implementation of recycling activities as part of SWM.	1st	 1
			2nd	 1
			3rd	 2
			4th	 2
4-10. Review the result of the Pilot Project in Activity 4-9, and develop a plan for promotion of composting.	Q8(A)	We understand how to evaluate the composting of organic wastes as part of SWM by setting indicators and develop a plan for promotion of the composting of organic wastes as part of SWM.	1st	 1
			2nd	 2
			3rd	 1
			4th	 4
	Q8(B)	We can take necessary measures to improve and promote the composting of organic wastes as part of SWM.	1st	 1
			2nd	 1
			3rd	 2
			4th	 3
	Q8(C)	DMSC takes necessary measures to improve and promote of the composting of organic wastes as part of SWM based on lessons learnt.	1st	 1
			2nd	 1
			3rd	 1
			4th	 2

























Source: JICA Expert Team

Table 2.125 Result of Capacity Assessment (Output 4-1) (3/3)

Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
4-11. Develop the Action Plan for expansion of the Pilot Project for valuables recycling and composting.	Q9(A)	We improved skill and knowledge on composting of organic wastes as part of SWM through the project.	1st	 1
			2nd	 1
			3rd	 1
			4th	 4
	Q9(B)	We can develop action plan for expansion of pilot project for valuables recycling and composting of organic wastes as part of SWM in Maputo City.	1st	 1
			2nd	 1
			3rd	 1
			4th	 3
	Q9(C)	Skill and knowledge acquired in the project are shared among staff in DMSC.	1st	 1
			2nd	 1
			3rd	 1
			4th	 4

Source: JICA Expert Team

Table 2.126 Result of Capacity Assessment (Output 4-2)

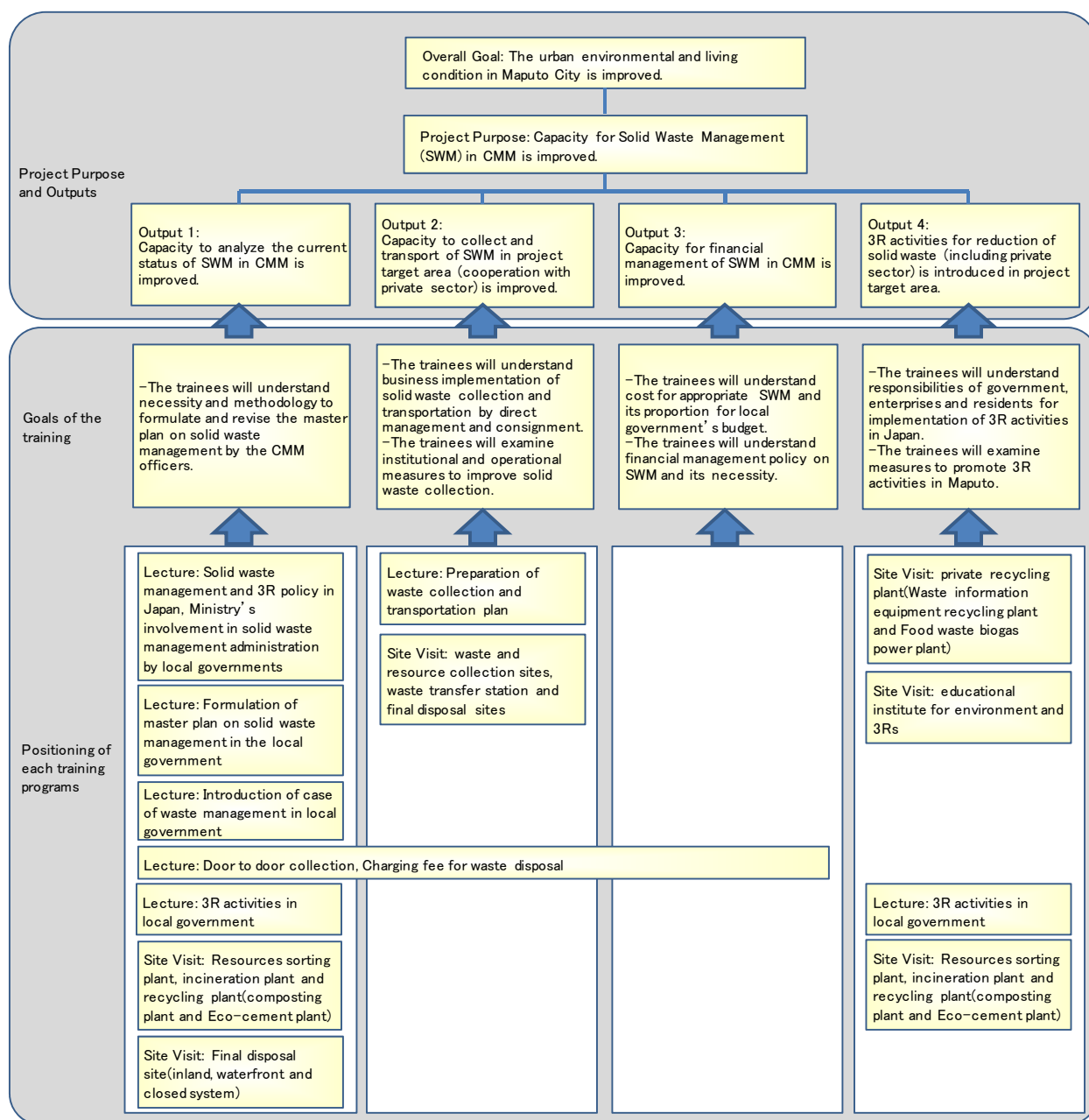
Activity	No.	Necessary Capacity to be Developed	Year	Evaluation
4-3. Review and improve public awareness raising programs for 3R introduction.	Q1(A)	We understand what the strategic planning for the public awareness raising program s for 3R introduction.	1st	 3
			2nd	 4
			3rd	 4
			4th	 5
	Q1(B)	We can develop the improved public awareness raising program through strategic planning for 3R introduction.	1st	 2
			2nd	 4
			3rd	 4
			4th	 5
	Q1(C)	DMSC organizes civic education meeting weekly regarding 3R introduction involving the related sections such as Section of Supervision and GECPAF, prepares the agenda, and shares the minutes of discussion.	1st	 2
			2nd	 3
			3rd	 5
			4th	 5
4-4. Implement improved programs for 3R introduction.	Q2(A)	We understand necessary arrangements for implementation of the improved program for 3R introduction.	1st	 2
			2nd	 3
			3rd	 4
			4th	 5
	Q2(B)	We can facilitate the concerned bodies for implementation of the improved program for 3R introduction.	1st	 1
			2nd	 1
			3rd	 4
			4th	 4
	Q2(C)	DMSC organizes civic education meeting with a section in charge of promotion of 3R and NGOs regularly, and shares the minutes of discussion.	1st	 1
			2nd	 4
			3rd	 5
			4th	 5

Source: JICA Expert Team

2.5.5 Third Country Training in Brazil

1) Training in Japan

Training in Japan was conducted from October 12 to 27, 2013 and eight members of the C/P participated in the training. Goals and contents of the training and their relationships with the project objectives are as shown in Figure 2.63.



Source: JICA expert team

Figure 2.63 Outline of the Training in Japan

The trainees visited local governments such as Shinjuku Ward, Chofu City, and Nagoya City, as well as private companies and listened to lectures on laws related to waste management in Japan, waste management master plans of local governments, and 3R activities. Furthermore, they made site visits to the final disposal sites, waste treatment facilities, and waste collection sites.

The training programs were evaluated quite productively. Particularly productive programs for the trainees are as shown below.

- Separated waste collection sites;
- Visit to incinerators and recycling facilities;
- Waste reduction by separation and activities for recycling-oriented societies;

- Waste management master plan of Nagoya City;
- Educational institute for the environment and 3R.

By widely acquiring the waste management master plans of the Japanese local governments, activities for 3R, as well as waste collection and transportation systems through the training, C/Ps and the JICA experts could share images of advanced samples of waste management. It was a significant achievement for C/Ps and the JICA experts to implement the project which supports the improvement of the CMM's capacity and to verify the various problems with regard to the promotion of 3R activities. The 3R activities and waste collection and transportation systems acquired from the training were utilized for the improvement of the waste management master plan, waste collection and transportation system, and installation of 3R activities in Maputo City.

2) Training in Brazil

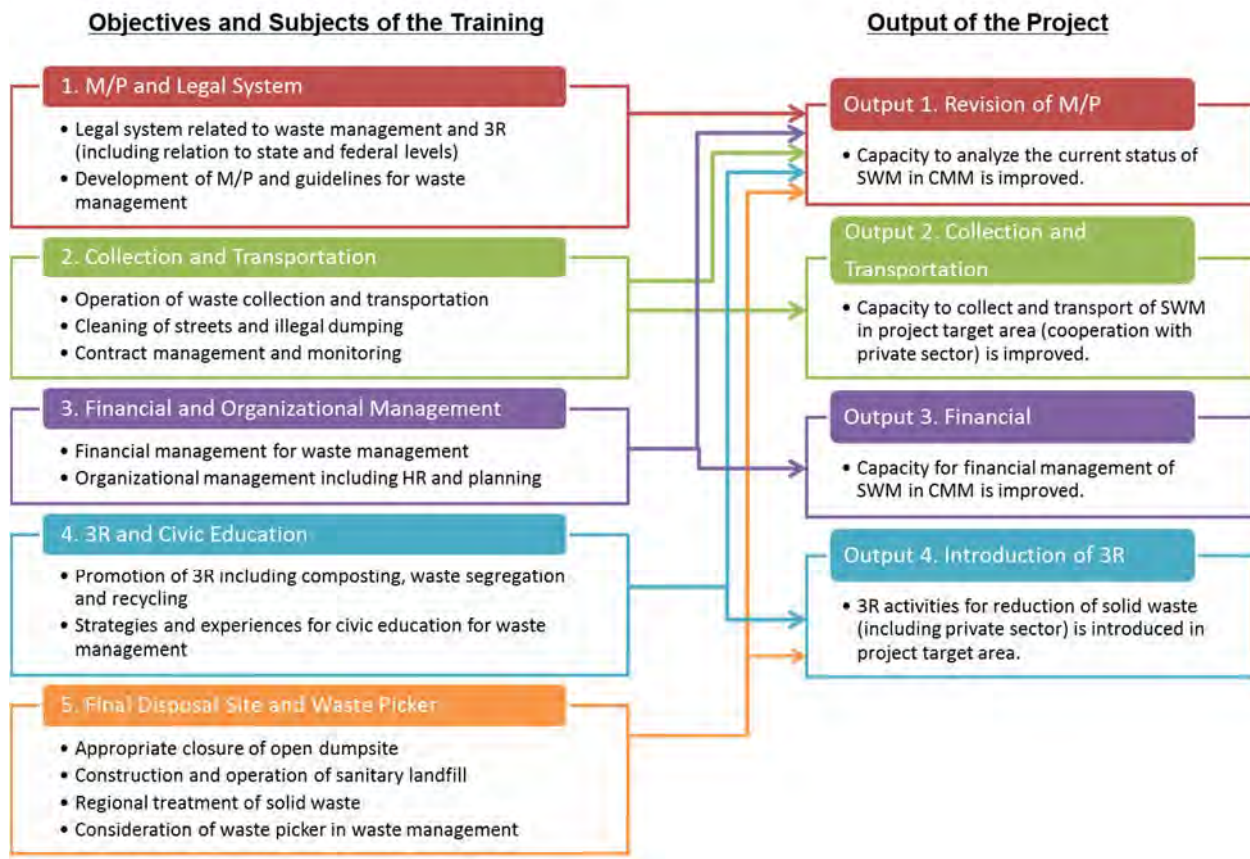
A training in Japan originally scheduled in the third project year was substituted by the third country training in Brazil. This substitution was based on the result of the training in Japan conducted in the first project year (October 2013) and the recommendation by the midterm evaluation.

- Period of Training: 26th September to 10th October 2015
- Number of Trainees: 8 people

Basis for conducting the training in Brazil is the followings;

- The trainees would have less language and culture barrier in a training in Brazil compared to one in Japan due to the fact that both countries are Portuguese speaking countries;
- Technologies, policies and systems covered in the training would be relatively feasible in Mozambique because Brazil is not a developed but an emerging economy;
- Comparison between cases in Japan, Brazil and Mozambique from the training in Japan in the first project year and the project activities in Mozambique can facilitate deeper understanding of trainees.

The relationship between the objective/subjects of the training and the outputs of the project are shown in Figure 2.64. Five training subjects corresponding to the project output 1 to 4 were established. In addition, revision of M/P for solid waste management in Maputo city was planned to be conducted in the third to fourth project years. Therefore, the training was not only to be utilized in the implementation of the P/P in Mozambique by acquiring deep understanding of policy and technology of solid waste management, but also for the trainees to learn broader knowledge and experiences that would be useful for updating the M/P.



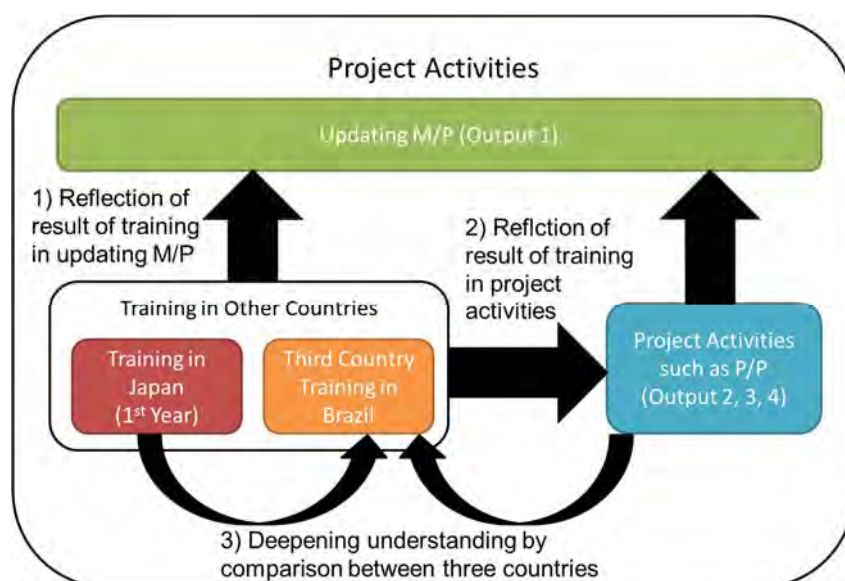
Source: JICA expert team

Figure 2.64 Outline of the Training in Brazil

The training containing five subjects had provided various theories and case studies for the series of system of waste management from collection and transportation to final disposal with technical, legal, planning and management perspectives as well as involvement of citizens.

The various results of the training were utilized in the project activities (Figure 2.65);

- Reflecting the Brazilian policies and discussion in the activity of revision of the M/P
- Reflecting the perceptions acquired from the training in the project activities such as recycling promotion P/P, organic waste utilization P/P, improvement of collection and transportation P/P, improvement of financial management and implementation of strategic civic education plan.
- Comparing knowledge and cases of Brazil and Japan at the phases of evaluations of P/Ps and other project activities for better understanding about the results of the activities.



Source: JICA expert team

Figure 2.65 Utilization of Training in Japan and Brazil

2.5.6 International Seminar on Solid Waste Management in African Countries

International Seminar with the purpose of the knowledge-sharing of the project and preparatory meeting for establishment of “African Clean Cities Platform” was held in Maputo from April 25 to 27, 2017.

On the first day, the overviews and outcomes of the project, especially on the topics of “Improving Efficiency of Waste Collection System”, “Financial Sustainability of Solid Waste Management”, “Approaches to Promote 3Rs”, were presented by 5 C/Ps, and then active discussions were made by the participants.

On the second day, strategic workshop, with the aim of the identification and sharing of solid waste management problems that African countries and municipalities are facing, was firstly organized. Then, it was confirmed that all the participants from African countries, UN organizations, private sectors and NPOs expressed their expectation and desire for their contributions on the proposed objective and activities of the platform.

On the third day, as a final conclusion of the seminar, the establishment of “African Clean Cities Platform” was declared by adopting the “Maputo Declaration”. Participants for the seminar is summarized below.

Table 2.127 Number of Participants for the Seminar

Countries or Organizations	Number of Participants
African Countries except Mozambique (23 countries) Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Morocco, Mozambique, Niger, Nigeria, Namibia, Republic of the Congo, Senegal, South Sudan, Sudan, Uganda, Zambia, and Zimbabwe	45
Mozambique including C/Ps	68
UNEP, UN-HABITAT and Center for SDGs in Africa	6
Japanese Concerned (Ministry of Environment, JICA HQs and Offices in Africa, Embassy of Japan in Mozambique, City of Yokohama, JETRO, Private Company, JICA Expert Team and JCV)	37
Total	156

Source: JICA expert team

Agenda of the Seminar is also shown below.

Knowledge-Sharing Seminar on Waste Management and Preparatory Meeting for Establishing “African Clean Cities Platform”

1. Date and Venue

Date: Tuesday 25 - Thursday 27 April, 2017

Venue: Hotel Avenida, Maputo, Mozambique

2. Language

English, Portuguese and French (with simultaneous interpretation)

3. Co-organizers

Maputo Municipality, Ministry of Land, Environment and Rural Development (MITADER), Ministry of the Environment of Japan (MOEJ), Japan International Cooperation Agency (JICA), UNEP, UN-HABITAT

4. Co-chairs

Mr. Celso Ismael CORREIA, Minister, Ministry of Land, Environment and Rural Development (TBC)

Mr. Tadahiko ITO, State Minister, Ministry of the Environment of Japan (TBC)

Mr. David SIMANGO, President of Municipal Council, Maputo Municipality, Mozambique (TBC)

5. Program

Day 1: Final Seminar on “the Project for Promotion of Sustainable 3R Activities in Maputo”

Time	Contents
07:30-08:50	0. Registration
08:50-09:00	1. Cultural Exhibition
09:00-09:10	2. National Anthem of Mozambique (Municipal Police Choir)
09:10-09:30 (20 min)	3. Welcoming Remarks <u>Mr. David Simango</u> , President of Municipal Council, Maputo Municipality, Mozambique <u>Mr. Hiroshi Ono</u> , Director, Policy Planning Division, Waste Management and Recycling Department, Ministry of the Environment of Japan
09:30-9:45 (15 min)	4. Family Photo
9:45-10:05 (20 min)	<i>Tea Break</i>
	5. Presentation of Mozambican Project
10:05-10:20 (15 min)	(1) Overview of the Project for Promotion of Sustainable 3R Activities in Maputo <u>Ms. Luisa Bila</u> , Directorate for Waste Management and Cemeteries, Maputo Municipality
10:20-11:10 (50 min)	(2) Session 1: Improving Efficiency of Waste Collection System <u>Ms. Meriamo Stela</u> , Directorate for Waste Management and Cemeteries, Maputo Municipality (Q&A and Open discussion, sharing knowledge/experience by participants)
11:10-12:00 (50 min)	(3) Session 2: Financial Sustainability of Solid Waste Management <u>Ms. Adelina Mocubela</u> , Directorate for Waste Management and Cemeteries, Maputo Municipality (Q&A and Open discussion, sharing knowledge/experience by participants)

Time	Contents
12:00-13:10 (70 min)	<i>Lunch</i>
13:10-14:00 (50 min)	(4) Session 3: Approaches to Promote 3Rs (Reduce, Reuse and Recycle) <u>Mr. Sergio Manhique</u> , Directorate for Waste Management and Cemeteries, Maputo Municipality (Q&A and Open discussion, sharing knowledge/experience by participants)
14:00-15:30 (90 min)	6. Panel Discussion Moderator: <u>Mr. Shungo Soeda</u> , Chief Adviser of JICA Expert Team, Maputo 3R project Panelists: <u>Mr. Hiroshi Ono</u> , Director, Policy Planning Division, Waste Management and Recycling Department, Ministry of the Environment of Japan <u>Prof. Abdouraman Bary</u> , Regional Office for Africa, UNEP <u>Dr. Naison Mutizwa-Mangiza</u> , Director, Regional Office for Africa, UN-HABITAT <u>Mr. Florentino Ferreira</u> , City Councilor of Maputo, Maputo Municipality
15:30-15:50 (20 min)	<i>Tea Break</i>
15:50-16:05 (15 min)	7. Presentation of the New Sanitary Landfill <u>Mr. Carlos Seventine</u> , National Sustainable Development Fund (FNDS)
16:05-16:40 (35 min)	8. Inauguration of the National Solid Waste Management Federation (ANGER), initiated by Mozambican Solid Waste Managers <u>Mr. João Mucavele</u> , Directorate for Waste Management and Cemeteries, Maputo Municipality (Q&A and Open discussion, sharing knowledge/experience by participants)
16:40-16:50 (10 min)	9. Concluding Remarks <u>Mr. Katsuyoshi Sudo</u> , Chief Representative of Mozambique office of JICA <u>Mr. David Simango</u> , President of Municipal Council, Maputo Municipality, Mozambique
17:00-18:00	<i>Welcome cocktail</i>
18:00-	<i>Reception</i>

Day 2: Preparatory Meeting for Establishing “African Clean Cities Platform”

Time	Contents
9:00-9:05 (5 min)	1. Introduction of the Preparatory Meeting <u>Mr. Kazunao Shibata</u> , Director of Environmental Management Group, Global Environment Department, JICA
9:05-9:20 (15 min)	2. Analysis of the Questionnaire on Waste Management in Participating Countries <u>Ms. Nao Takeuchi</u> , Waste Management Expert, Urban Basic Services Branch, UN-HABITAT
9:20-9:30 (10 min)	3. Introduction of Workshop <u>Dr. Mitsuo Yoshida</u> , Technical Advisor on Waste Management, JICA

Time	Contents
9:30-11:30 (120 min)	4. Workshop on Problem Identification and Analysis with Tea Break Facilitator of Group 1 (English): <u>Dr. Mitsuo Yoshida</u> , Technical Advisor on Waste Management, JICA Facilitator of Group 2 (English): <u>Dr. Naison Mutizwa-Mangiza</u> , Director, Regional Office for Africa, UN-HABITAT Facilitator of Group 3 (French): <u>Prof. Abdouraman Bary</u> , Regional Office for Africa, UNEP
11:30-11:45 (15 min)	5. Presentation to Share the Experience of Yokohama City <u>Mr. Fujio Onaka</u> , Director General, Resources and Waste Recycling Bureau, City of Yokohama, Japan
11:45-13:00 (75 min)	<i>Lunch</i>
13:00-13:30 (30 min.)	6. Inter-group Presentation on the Results of Workshop
13:30-14:00 (30 min)	7. Improvement of Data Collection and Monitoring for SDGs <u>Ms. Nao Takeuchi</u> , Waste Management Expert, Urban Basic Services Branch, UN-HABITAT
14:00-14:30 (30 min)	8. Access to the International, Domestic and Private Financial Resources <u>Ms. Cecilia Njenga</u> , Head, South Africa Country Office, UNEP
14:30-14:45 (15 min)	<i>Tea Break</i>
14:45-15:15 (30 min)	9. Initial Plan of “African Clean Cities Platform” <u>Mr. Kazunao Shibata</u> , Director of Environmental Management Group, Global Environment Department, JICA
15:15-17:15 (120 min)	10. Discussion on the Platform (5min. X 24 countries and Private Sector) Moderator: <u>Mr. Kunihiro Yamauchi</u> , Director General, Global Environment Department, JICA

Day 3: Preparatory Meeting for Establishing “African Clean Cities Platform” (cont.)

Time	Contents
8:30-11:00 (150 min)	Site Visit <ul style="list-style-type: none"> - Hulene existing landfill in Maputo - Private Recycling Facilities
11:30-12:30 (60 min)	<i>Lunch</i>
12:30-14:00 (90 min)	1. Review of Discussion and Further Opinions from the Floor (e.g. UNs and City of Yokohama) Moderator: <u>Mr. Kunihiro Yamauchi</u> , Director General, Global Environment Department, JICA 2. Discussion on the Draft Closing Declaration Moderator: <u>Ms. Ivete Maibaze</u> , Director, National Directorate for the Environment, MITADER <u>Mr. Hiroshi Ono</u> , Director, Policy Planning Division, Waste Management and Recycling Department, Ministry of the Environment
14:00-15:00 (60 min)	<i>Tea Break</i>
15:00-15:40 (40 min)	3. Launching Session 1) Presentation on the Platform <u>Mr. Gosai Ahmed Mohammed Hamdalla</u> , Waste Management Director, Ministry of Environment, Natural Resources and Physical Development, Sudan 2) Presentation on the Declaration <u>Mr. Raul Conde Marques Adriano</u> , President of Municipal Council of Chimoio, Mozambique 3) Closing Remarks <u>Mr. Celso Ismael Correia</u> , Minister, Ministry of Land, Environment and Rural Development <u>Mr. Tadahiko Ito</u> , State Minister, Ministry of the Environment of Japan <u>Mr. David Simango</u> , President of Municipal Council, Maputo Municipality, Mozambique
15:40-16:00 (20 min)	4. Family Photo

3. ISSUES AND ITS SOLUTION, AND LESSONS ARISEN DURING PROJECT

3.1 Overall matters

- Generally, the attitude of the C/Ps towards the project was very positive and they were eager to participate in the project activities as much as possible. However, especially in the first and second years of the project, the C/Ps could not always join the project activities due to their ordinary work or involvement to other projects such as MOPA.
- In addition, Mozambican custom that C/Ps took a paid leave for about one month every year was one of the difficulties for JET to implement the Project.
- Therefore, considering such actual availability of the C/Ps, the JICA Expert Team formulated the activity groups consisting of several members, with at least two C/Ps and JET members. The teams were determined by the category of project outputs in order to secure continuous activity. When a certain C/P leaves the project for a while, DMSC appointed an alternative staff to attend the group. This staffing arrangement was done through the whole project period by changing and adding the members.
- One of the successful outcome of the project is the implementation of the bi-weekly progress meeting. In the first year of the project when this progress meeting was introduced, the meeting agenda used to be prepared by JET and most of presentations at the meeting were also given by JET because the purpose of the meeting at that time was rather focusing to let C/Ps understand the project firmly. Then, the contents of the progress meeting had been slightly changed so that participants could be shared not only the progress of the project activities conducted by other C/Ps but also other solid waste management information such as the progress of construction of the new sanitary landfill.
- At the final stage of the project, the meeting agenda was mostly prepared by the head of the Monitoring and Planning Department, and number of the participants was over 20 including DMSC Director to exchange their views and opinions very openly. It was agreed at the last progress meeting of the project period that this bi-weekly meeting would be continued for the purpose of the monitoring of the activities proposed in the revised Master Plan.
- It should be also reported that each C/P, though there is individual variation, has improved his/her sense of purpose and work attitude, on not only the work related to the project but also to their daily routine works. For example, the keyword, “Master Plan”, was often expressed from the C/Ps during the later stage of the project period, because the experiences of the project activities including the implementation of the pilot project were to be reflected to the contents of the Master Plan.
- In addition, it was observed that sometime some C/Ps showed their attitude to be willing to complete their task by the designated deadline by doing overtime work in the later stage of the project period. At the beginning period of the project, the C/Ps naturally used to work for only limited office hours even during the busiest season with low attention on the deadline of the work. One of the reason of the overtime work might be because of some supplemental tasks of not only this project but also other activities, affecting the work load of the C/Ps. These supplemental work, sometime, might be lied heavily on the limited DMSC staffs who can accept the overtime work. Therefore, equality of work allocation and fair evaluation on the result of work shall be expected to conduct in the DMSC.
- Another remarkable point on the improvement of capacity and awareness of C/Ps is due to the result of the overseas trainings in Japan and Brazil implemented in the project. It should be said that the training schedule was quite tight and the C/Ps were so tired every day after the training. However, it was very impressive that participated C/Ps showed their serious attitude, regardless of difference of their positions, on tackling to the feedback session which was held sometime during the training

period, without any dropout person. Other opportunities of various trainings in Japan were also given to other DMSC C/Ps during the project period.

- These experiences of the training shall not be kept within the participated C/Ps, and should be devotedly shared with other staff of DMSC who did not participate in the training. On the other hand, other staff shall not think this is other people's affaires, but shall take this opportunity positively to understand what their colleague learned from the training. This learning attitude will surely improve the organizational capacity of DMCS. The provision of these opportunities of training and education is expected to be continued as the occasion demands.
- CMM/DMSC organized three-days seminar on the integrated solid waste management in Namaccha in November, 2015 to exchange the experiences of other municipalities in the southern part of Mozambique and to discuss the future aspects of the country. CMM/DMSC aims to transfer its experience obtained through not only this project but also other activities to other municipalities and also appeal to the central government such as MITADER for creating the national level rules and regulations with its strong enthusiasm to achieve the overall goal of this project, which is "The urban environmental and living condition in Maputo City is improved".
- Following such nation-wide seminar, International Seminar held in April 2017, which is Knowledge-Sharing Seminar on Waste Management and Preparatory Meeting for Establishing "African Clean Cities Platform", was the very valuable opportunity for DMSC to show the result of the project with their improved capacity to the guests invited from other African countries.
- Related to this Seminar, it should be also noted that "National Solid Waste Manager's Association (ANGER) was established with Mozambican C/Ps' own initiative as one of the result of the project. It is expected that activities under ANGER will be more concretely and actively.

3.2 Matters for Output 1

- Because the existing M/P was prepared mainly by foreign consultants in 2007, almost all C/Ps did not participate in the preparation process of the M/P. Only few C/Ps had experiences in reviewing the M/P for the regular monitoring. In order to let the C/Ps have ownership of the M/P, they have been given time to review the M/P, read it with their own eyes, think through it with their own brain, and write their opinions with their own hands, as much as possible, although it could be easier for the JICA experts to review it by themselves. Considering the current capacity of the C/Ps, it had taken longer than expected for them to review the M/P in the plan of operation (PO). Still, these patient experiences would certainly improve the capacity of the C/Ps. As a result of this activity, it was often observed that the C/Ps carried their M/P book with them at all times.
- The training in Japan conducted in October 2013 lasted for two weeks and brought very effective influences to the project. After returning to Maputo from Japan, many of the C/Ps mentioned about the lessons they learned when the strategic plan of SWM was discussed during the review of the M/P. One of the most significant results was that the DMSC established a new section under the Department of Monitoring and Planning that will especially focus on public awareness raising. In July 2013, the C/P proposed the establishment of this new section as one of the objectively verifiable indicators of PDM, but it was still just a casual idea. Then, the C/Ps were so encouraged to know that some municipalities they visited in Japan implemented environmental education well with the independent public awareness section that they came to decide to proceed with the establishment of the new section.
- Major activity in the second project year and third year for the Output 1 was to understand the contents of action plan and its monitoring. Actions designated in the action plan was carefully shared with the C/Ps at the beginning of the second year for their understanding. However, when the action plan was monitored at the first time in September 2014, it was found that the all the actions

were not fully understood among all of the C/Ps because it might be difficult for the C/Ps to catch the actions, even it is designated they are in charge of these, as their actual work. Therefore, some delays or non-starting of actions were observed. Facing this fact, the C/Ps had tried to find out the reasons of these to be recovered as much as possible. These efforts had been continued until the end of the project with the initiative of the head of monitoring and planning department.

- In addition as a remarkable point, the Monitoring and Quality Control Section (RMQC) implemented its activities mostly based on a draft of a specific annual action plan of which was prepared with C/Ps own initiative with the same style of above-mentioned Action Plan for the project. Even though its monitoring was not conducted regularly, it could be said that such challenging attitude to learn and try the new things is desirable.
- C/Ps had made a great and various effort to conduct the waste quality and quantity survey under CMM budget in 2015 as planned in the action plan in order to collect and analyze the data for the basic factors for the M/P. However, as the result, the survey was not conducted. Therefore, we had to adopt the waste quantity and quality data obtained in the first project year onto the revised M/P. It is strongly recommended for DMSC to secure the enough budget to implement these surveys in future, because obtaining the reliable solid waste management data is very essential and crucial to implement such appropriate actions.
- Based on the experiences of preparation and implementation of the action plan during the project period, by using the same format, a new action plan under the revised Master Plan was prepared in the fourth project year with the target year of 2021.
- Construction plan of the new landfill was the quite fundamental factor for DMSC to prepare the revised M/P, though the technical support on this matter is not included in the project activities. Unfortunately, at the time of April 2017, the construction schedule has been delayed due to the difficulties on the resettlement of the residents who are living in the project site. It is expected that all concerned bodies will keep making their effort to clear the site as soon as possible for the smooth commencement of the landfill construction. Understanding the landfill development plan carefully by DMSC/CMM as the user of the site must be indispensable because this regional landfill will be the first experience for both Maputo and Matola to manage jointly.
- At the end of the project activities in April 2017, the C/Ps was expressing their strong wish on the continuous support to follow up on the implementation of the activities under the M/P and its action plan after this JICA project. In principle, activities under the M/P shall be conducted within the capacity of DMSC/CMM which will be expected to be developed through the project. However, further capacity development of CMM/DMSC shall be definitely required, considering the wide range of the solid waste management activities as the public service, such as “joint management of new sanitary landfill with Matola City”, “closure of existing Hulene dumping site”, “preparation for new contract for the urban waste collection in August 2018, and for sub-urban waste collection in June 2017”, “promotion of 3R activities and civic educations” and “appropriate financial management including collection of taxa de limpeza”
- Under the limited project period, we had tried to implement the joint field works such as implementing the pilot projects as much and long as possible to obtain the more reliable data and more variable experiences. In addition, we put longer time to review the current conditions to find out the problem and issues. Strength, Weakness, Opportunity and Threat of these problems were analyzed by C/Ps with the support of JET. Projection of waste quantity generated in future was also took time because we could not implement the second waste quality survey. Therefore, the timing that we started work on the planning part of the M/P, which is Chapter 6 and 7, had to be delayed than the original schedule. Considering these situations and in order to shorten the preparation period of the M/P, Chapter 6 and 7 were mainly drafted by JET but with the occasional discussion with the C/Ps, the draft was reviewed by the C/Ps.

- In February 2017, draft M/P was submitted to DMSC and forwarded to the City Councilors Meeting for their review. One of the reflecting points upon ourselves was that we could not take enough efforts to explain the contents of the draft M/P in detail prior to the City Councilors Meeting. On the other hand, the draft M/P submitted to the concerned for the review was not always reviewed properly. Therefore, some of the comments given were irrelevant and were like complaining about trifles not essential points. One of the comments was why Japanese did not make the presentation of the draft M/P. It means, unfortunately, that DMSC seems still not believed by those officials to have the capability to develop the M/P, regardless of their developed capacity of the C/Ps through the project was clearly proved at the 8th JCC meeting in March 2017 and International Seminar in April 2017, where C/Ps expressed the contents of the draft M/P and project activities by their own words.

3.3 Matters for Output 2

- The Solid Waste Management Department (DGRSU) of the DMSC has the responsible roll of waste collection and transportation. However, this department is functionally designated for the daily operation of waste collection by CMM resources like employees and vehicles, but not organized for the planning of waste collection systems. Therefore, the personnel appointed as the C/Ps from this department was also engaged in planning activities such as designing of the pilot project for collection and transportation, as well as updating and renewing of the M/P. It must be a good opportunity to expand their knowledge and experiences, and to share information among other departments of the DMSC.
- The system used to supervise the performance of the contractor should be reviewed in order to maintain the good performance of the contractors. During the first project year, as seen in the period of temporal contract with the old contractor for urban areas, and the current contract for secondary collection for suburban areas, unsatisfactory performance of contractors may happen while the operation of a new contractor has been going well. Therefore, as the pilot project (P/P) for the improvement of waste collection, establishment of appropriate reporting system on the waste collection problem by using the daily observations by both private contractor and DMSC was introduced.
- Various departments and sections of DMSC and the private contractor were involved in that P/P of waste collection and transportation in urban area. DGRSU was assigned to coordinate between the field teams of waste collection and transportation and management sections for planning and supervising the contract of private company. This is regarded additional responsibility to the ordinary works of DGRSU, then, training was planned and conducted for the concerned personnel. It should be evaluated that they have been able to play required role somehow in the P/P while they faced difficulties in the course of implementation. As experienced in the P/P, appropriate allocation of resources including personnel, equipment and infrastructure are necessary for the improvement of the current situation, as well as improvement of their attitude with understanding the assigned tasks and responsibility. Therefore, it is still important that reallocation of resources and continuous training to improve their capacity according to the certain plan.
- The P/P on source separated collection in Chamanculo D. bairro was implemented with technical support from DMSC and JICA expert team, trying to examine some interventions. Based on the result of the P/P, an introduction of source separation in Maputo was proposed by this M/P. However, it should be understood that it would not be jumping to conclusions to introduce the source separated collection all over the city at once in very short term. Since it is necessary to verify the effectiveness of those interventions in the P/P more in detail, it will be recommended to share the experience and lessons obtained from the P/P to the other bairros and MEs in the suburban area, so as to seek a possibility and strategy to expand source separation practice in Maputo City for mid and long term. One of the lessons learnt from the P/P could be considered that the communication and instruction

to waste generators, residents, in the pilot area was relatively easy because door to door collection method is used for the primary collection. On the other hand, from the view of recyclables collection in the cement city, it is not considered easy to obtain similar result like source separated collection in suburban area through a little modification of the existing collection and transportation system operating with waste containers on the street. Therefore, it was recommended in the revised M/P to propose other appropriate ideas for the recyclable collection in urban area.

- Recent years the DMSC did not renew the equipment such as waste collection vehicle and heavy equipment for both waste collection and waste dumping operation due to difficulty to get approval for the budget allocation from the CMM. Therefore, it causes that the DMSC has to expend for renting these equipment in addition to maintenance cost of superannuated vehicles DMSC owns under the limited budget. It was recommended to conduct the comparison analysis of the cases between replacing the new equipment and continuing the rental equipment. Although all regular collections of domestic wastes are transferred to the responsibility of the contractors, considering the waste collection is the very essential public service, it was also recommended to keep the municipal back-up system.

3.4 Matters for Output 3

- Financial data gathering and analysis are typically demanding as well as terribly monotonous. To counter this, a Finance Team (FT) was established with the C/Ps, local staff, and the international experts. The feeling of belonging to a team encouraged open discussions, equitable work-proportioning with colleagues, and free flow of knowledge sharing. It dispelled the uninteresting atmosphere of merely working for certain targets. It encouraged more innovative ideas. Eventually, the members fondly called the group “Finance” Team to emphasize how work in the otherwise unexciting finance aspect can be enjoyable. Cooperation and collaboration appeared to be easier, despite various limitations and challenges. The work environment proved to be relaxed and motivating, but also effective.
- Data gathering was very challenging. For one, there was a general impression among staff that the office’s financial information was confidential, despite being a public entity. The director’s persistent support and endorsements of the FT to the data sources proved to be necessary. Also, to partially resolve this obstacle, other staff, especially those who were adamant in sharing information, were included in the discussions. This made them feel that they were important contributors to the improvement of the sector, which led to them eventually becoming less hesitant participants. The FT advocated for transparency in records and analysis, and thus shared findings with the directorate. Consequently, solutions and options were proposed, discussed, and decided upon with everyone’s participation.
- There was no uniformity in records. Crucial information that were expected to be annually updated remained outdated. To overcome this, simple financial templates had to be devised and shared. Manual updating of databases with staff was likewise undertaken.
- Regarding the Proof of Service (PdS) database updating and systems upgrading, since it was recognized the low revenue collection efficiency and capacity of the PdS, the JICA expert team and DMSC undertook steps in assessing the old database, and updating it through fieldwork, digitization of new data and re-estimation of waste generation using methodical approach. Several meetings and discussions took place to resolve the issue starting in February 2014 and continues to be implemented during the project.
- Integrity of data is highly necessary to reconcile invoices to collect tipping fees at Hulene dumping site or pay-out large contractors, which was relayed the DMSC. Also, discussions were opened as to the possibility of increasing potential revenue by reviewing contracts of EnviroServ and ECOLIFE,

who at present, are exempted from paying dumping fees but continue to use Hulene. On the other hand, it should be understood, in that case, the tipping fee paid by contractors will be definitely added to the current contract price which are mostly used for the waste collection and transportation.

- JICA expert team, together with C/Ps, observed the budget planning procedures of the DMSC from July to August, 2014. Assessment of the activities undertaken were shared with the directorate in a forum in August at the end of its activity, and best practices elsewhere were likewise shared. According to this activity, improvements in budget planning was conducted by middle of the third project year with joint guidance from JICA expert team and CMM Finance Directorate.
- As for lessons learned, though this is not limited to the activities related output 3 but is generally common to others, more assertive leadership may be necessary, in some cases, when staff are sometimes lax, or showing disregard for work. It is likewise recommended that the Directorate look further closely on the actual performance of staff and current capabilities, so that these would match with the position. It may likewise be necessary to employ new sufficiently-skilled staff who will be eager to work efficiently.
- It is clearly important that people who will be involved in certain activities should have the correct and sufficient information on the objectives and tasks at hand. If someone needs to be substituted in his/her task, the recommended substitute or new person must be fully oriented in the activity, and is fully aware of his/her responsibility and expected output.

3.5 Matters for Output 4

3.5.1 3R Activities

- In this project, it could be said that focusing initially on “Recycle”, which is done after disposing products as waste, among the 3R activities is very challenging but reasonable to contribute in decreasing the volume of solid waste to be treated and managed by DMSC.
- However, since 3R is a relatively new concept in Mozambique and not many related activities had been conducted by municipality until this project commenced, responsibility of promotion of 3R in different levels of CMM, e.g. DMSC, Department of Planning and Monitoring (DPM), different sections, districts and bairros, were still unclear. It meant that 3R activities are still not clearly defined and established as daily undertakings of SWM done by DMSC such as collection, transportation, final dumping of waste and so on. Therefore, at least reconfirmation of specific task assignments to department and section levels (DPM, Quality and control section and Office of Civic Education and Environmental Promotion) under the strong commitment by directorate level were necessary to complete the project 3R activities in efficient and effective manner with ownership by CMM and C/Ps.
- Furthermore, as 3R activities are different from the daily undertakings of DMSC such as waste collection, it was recognized that the technical assistance on 3R was rather challenging to implement and to find compatibility with the daily works. Namely, those who are in charge of 3R in DMSC might feel something difficult to image good enough the actions to be taken for 3R in their daily undertakings of which circumstances might create some confusion among DMSC in the implementation of the activities of the project.
- On the other hand, the two different types of P/Ps, one is the Biodegradable Organic Waste Reduction P/P and another one is the Promotion of valuable recyclables collection P/P, were good opportunities for DMSC to experience practical activities as daily work on 3R as the SWM works. In other words, it could be said that the technical assistance on 3R contributed to leap 3R from conceptual framework to daily work at DMSC.

- Thus, two P/Ps related to promotion of 3R activities implemented under such circumstances were, as well as another P/P for introduction of source separated collection conducted in the second year, the first and quite challenging experiences. Therefore, both C/Ps and JICA experts were really feeling our way around in the dark with everything we did.
- In the P/P for utilization of organic waste, the monitoring and instruction work had been continued about one year in cooperation with UEM, due to the slow speed of waste decomposition in vessels and differences of waste decomposition status by each household who participated in the P/P. With various and precious knowledge and experiences on the production of soil conditioner from the organic waste accumulated at UEM who was also participated in the P/P, it is expected that UEM will be involved in the improvement of solid waste management as an external academic resource. C/Ps of DMSC who also participated in the joint monitoring and workshop with UEM are also expected to take a responsibility on active participation with their initiative for the verification and expansion of the P/P in order to promote the organic waste utilization appropriately in future.
- The P/P for promotion of valuable recyclable collection, what was called “3R Station P/P” in Zimpeto bairro was conducted very experimentally. This P/P aimed to make a trial on the valuable recyclable collection in sub-urban area with involvement of public sector, referring the similar activity in urban area with “Eco Point” usually conducted by NGOs as a kind of social inclusion activity. Although there was some technical support by such NGO to the P/P, it was the first experiences upon the concerned people, then we had faced various issues and unexpected problems from the planning and preparation stages of the P/P. For example, it was necessary for us to confirm the legal validity of the implementation structure of the P/P or necessary procedures on related environmental regulations. With all efforts of C/Ps of DMSC, however, it took too long time to get the confirmation on these matters and some confirmation were done even the implementation period of the P/P.
- These all experiences obtained through the P/P were sorted out during the stage of verification of the P/P and reflected to the discussion on the future possibility of introduction of 3R Station in the revised M/P.
- It could be said that somehow the word of “3R” was definitely infiltrated among the C/Ps when those 3R activities were conducted. On the other hand, as a matter of a fact, understanding of “3R” still remains the conceptual level, not deeply understand the meaning of 3R, “reduce”, “reuse” and “recycle” respectively at this moment. In other words, the current situation of Maputo City and the country of Mozambique itself is still not sufficient for an appropriate opportunity to implement various 3R activities. Actually, one of the comments on the draft of revised M/P given by the City Councilor’s Meeting of CMM held in April 2017, was still that 3R was too early to introduce in Maputo. Efforts on letting these people including citizens understanding the importance and appropriateness of introduction of 3R concept at this stage must be patiently continued.
- There were difficulties in collecting data and information on recyclable waste material flows from relevant stakeholders due to the confidential and internal nature of these data and information, especially prices and clients. Therefore, data collection surveys were carried out with the greatest caution, and it required the careful discussions to get, compile, and disclose such data and information with the stakeholders.
- Considering such circumstances, the workshop on recyclable waste flow was established as a kind of multi-sector forum not only for collecting relevant data and information from stakeholders but also for creating mutual trust between the stakeholders and DMSC for the purpose of promoting waste recycling in Maputo. As the result of periodical 3R workshop, wide network on the resource recycling in Maputo City could be constituted.
- Practice and establishment of 3R activities should not done by only DMSC’s effort, but can be done with the expansion of network more widely to residents, private sectors, neighboring municipalities

and other public organizations such as MITADER, by holding such workshop regularly for the exchange of related 3R information. In addition, introduction of 3R activities should be carefully planned in the mid and long term, considering the current circumstances that is rather early to legally establish the 3R policy.

3.5.2 Civic Education

- First of all, it should be noted that the Office of Civic Education and Environmental Promotion (GECPA), which was established as the result of training in Japan conducted in the first project year, 2013, have taken a big roll on the civic education activities.
- Before the establishment of GECPA, there were two issues for sustaining the civic education campaign in DMSC, namely, 1) monitoring and 2) expenditure for civic education program. The first issue was partly resolved through the analysis of the organizational structure of DMSC and the coordination with the supervision section in the area of monitoring the civic education program. But there were the difficulties on the latter issue, means that the budget for civic education was not explicitly included in the draft 2014 budget plan. However, due to the establishment of GECPA, the both internal budget and external fund related to the civic education were somehow secured.
- However, little while after the establishment of this new office, civic education meetings often stalled during the absence of international JICA experts. In addition, its organizational establishment, their powers and duties were still waiting for an official enactment at that time. Moreover, the regulation on information, education and awareness of residents in the area of SWM system in CMM, which the Ordinance on Cleaning of Urban Solid Waste of CMM is stipulating for a prompt enactment, is still missing. Under this uncertain legal scenario, GECPA should also deal with lack of minimum requirements such as provision of personal computers and connection to the Internet for their daily works, and also for a more comfortable office circumstances with suitable equipment like air conditioner.
- This situation had been improved slowly but surely with the strong leadership of DMSC Director and positive attitude of the GECPA staff to challenge this new activities. In addition, when the JICA expert for the civic education was in Maputo, he/she had tried to sit in the GECPA office together for the joint work as long as possible. As the result of these joint work, the following outcomes were created.
- Strategic Plan of Civic Education in regard of SWM and 3R concepts introduction was developed, aiming to make clear direction of the activities to be conducted by GECPA;
- Coordination with the Section of Monitoring and Quality Control which is the Section of DMSC engaged the civic education duties prior to creation of GECPA was strengthened, on the transference of duties and on the definition of collaboration mechanism among them, especially on those concerned to monitor and evaluate the performance of civic education activities that makes possible to show cause-and-effect feedback relationships;
- Another coordination with the CMM was implemented in order to call for formulating the regulation on information, education and awareness of residents in the area of SWM system of CMM, and to officially establish the powers, duties, and organizational structure of GECPA.
- After the active works under GECPA, significant capacity development was demonstrated by the C/Ps in the third project year in regard of Civic Education duties. Concisely, almost all the project activities, initially coordinated and planned in collaboration between C/Ps and JET, were continued without presence of JET members in Mozambique, having effective progress on every effort. E.g., the completion of the Strategic Plan and 3R Textbook for Students; preparation of educational materials; and, organization of events concerning public awareness rising and educational approaches, were conducted solely by the C/Ps with minor inputs from JET.

- Especially, the collaboration relationship strengthened during the process of formulation of the Strategic Plan was continuing and had been facilitated the decision making for the establishment of a monitoring mechanism requested by GECPA to other divisions of DMSC, such as Sections of Quality Control and Monitoring, Supervision, and Proof of Service pertaining to the Department of Planning and Monitoring, and the Section of Public Collection under the Department of Solid Waste Management. It is not an exaggeration to affirm, that the foremost effective achievement during the third project year concerning Civic Education issues, consisted on the establishment of an inter-division collaboration mechanism for the aforementioned monitoring scheme. This achievement is an outcome of a great steady efforts made by the C/Ps of the Section of Supervision and Public Collection, establishing a recording system consisted on to compile daily situation of waste collection points, identifying anomalous situations; and the common understanding on the necessity for the behavior improvement, by these divisions, jointly with Section of Quality Control and Monitoring.
- Nonetheless of the abovementioned achievements, however, the budget of Year 2016 for GECPA was reduced to less than 10% of previous year due to the influence by increase of expenditures to other prioritized items such as the payment committed to the large contractors who collect the waste from the city, having just for a month equivalent availability for a normal level of Office's activities. DMSC should keep their firm policy on the civic education stipulated in the Strategic Plan and Master Plan with the appropriate budget, without having any unreasonable fluctuation.
- Two Japan Junior Overseas Cooperation Volunteers (JOCV) started their environmental education activity at the GECPA since November, 2015, then one more volunteer joined in February 2017. This should be a very strong support on the promotion of civic education activities of CMM/DMSC. According to the great efforts by DMSC on the improvement of their life infrastructures such as provision of accommodation and commuting transportation, it is expected that these volunteers shall be aggressively in charge of some of activities proposed under the revised M/P.

4. ACHIEVEMENT OF PROJECT PURPOSE

4.1 Mid-term Review

About one and half year has passed since the Project was launched in March 2013. Considering that the Project was to be completed in March 2017, the Mid-term Review was conducted with an aim to review activities and outputs which come up in the Project, and to make recommendations on the activities for the remaining period of the Project.

JICA dispatched Japanese Mid-Term Review team to Maputo from November 12th to November 27th, 2014, for the purpose of conducting the Joint Mid-Term Review with the Mozambican side.

The objectives of the Mid-Term Review were as follows.

- To review the activities of the project and its process of implementation based on the Record of Discussions (R/D).
- To analyze and discuss the achievement of the project in terms of five evaluation criteria (relevance, effectiveness, efficiency, impact and sustainability).
- To identify and recommend measures for solving problems on the project operation to related organizations of Mozambique and Japan based on the results above, and to discuss the activities of the project for the rest of the cooperation period.
- To propose to revise the Project Design Matrix (PDM) and Plan of Operation (PO) based on the results of discussions, if necessary.
- To prepare and agree on the Mid-term Review Report with the Government of Mozambique and to exchange the Minutes of Meetings (M/M).

Mid-Term team consisted of the following members.

Table 4.1 Mid-Term Team Members

Name	Role in the Team / Position and Organization
Mr. Kazunao Shibata	Leader
Mr. Ken Okumura	Cooperation Planning
Mr. Jun Totsukawa	Evaluation Analysis
Mr. Florentino Abilio Gerales Ferreira	City Councilor of Solid Waste Management
Mr. Joao Agostinho Mucavele	Director, Municipal Directory of Urban Solid Waste Management
Ms. Luisa Langa Bila	Coordinator of the Planning and Monitoring Department
Ms. Anchia Bobina	National Fund of Environment (FUNAB)

Source: JICA Expert Team

During the Mid-Term Review, the following points were mainly discussed.

- Consideration for adequate remuneration for the C/Ps staff under the existing laws and regulations.
- Securing the appropriate budget of CMM and DMSC for the project activities.
- Importance of sustainable financial management, especially related to the completion of PROMAPUTO II and public explanation of the raising of cleaning tax.
- CMM/DMSC's leadership in expanding good practices of the SWM obtained thorough the project in other Mozambican cities in collaboration with FUNAB, MICOA, and related institutions.
- Pre-conditions for CMM to achieve the project goal, such as continuations or appropriate change of C/P personnel or efforts for gaining of the public cooperation.

In addition to the above, some indicators in PDM were reviewed and discussed, then revised PDM version 3 was proposed. It was continuously discussed on revising it in the next JCC held June 2015.

4.2 Terminal Evaluation

About three and half years has passed since the Project was launched in March 2013. Considering that the Project was to be completed in March 2017, the Terminal Evaluation was conducted with an aim to review activities and outputs which come up in the Project, and to make recommendations on the activities for the remaining period of the Project.

JICA dispatched Japanese Terminal Evaluation team to Maputo from August 5th to 20th, 2016, for the purpose of conducting the Joint Terminal Evaluation with the Mozambican side.

The objectives of the Terminal Evaluation were as follows.

- To exchange opinions with counterparts in order to assess the present situations, including progress and achievements, according to the project plan;
- To review the progress and the accomplishment of the Project in accordance with the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability);
- To identify obstacles and/or facilitating factors that affected the implementation process;
- To discuss with counterparts the results of review and make recommendations for the remaining period of the Project;
- To draw the lessons learnt from the project implementation;
- To summarize the results of the study in a Joint Terminal Evaluation Report and share this at a Joint Coordination Committee (JCC) meeting in order to contribute to the better understanding of the achievement of the project outcome as well as the measures to be taken to further improve and sustain the Project.

Terminal Evaluation team consisted of the following members.

Table 4.2 Terminal Evaluation Team Members

Name	Role in the Team / Position and Organization
Mr. Daisuke Iijima	Team Leader
Mr. Takaaki Murata	Cooperation Planning
Dr. Makoto Tanaka	Evaluation and Analysis
Mr. João Cipriano	Head of Waste management and Green Spaces, Ministry of Land Environment and Rural Development (National Directorate of Environment)
Mr. Agostinho Fernando	Technician for Waste Management and Green Spaces, Ministry of Land Environment and Rural Development (National Directorate of Environment)

Source: JICA Expert Team

As the result of Terminal Evaluation, the Project was evaluated as below:

- The Project realized a significant improvement in the capacity of CMM in SWM, by making the Project Purpose likely to be achieved within the Project period.
- As for the Outputs, Outputs 1 and 2 have already been achieved, Output 3 is likely to be almost achieved and Output 4 is likely to be achieved.

- As for the five evaluation criteria, the Relevance of the Project is evaluated as high, the Effectiveness, the Efficiency and the Impact relatively high, while the Sustainability is evaluated as relatively low in terms of financial aspects.

Recommendations for the Project by the Terminal Evaluation Team were as below:

- Ensuring the approval of new M/P and guidelines on SWM for Maputo city
- Securing of financial sustainability
- Immediate repair and appropriate management of weigh bridge in Hulene dumping site
- Early and smooth transition to the new sanitary landfill site in Matola city
- The revision of the Indicator 1 of the Overall Goal and its Means of Verification
- Obtaining the baseline Data of the Indicator 3 for the Overall Goal within the project period
- Consideration of the revision of the Indicator 4 for the Overall Goal within the Project Period
- Continuing the Capacity Building Activities among DMSC and Sharing its Experience to CMM and Other Cities
- Estimating SWM Costs after Katembe is Connected to the Mainland with a Bridge

5. RECOMMENDATION FOR THE ACHIEVEMENT OF OVERALL GOAL

At the completion time of the Project, recommendations for achieving overall goal in near future, which is, "The urban environmental and living condition in Maputo City is improved" are summarized as follows. Some of the recommendations are same as those given by the JICA terminal evaluation team in August, 2016.

1) Deep Understanding of the Master Plan and Careful Explanation to the Concerned and Citizens

The Master Plan which was developed by the joint work between Mozambican C/Ps and JICA Expert should be published and widely explained to the concerned people including citizens, after the approval by the CMM. Therefore, the contents of the Master Plan must be carefully read by the CMM staff, especially all the staff of DMSC, for more clear understanding.

When the Master Plan will be publicized, as well as the way for other official document, effective explanation should be conducted with the careful considerations on the determination of target people and appropriate timing. In addition, since this Master Plan will be submitted to MITADER to share the knowledge, it is expected that this experiences will be also utilized as the experiences of the country so that other municipality can refer for their solid waste management.

2) Steady Implementation of Action Plan and Its Monitoring

In order to surely implement the programs proposed in the Master Plan, Action Plan with the target year of 2021, which is the first 5 years of the Master Plan period, was also developed and attached as the annex of the Master Plan. Actions stipulated in the Action Plan must be implemented as proposed by designated person(s), methods and schedule, and its progress should be also monitored. Since this monitoring activity was already experienced during this Project, mainly by the head of Monitoring and Planning Department of DMSC, it is recommended that her monitoring experiences will be shared with other DMSC staff for their own actions.

Especially, as obtaining more reliable waste data is quite crucial for the intermediate minor review of the Master Plan within 5 years, it should be required for DMSC to make an appropriate plan for waste quantity and quality survey or others, and to secure the enough budget.

3) Continuous Improvement of Waste Collection and Transportation

Waste collection and transportation, which is the immediate removal of the waste from its generation sources, is the most fundamental factor of the solid waste management. It is very closely related to maintain the comfortable living environment, but on the other hand, the its cost is relatively so high.

In the Master Plan revised in 2017, it is recommended to continue the current waste collection and transportation system for the moment, which is the waste collection by the compactor trucks from the waste storage containers set on the road in the urban area, and the combination of primary collection from houses to the large container by the microenterprises and secondary transportation of these containers to the final disposal site, together with continuous study for the improvement of waste collection system including the possibility of introduction of the waste transfer station to reduce the waste collection cost.

In addition, in order to establish more efficient waste collection system, it is definitely required to secure the appropriate number of human resources, equipment and budget for the suitable and prompt improvement of problem points or areas, together with the unification of monitoring systems reported by residents or others with MOPA and by DMSC and the contracted waste collection enterprise.

4) Smooth Construction of the New Final Disposal Site and its Suitable Operation

Since the new final disposal site will be the first sanitary landfill in Mozambique, it is very expected that experiences obtained through the construction and operation of the new landfill should be the good practice to proceed the conversion of similar sites at other municipalities in future.

Despite efforts by the various stakeholders to proceed the resettlement of the people who are living in the area for the new final disposal site, it is concerned that the construction schedule might be delayed more. It is very obvious that the existing Hulene dumping site cannot closed without reliable prospects for the commencement of the new landfill operation. In addition, although it could be understandable, at this moment, to concentrate to proceed the resettlement and tendering and implementing of the construction, the operation plan of the new landfill should be prepared as soon as possible. This new site will be operated jointly by Maputo Municipality and Matola Municipality as a regional landfill, but there will be another possibility to take longer time to build the consensus among two municipality because there is no experiences for such joint operation. Without developing the operation plan, it is impossible to estimate the operation cost of the new landfill and to set the unit price of tipping fee to be charged to users. Operation cost of the new sanitary landfill with the daily soil cover, leachate treatment, and gas recovering will be significantly higher than that of current operation of open dumping site which conducts only spreading and leveling the waste disposed of. Therefore, the unit price must be definitely more expensive than the current value and be a big impact to the users.

5) Careful Consideration for Introduction of Intermediate Treatment Facility

Once the operation of the new sanitary landfill will be commenced, the study on the possibility of waste reduction by the intermediate treatment will also become more important from the view of the cost reduction of the solid waste management. However, since there is no experience of planning and operation of such intermediate treatment facility in Mozambique so far as well as the sanitary landfill previously mentioned, careful studies and analysis should be required for its introduction as proposed in the revised Master Plan. Especially in these days, many private companies are continuing to propose such intermediate facilities under PPP (Public-Private-Partnership) scheme as the option that does not require the public investment. However, the contents of these proposal should be very carefully examined. It means that unquestioning approach to introduce such PPP proposal should be avoided.

It is strongly recommended, if necessary, that that feasibility of proposed intermediate treatment facility should be carefully reviewed by the third-party technical authorities.

6) Continuous holding of 3R Forum

One of the outcome of the project was the establishment and regular holding of 3R Forum that is the common meeting ground of the information exchange network to discuss about the introduction of more effective 3R activities. In the revised Master Plan, on the other hand, a phase-in of introduction of 3R activities is recommended because the rapid expansion of 3R activities over the whole municipality in short term is too early. In addition, MITADER is now developing laws and regulations related to 3R.

Based on such trend of 3R related activities, 3R Forum is expected to hold regularly and continuously as it was. Especially, careful comparison, between the cost required for the promotion of 3R activities with the government participation and saving cost of solid waste management due to the reduction of waste generation due to 3R, should be very important to conduct from the view of sustainability of 3R activities.

7) Securing of Financial Sustainability

As recommended in the terminal evaluation report on this project issued in August 2016, securing of financial sustainability must be a subject to be strongly tackled because financial sustainability is also closely connected to the sustainability of solid waste management itself. It must be fully understood that raising the current cleaning tax rate is indispensable due to the commencement of operation of the new sanitary landfill. However, at the same time, efforts on increasing the revenue and reducing the expenditure under

the present financial system should be made for the smooth reviewing of the cleaning tax rate with understanding of residents and businesses, avoiding the illogical raising the rate.

8) Promotion of Inter-Municipal Coordination through ANGER or Others

Establishment of National Solid Waste Manager's Association (ANGER) initiated by the concerned persons of the CMM could be said one of the remarkable outcome of the Project. Therefore, it is expected to utilize ANGER as the opportunity to share the related solid waste management information among municipalities and to promote the mutual technical support. On the other hand, ANGER is still in the dawn of its establishment and requires further efforts to materialize and continue the ANGER activities.

Suitable solid waste management is the common issue among the municipalities. Therefore, understanding of and supporting by the decision maker like the head of local government to ANGER is quite important for the improvement of solid waste management over the whole country with the required strong leadership.

Appendix 1

PDM

Project Design Matrix (PDM)

Project Title: The Project for Promotion of Sustainable 3R Activities in Maputo
Duration of the Project: 4 years
Target Group: Municipal Council of Maputo (CMM) and people living in Maputo City
Target Area: Maputo City (excluding Kalembe and Inhaca)

Version 5.0
Date: 19 August 2016

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal			
The urban environmental and living condition in Maputo City is improved.	1) The number of reports on inadequate waste management (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Residents who understand the definition of 3R and engage 3R activities increases. 5) Satisfaction of citizen for solid waste management is increased.	1) 2) 3) Annual monitoring report of DMSC/CMM, 4) Annual activity report of GECPA/DMSC 5) Annual Social Survey of CMM	
Project Purpose			
Capacity for Solid Waste Management (SWM) in CMM is improved.	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period. 4) Guidelines of SWM for Maputo city are approved by CMM.	1) 4) Minutes of Municipal Council (Approval of M/P) 2) Capacity Assessment sheet 3) Project Report	<ul style="list-style-type: none"> The current policies and laws for SWM in Maputo City will not change drastically. The CMM will secure the enough budget to continue the activities proposed in the Project.
Outputs			
1. Capacity to analyze the current status of SWM in CMM is improved.	1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.	1) Updated M/P 2) Reports of Social survey, waste quantity & composition survey, time & motion survey, current situation survey	<p>The Mozambican counter personnel of the Project will not change their position dramatically during the Project term.</p> <p>Stakeholders will not oppose to the implementation of each Pilot Projects.</p>
2. Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.	1) Project report / annual monitoring report of DMSC 2) Project report / annual monitoring report of DMSC (to measure the number of Bairros to implement recyclable collection). 3) Project report / annual monitoring report of DMSC	
3. Capacity for financial management of SWM in CMM is improved.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported. 3) Annual budget execution rate reaches to 100% ± 15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	1) Financial operation guideline 2) Annual financial report 3) Annual budget planning report 4) Sustainable financial management strategy for SWM sector (to be described in the updated M/P)	
4. 3R activities for reduction of solid waste (including private sector) is introduced in project target area.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary school participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at least 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2 times/year.	1) 2) 3) 4) 5) 6) Project Report / Annual Report of CMM	

Activities	Input	
<p>1-1 Review the existing M/P and identify differences compared to actual situation.</p> <p>1-2 Collect and review latest information and data of waste quantity and composition and final disposal volume.</p> <p>1-3 Update the existing M/P.</p> <p>1-4 Develop an Action Plan for the project period based on the updated M/P.</p> <p>1-5 Develop a guideline of SWM for Maputo City.</p> <p>1-6 Set a target of SWM for post-termination of the Project and develop a draft of M/P.</p> <p>1-7 Develop the Action Plan toward 2021.</p>	<p>1. Japanese Side</p> <p>(a) Dispatch of Experts</p> <ul style="list-style-type: none"> - Chief Advisor / Solid Waste Management - Solid Waste Collection and Transportation - 3R Planning - Environmental Public Awareness Raising / Capacity Development - Financial Management Development <p>(b) Vehicle</p> <p>(c) Equipment and Materials necessary for the Pilot Projects and Public Awareness Raising</p> <p>(d) Counterpart Training in Japan (2-3 counterpart personnel (C/Ps) × twice)</p> <p>2. Mozambican Side</p> <p>(a) Assign of Counterpart Personnel (C/Ps)</p> <p>(b) Facilities and Equipment Necessary for the Project Implementation</p> <p>(c) Office Space for the Japanese Experts</p> <p>(d) Necessary Expenses for the Activities</p> <ul style="list-style-type: none"> - Salaries and Other Allowance for Government Officials - Expenses for Utility such as Electricity, Water Supply, and Gas Fuel - Operational Expenses for Customs Clearance, Storage and Domestic Transportation 	
<p>2-1. Review the situation of waste collection and transportation in Maputo City.</p> <p>2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3.</p> <p>2-5 Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned.</p> <p>2-6. Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5.</p> <p>2-7. Review and feedback the result of the Pilot Project conducted in Activity 2-6.</p> <p>2-8. Develop the Action Plan for improvement of waste collection and transportation.</p>		
<p>3-1. Review and analyze the current financial management of SWM to identify problems.</p> <p>3-2. Collect periodical data on tax-and-spend of wastes every month.</p> <p>3-3. Enter the data and calculate annual budget and monthly expense.</p> <p>3-4. Develop annual financial report.</p> <p>3-5. Develop annual budget planning.</p> <p>3-6. Review the waste service fee.</p> <p>3-7. Develop the Action Plan for improvement of the financial management.</p>		
<p>4-1. Review the current status of recycling activities for recyclable materials (waste papers, glass, metals, and plastics) and organic wastes.</p> <p>4-2. Study possibility for recycling of materials (including cooperation with waste pickers).</p> <p>4-3. Review and improve public awareness raising programs for 3R introduction.</p> <p>4-4. Implement improved programs for 3R introduction.</p> <p>4-5. Develop a plan for a Pilot Project for promotion of recycling activities (cooperation with private sector) based on the results of Activity 4-2.</p> <p>4-6. Implement a Pilot Project for expansion of the recycling activities (cooperation with private sector) based on the result of Activity 4-2.</p> <p>4-7. Review the result of the Pilot Project in Activity 4-6, and develop a plan for promotion of the Pilot Project.</p> <p>4-8. Develop a plan for a Pilot Project for the utilization of organic waste.</p> <p>4-9. Implement the Pilot Project for the utilization of organic waste.</p> <p>4-10. Review the result of the Pilot Project in Activity 4-9, and develop a plan for promotion of organic waste utilization.</p> <p>4-11. Develop the Action Plan for expansion of the Pilot Project for valuables recycling and organic waste utilization.</p>		<p>Pre-Conditions</p> <p>The CMM will secure the enough budget to implement the Project.</p>

*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.

History of revision of PDM

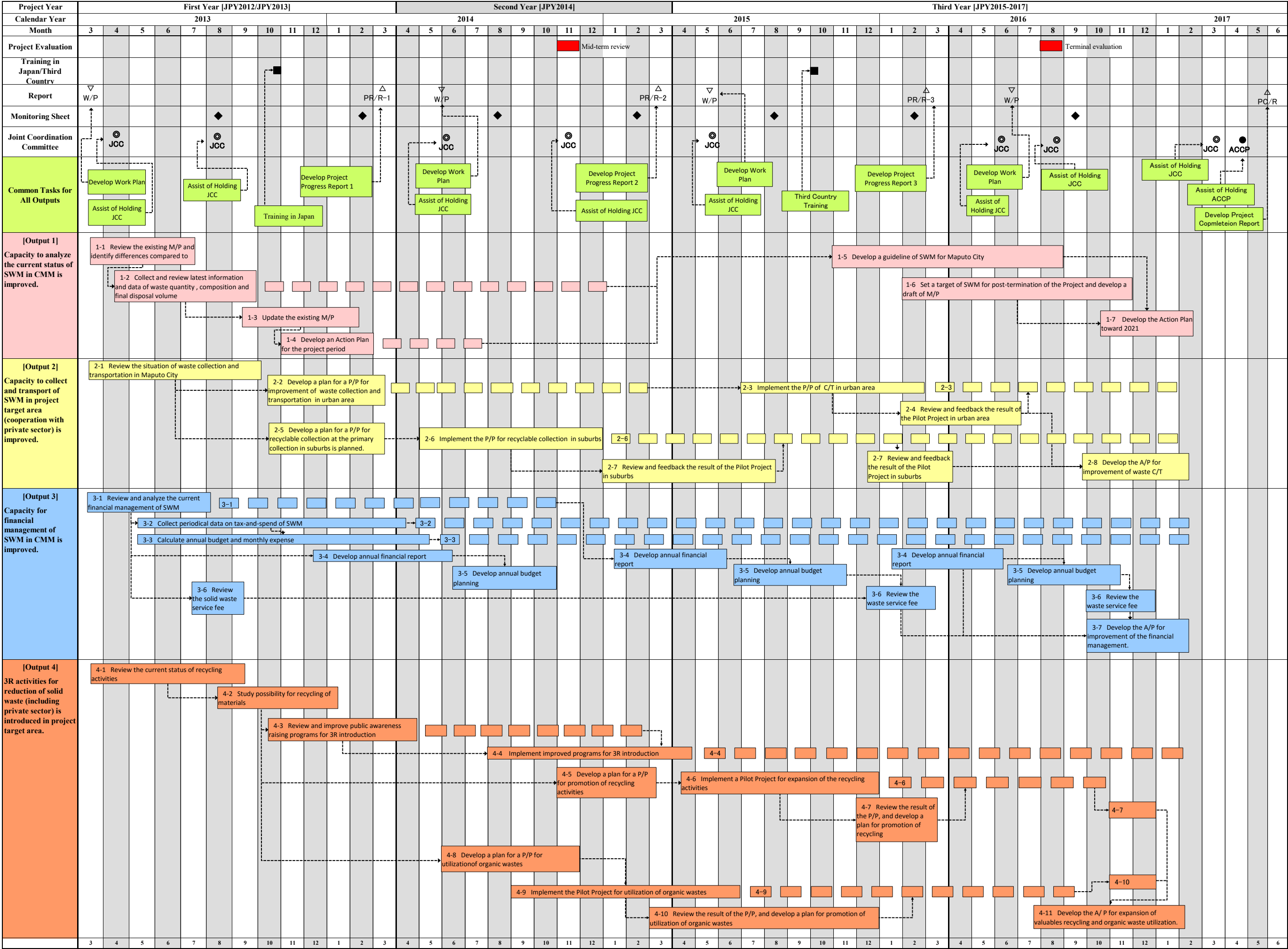
	PDM 1.0 (17 Jul. 2012)	PDM 2.0 (27 Jun. 2014)	PDM 3.0 (27 Nov. 2014)	PDM 4.0 (10 Jun. 2015)	PDM 5.0 (19 Aug. 2016)	PDM 6.0 (23 Mar. 2017)
Overall Goal	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.
Objectively Verifiable Indicators of the overall Goal	1) Amount of inadequate waste disposal is decreased. 2) Amount of final waste disposal per person is decreased.	1) Amount of inadequate waste disposal is decreased. 2) Amount of final waste disposal per person is decreased.	1) Amount of inadequate waste disposal (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2017 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.	1) Amount of inadequate waste Management (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.	1) The number of reports on inadequate waste management (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.	1) The number of reports on inadequate waste management (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Residents who understand the definition of 3R and engage 3R activities increases. 5) Satisfaction of citizen for solid waste management is increased.
			*1 “Inadequate waste management” signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.	*1 “Inadequate waste management” signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.	*1 “Inadequate waste management” signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.	*1 “Inadequate waste management” signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.
Important Assumptions for the Overall Goal	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.
Project Purpose	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.
Objectively Verifiable Indicators of the Project Purpose	1) The M/P for post-termination of the Project is approved by CMM. 2) XX (number) components of 3R system are proposed in Maputo City. 3) A guideline of SWM for Maputo city, a draft of M/P for post-termination of the Project, the Action Plan toward 2021 are developed.	1) The M/P for post-termination of the Project is approved by CMM. 2) XX (number) components of 3R system are proposed in Maputo City. 3) A guideline of SWM for Maputo City, a draft of M/P for post-termination of the Project, the Action Plan toward 2021 are developed.	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Results of capacity assessment achieve at X point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project

	PDM 1.0 (17 Jul. 2012)	PDM 2.0 (27 Jun. 2014)	PDM 3.0 (27 Nov. 2014)	PDM 4.0 (10 Jun. 2015)	PDM 5.0 (19 Aug. 2016)	PDM 6.0 (23 Mar. 2017)
			period. 4) Guidelines of SWM for Maputo city are approved by CMM.	period. 4) Guidelines of SWM for Maputo city are approved by CMM.	period. 4) Guidelines of SWM for Maputo city are approved by CMM.	period. 4) Guidelines of SWM for Maputo city are approved by CMM.
Important Assumptions for the Project Purpose	- The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.	- The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.	- The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.	- The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.	- The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.	- The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.
Output 1	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.
Objectively Verifiable Indicators of Output 1	1) CMM understands progress and differences of the current M/P. 2) CMM understands public perception about SWM.	1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.	1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.	1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.	1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.	1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.
Output 2	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.
Objectively Verifiable Indicators of Output 2	1) Amount of collection and transportation of solid waste is increased by XX%. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to XX (number). 3) Rate of broken container is decreased by XX%. 4) Number of container adequately allocated is increased to XX (number).	1) Amount of collection and transportation of solid waste is increased by XX%. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to XX (number). 3) Rate of broken container is decreased by XX%. 4) Number of container adequately allocated is increased to XX (number).	1) Amount of collection and transportation of solid waste is accurately monitored by CMM and missing data or discrepancy with data reported by the large-scale contractors is less than X% of the total amount. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Number of instructions to large-scale contractors is more than X times. 4) Number of claims regarding waste collection from the residents in Maputo city decreases 20%.	1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.	1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.	1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.
Output 3	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.
Objectively Verifiable Indicators of Output 3	1) Expenditure for SWM in Maputo City is monitored and a budget planning is developed.	2) Financial operation procedure is shared with official document. 3) Revenue baseline data is regularly collected and reported.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported.

	PDM 1.0 (17 Jul. 2012)	PDM 2.0 (27 Jun. 2014)	PDM 3.0 (27 Nov. 2014)	PDM 4.0 (10 Jun. 2015)	PDM 5.0 (19 Aug. 2016)	PDM 6.0 (23 Mar. 2017)
		4) Budget is planned by considering the variance between budget execution and budget plan of the previous year.	3) Annual budget execution rate reaches to 100%±15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	3) Annual budget execution rate reaches to 100%±15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	3) Annual budget execution rate reaches to 100%±15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	3) Annual budget execution rate reaches to 100%±15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.
Output 4	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.
Objectively Verifiable Indicators of Output 4	1) Educational material about 3R is developed. 2) CMM is capable of running public awareness activities routinely. 3) Amount of material recovery in the Pilot Project area is increased by XX%. 4) Amount of compost in the Pilot Project area is increased by XX%.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) Amount of material recovery in the Pilot Project area is increased by XX%. 4) Amount of compost in the Pilot Project area is increased by XX%.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) X (number) schools conduct civic education related 3R. 4) Participation rate of households who conduct segregation of recyclables in the PP area is doubled. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Number of participants from private sector is increased to XX (number).	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary schools participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2times/year.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary schools participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2times/year.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary schools participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2times/year.
Pre-conditions	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.

Appendix 2

Workflow



Note: W/P:Work Plan, PR/R:Project Progress Report, PC/R:Project Completion Report
M/P: Master Plan, A/P: Action Plan, C/T: Collection and transportation, P/P: Pilot project, JCC:Joint coordination committee

Project Work Flow

Appendix 3

Work Plan

República de Moçambique
Direcção Municipal de Salubridade e Cemitérios
Conselho Municipal de Maputo

Projecto para a Promoção de Actividades
Sustentáveis de 3R em Maputo,
República de Moçambique
Plano de Trabalho [Terceiro e Quarto Ano]

Junho de 2015

Agência Japonesa de Cooperação Internacional

Nippon Koei Co., Ltd.



Mapa de Localização da Cidade de Maputo

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1 Resumo do Projecto

1.1 Antecedentes

Seja em países em vias de desenvolvimento ou em países desenvolvidos, todo o mundo trabalha junto na tarefa de gerir o cada vez mais devastador problema de resíduos sólidos que tem acompanhado o desenvolvimento da urbanização.

A situação da Cidade de Maputo, a capital de Moçambique, não é diferente. De acordo com as taxas recentes de crescimento populacional, a quantidade e o tipo de resíduos têm também aumentado. De forma a combater este fenómeno, foi aprovado em 1997 o regulamento sobre a gestão de resíduos sólidos (GRS). Anteriormente, os resíduos sólidos na capital do país eram geridos mas devido a interferência de vários actores tais como organizações não-governamentais (ONGs) e entidades privadas, o sistema não podia manter-se, um sistema apropriado de GRS ainda não tinha emergido.

Devido a este factor, o Conselho Municipal de Maputo (CMM), em colaboração com a Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) (actualmente denominada por Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)), elaborou o “Plano Director de Gestão de Resíduos Sólidos Urbanos no Conselho Municipal de Maputo) (daqui em diante denominado por o P/D)” e trabalhou no sentido de realizar várias melhorias para uma gestão de resíduos abrangente. Contudo, a vulnerabilidade institucional do CMM, especialmente nos aspectos técnicos, obstruía a adopção progressiva da gestão apropriada de resíduos. Consequentemente, o conceito de Reduzir, Reutilizar, Reciclar (3R) proposto no P/D, apesar das práticas existentes de reciclagem, enfrentava vários problemas relacionados com a sua promoção e desenvolvimento.

Sob estas circunstâncias, foi solicitada a cooperação técnica ao governo japonês para a melhoria da GRS em Maputo e para a promoção de actividades de 3R. Em Maio de 2012, após a aceitação deste pedido, a Agência Japonesa de Cooperação Internacional (JICA) realizou uma pesquisa de planificação detalhada e os resultados da pesquisa confirmaram a necessidade de apoiar a melhoria da capacidade do CMM e verificou vários problemas relacionados com a promoção de actividades de 3R. No dia 27 de Novembro de 2012, a JICA chegou a um acordo mútuo com o CMM em relação a concepção do projecto de cooperação técnica e foi assinado o Record of Discussion (R/D).

Com base no R/D, este projecto iniciou em Março de 2013 e a equipa de peritos da JICA foi enviada. Depois do primeiro ano do Projecto, de Março de 2013 a Março de 2014, as actividades do segundo ano do projecto iniciaram em Maio de 2014 e foram concluídas em Março de 2015. Este relatório visa descrever os objectivos do projecto no terceiro e quarto ano do projecto (Abril de 2015 a Fevereiro de 2017).

1.2 Objectivos e Detalhes do Projecto

(1) Objectivo do Projecto

Este projecto pretende executar os resultados esperados para alcançar o objectivo do projecto por meio da implementação das actividades com base no R/D e na Matriz do Desenho do Projecto (PDM) relacionada com o “Projecto para a Promoção de Actividades Sustentáveis de 3R em Maputo, República de Moçambique) ”.

(2) Matriz do Desenho do Projecto (PDM)

A PDM anexa ao R/D pretende alcançar o “Desenvolvimento da Capacidade do CMM para a GRS”, através da melhoria da análise de tarefas do CMM, recolha e transporte e capacidades de gestão financeira em relação a GRS bem como a promoção das actividades de 3R. As mudanças no progresso ou das circunstâncias serão tomadas em consideração e as revisões serão examinadas conforme o necessário.

Com base nas actividades e discussões no segundo ano, foi proposto que a PDM original fosse revista para a versão 4.0 ilustrada na Tabela 1.1. Indicadores da PDM que deverão ser finalizados na reunião do JCC a ser realizada durante o princípio do terceiro e quarto ano do projecto.

(3) Plano de Operações

O Plano de Operações (PO) para o terceiro e quarto ano do projecto encontra-se na Tabela 1.2. O Plano poderá ser confirmado na reunião do JCC a ser realizada no princípio do terceiro ano do projecto. Os planos de operações inicialmente planificados para o terceiro (Abril de 2015 - Março de 2016) e quarto ano do projecto (Abril de 2016 - Março de 2017) foram integrados no plano de operações para o terceiro e quarto ano do projecto (Abril de 2015 - Fevereiro de 2017) devido a mudanças do período do contrato.

(4) Área Alvo

Cidade de Maputo (excluindo Katembe e Kanyaka)

(5) Duração do Projecto

Março de 2013 a Fevereiro de 2017 (47 meses)

(6) Organizações Relevantes

- Agência executora do Projecto: Direcção Municipal DMSC Salubridade e Cemitérios (DMSC), CMM
- Grupos alvo: CMM e os munícipes da Cidade de Maputo
- Órgãos governamentais e entidades privadas relevantes: Outras Direcções do CMM para além da DMSC, Ministério da Terra, Ambiente e Desenvolvimento Rural, ONGs, e entidades privadas.

Tabela 1.1 Matriz de Desenho do Projecto (PDM)

Matrix do projeto (PDM)

Título do Projeto: O Projeto de Promoção de Atividades Sustentáveis 3R em Maputo

Duração do Projeto: 4 anos

Grupo Alvo: Conselho Municipal de Maputo (CMM) e pessoas que vivem em Muputo Cidade

Área Alvo: Maputo Cidade (excluindo Katembe e Kanyaka)

Versão 3.0

Data: 27 de Novembro 2014

Resumo Narrativa	Indicadores objectivamente verificáveis	Meios de Verificação	Pressupostos Importantes
Objetivo geral			
A melhoria das condições ambientais de vida na Cidade de Maputo.	1) Redução da quantidade de deposição inadequada de resíduos(*1). 2) Redução da quantidade de deposição final de resíduos por pessoa. 3) Redução da quantidade de resíduos recicláveis recolhidos. 4) A Taxa de municípios que compreende a definição de 3R e está envolvida em actividades de 3R aumenta de X% em 2016 para X% em 2020 5) O nível de satisfação dos municípios em relação a gestão de resíduos sólidos aumentou.	1), 2) Relatório anual da monitoria da DMSC/CMM, 3),4),5) Inquérito Social Anual do CMM → Os conteúdos claros do relatório deverão ser discutidos durante o projecto	
Objetivo do Projeto			
Melhoria da Capacidade de Gestão de Resíduos Sólidos (GRS) no CMM.	1) O P/D para o período pós-projecto, incluindo os planos para a promoção de actividades sustentáveis de 3R, é aprovado pelo CMM. 2) Pontuação média de capacidades alcançada em pelo menos 3 pontos na escala de avaliação de 5 pontos 3) Foram realizados seminários para a partilha e análise das propostas das Directrizes, do Plano de Acção, e do P/D para o período pós-término do Projecto, entre as autoridades e intervenientes pelo menos 2 vezes durante o período do Projecto. 4) Directrizes da GRS para a Cidade de Maputo aprovadas pelo CMM.	1) Acta do Conselho Municipal (Aprovação do P/D) 2) Ficha de Avaliação de Capacidades 3) Relatório do Projeto	<ul style="list-style-type: none"> As políticas e leis actuais para a GRS na Cidade de Maputo não mudem de forma drástica O CMM vai garantir orçamento suficiente para continuar com as actividades propostas no Projecto

Outputs			
1. Melhoria da Capacidade para analisar o estado actual da GRS no CMM.	1) O CMM compreende o progresso e as diferenças do actual P/D. 2) O CMM compreende a situação actual da GRS	1) P/D Atualizado 2) O relatório da Pesquisa social, pesquisa sobre a quantidade & composição de resíduos, pesquisa sobre tempo & movimento, pesquisa sobre a situação actual	Os funcionários da contra parte Mocambicana a trabalharem no Projecto não vão mudar de cargo, de forma dramática, durante o Projecto. Os intervenientes não se vão opor a implementações dos Projectos Piloto
2. Melhoria da Capacidade de recolha e transporte de GRS na área alvo do projeto (cooperação com o sector privado).	1) Numero de pontos criticos de recolha de residuos e lixeiras informais reduzido em 20% pelo PP, na zona urbana. 2) Numero de Bairros onde a recolha de reciclaveis aumentado para pelo menos um. 3) Relatório de problemas relacionados com a recolha de residuos solidos pelos residentes e provedores de servicos da cidade de Maputo.	1) Relatório do Projecto /relatório de monitoria anual da DMSC 2) Relatório do projecto / relatório anual de monitoria da DMSC (para determinar o número de Bairros que implementam a recolha de material reciclável). 3) Relatório do projecto / relatório de monitoria anual da DMSC	
3. Melhoria da Capacidade para a gestão financeira de GRS no CMM.	1) Procedimentos de operações financeiras são partilhados com documentos oficiais 2) Dados basicos das Receitas e Custos são regularmente recolhidos e reportados 3) A taxa anual de execução orçamental alcança os 100%, $\pm 15\%$ em 2015 e 206. 4) Desenvolvida a estratégia de gestão financeira sustentável para o Sector de GRS.	1) Directriz de operações financeiras 2) Relatório Finacneiro Anual 3) Relatório da Planificação Orçamental Anual 4) Estratégia de gestão financeira sustentável para o sector da GRS (a ser descrita no P/D actualizado)	

4. Introdução de actividades de 3R para a redução de resíduos sólidos (incluindo o sector privado) na área alvo do projeto.	<p>1) Desenvolvimento de Material didático sobre 3R.</p> <p>2) Criado um novo Gabinete para a educação cívica na DMGRSUS.</p> <p>3) X(número) de escolas realizam educação cívica relacionada com 3R</p> <p>4) O numero de agregados participantes que praticam a separação de recicláveis no PP e de pelo menos 30.</p> <p>5) 50% dos agregados que participaram no PP de utilização de resíduos orgânicos continua com a actividade</p> <p>6) Workshops de promoção de 3R na Cidade de Maputo com a participação de instituições privadas e ONGs relevantes realizados pelo menos 2 vezes por ano.</p>	1),2),3),4),5),6) Relatório do Projecto/ Relatório Annual do CMM	
Actividades	Input		
<p>1-1 Revisão do existente M / P e identificar diferenças em comparação com a situação real.</p> <p>1-2 Coletar e analisar as informações e os dados de quantidade de resíduos e composição e volume de disposição final mais recente.</p> <p>1-3 Update M / P. existente</p> <p>1-4 Desenvolver um plano de acção para o período de projeto com base no atualizados M / P.</p> <p>1-5 Desenvolva uma diretriz de GRS para a Cidade de Maputo.</p> <p>1-6 Defina uma meta de GRS para o pós-término do projeto e desenvolver um projecto de M / P.</p> <p>1-7 Desenvolver o Plano de Acção para 2021.</p>	<p>1. Lado japonês</p> <p>(a) Envio de Peritos</p> <ul style="list-style-type: none"> - Chefe da Assessoria / Gestão de Resíduos Sólidos - Recolha e Transporte de Resíduos Sólidos - Planificação de 3R - Sensibilização Pública Ambiental / Desenvolvimento de Capacidades - Desenvolvimento de Gestão Financeira <p>(b) Veículo</p> <p>(c) equipamentos e materiais necessários para os projectos-piloto e Sensibilização Pública</p> <p>(d) Formação da Contraparte no Japão (2-3 membros da contrapartida (C / Ps) × duas vezes)</p>		
<p>2-1. Review the situation of waste collection and transportation in Maputo City.</p> <p>2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3.</p> <p>2-5 Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned.</p> <p>2-6. Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5.</p> <p>2-7. Review and feedback the result of the Pilot Project conducted in Activity 2-6.</p> <p>2-8. Develop the Action Plan for improvement of waste collection and transportation.</p>	<p>2. Lado moçambicano</p> <p>(a) Atribuição do Pessoal da Contraparte (C / Ps)</p> <p>(b) Instalações e Equipamentos necessários para a execução do projeto</p> <p>(c) O espaço de escritórios para os especialistas japoneses</p> <p>(d) Despesas necessárias para as actividades</p> <ul style="list-style-type: none"> - Salários e Outros Abonos para Funcionários Públicos - As despesas de utilidade pública, como eletricidade, abastecimento de água e de gás combustível - Despesas Operacionais para o desembarço aduaneiro, armazenagem e transporte doméstico 		

<p>3-1. Rever e analisar a atual gestão financeira do GRS para identificar problemas.</p> <p>3-2. Coletar dados periódicos sobre imposto e gastar de resíduos todos os meses.</p> <p>3-3. Insira os dados e calcular orçamento anual e despesa mensal.</p> <p>3-4. Desenvolver relatório financeiro anual.</p> <p>3-5. Desenvolver planejamento orçamentário anual.</p> <p>3-6. Reveja a taxa de serviço de resíduos.</p> <p>3-7. Desenvolver o Plano de Acção para a melhoria da gestão financeira.</p>					
<p>4-1 . Reveja o status atual de atividades de reciclagem para os materiais recicláveis (papéis de resíduos, vidro , metais e plásticos) e resíduos orgânicos.</p> <p>4-2. Estudar possibilidade de reciclagem de materiais (incluindo a cooperação com catadores de lixo) .</p> <p>4-3. Rever e melhorar a sensibilização da opinião pública para a introdução de programas 3R .</p> <p>4-4. Implementar programas aperfeiçoados para a introdução 3R .</p> <p>4-5. Desenvolver um plano para um projeto piloto para a promoção de atividades de reciclagem (cooperação com o setor privado) com base nos resultados da Atividade 4-2.</p> <p>4-6 . Implementar um Projeto Piloto para a expansão das atividades de reciclagem (cooperação com o setor privado) com base no resultado da Atividade 4-2.</p> <p>4-7 . Analise o resultado do projeto piloto em atividade 4-6, e desenvolver um plano para a promoção do Projeto Piloto.</p> <p>4-8 . Elaborar um plano para um projeto piloto para a utilização de resíduos orgânicos.</p> <p>4-9 . Implementar o Projeto Piloto para a utilização de resíduos orgânicos .</p> <p>4-10 . Analisar os resultados do projeto piloto em atividade 4-9 , e desenvolver um plano para a promoção da utilização de resíduos orgânicos .</p> <p>4-11 . Desenvolver o Plano de Acção para a expansão do Projeto Piloto de objetos de valor da reciclagem e de utilização de resíduos orgânicos.</p>			<table><tr><th>Pré-condições</th></tr><tr><td>A CMM vai garantir o orçamento suficiente para implementar o projeto.</td></tr></table>	Pré-condições	A CMM vai garantir o orçamento suficiente para implementar o projeto.
Pré-condições					
A CMM vai garantir o orçamento suficiente para implementar o projeto.					

*1 Gestão inadequada de resíduos significa gestão inadequada de contentores, negligência na recolha regular, deposição ilegal, deposição final insalubre

7

(6) Estrutura de Implementação

A estrutura de implementação é composta pelo Comité de Coordenação Conjunta (JCC), funcionários da contraparte do Município de Maputo (C/P) e a Equipa de Peritos da JICA conforme ilustrada na Figura 1.1.

Ao longo deste projecto, está planificado que o JCC realiza sete reuniões para a consulta e tomada de decisão sobre o plano de trabalho anual (proposta), aprovar os indicadores na PDM e reportar sobre a conclusão do projecto. Os membros do JCC estão listados no Apêndice -1 Anexo IV do R/D (Novembro de 2012), e foi confirmado e decidido na primeira reunião do JCC, incluindo a indicação oficial da C/P. Se necessário, durante o período do projecto, esta estrutura de implementação pode ser modificada.

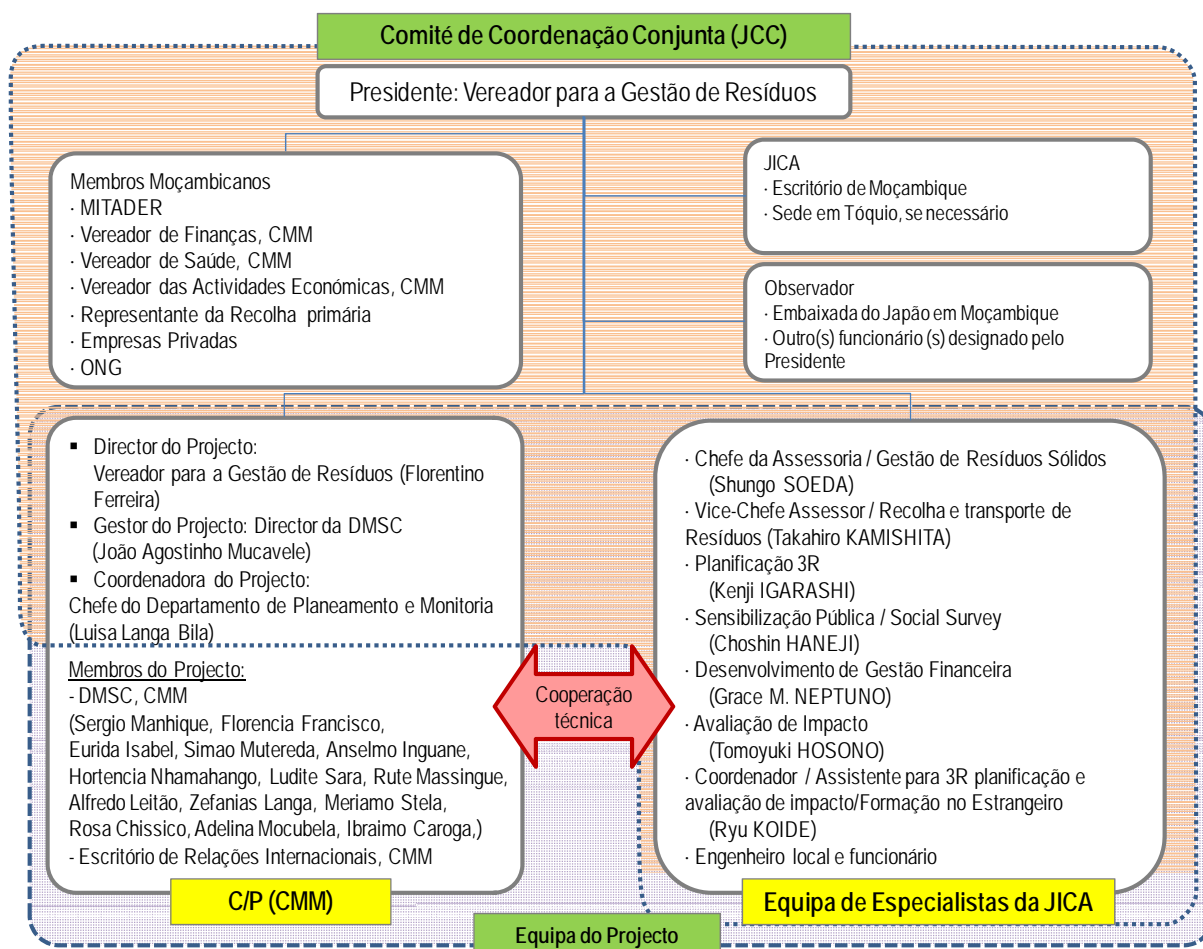


Fig 1.1 Estrutura de Implementação do Projecto

Conforme ilustra a Tabela 1.3, os funcionários da C/P são indicados em função dos grupos de resultados. Cada actividade do projecto será implementada pelos funcionários da C/P e pelos peritos da JICA indicados para cada grupo.

Tabela 1.3 Grupo de Implementação do Projecto


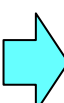



Resultado	Responsabilidade	C/P	In charge of	Perito da JICA
1	Actualização do P/D	Sérgio Manhique Luisa Bila		Shungo Soeda Takahiro Kamishita
2-1	Recolha e transporte (zona urbana)	Meriamo Stela Zefanias Langa Florência Francisco Anselmo Inguane Alfredo Leitão Hortencia Nhamahango		Takahiro Kamishita Choshin Haneji
2-2	Recolha e transporte (zona suburbana)	Meriamo Stela Eurida Isabel Zefanias Langa Anselmo Inguane Alfredo Leitão Hortencia Nhamahango		Takahiro Kamishita Tomoyuki Hosono
3	Gestão financeira	Rosa Chissico Ibraimo Caroga Adelena Mocubela		Grace Neptuno Shungo Soeda
4-1	Planificação de 3R	Sérgio Manhique Meriamo Stela Florência Francisco Eurida Isabel Simao Mutereda Ludite Sara	PP de Ecoponto PP de Ecoponto PP de Resíduos Orgânicos e Outros Educação Cívica	Kenji Igarashi Ryu Koide Kenji Igarashi Shungo Soeda Choshin Haneji Kenji Igarashi
4-2	Educação cívica	Ludite Sara Rute Massingue Alfredo Leitao		Choshin Haneji Kenji Igarashi

2. Plano de Trabalho (Projecto Geral)

2.1 Concepção do Projecto

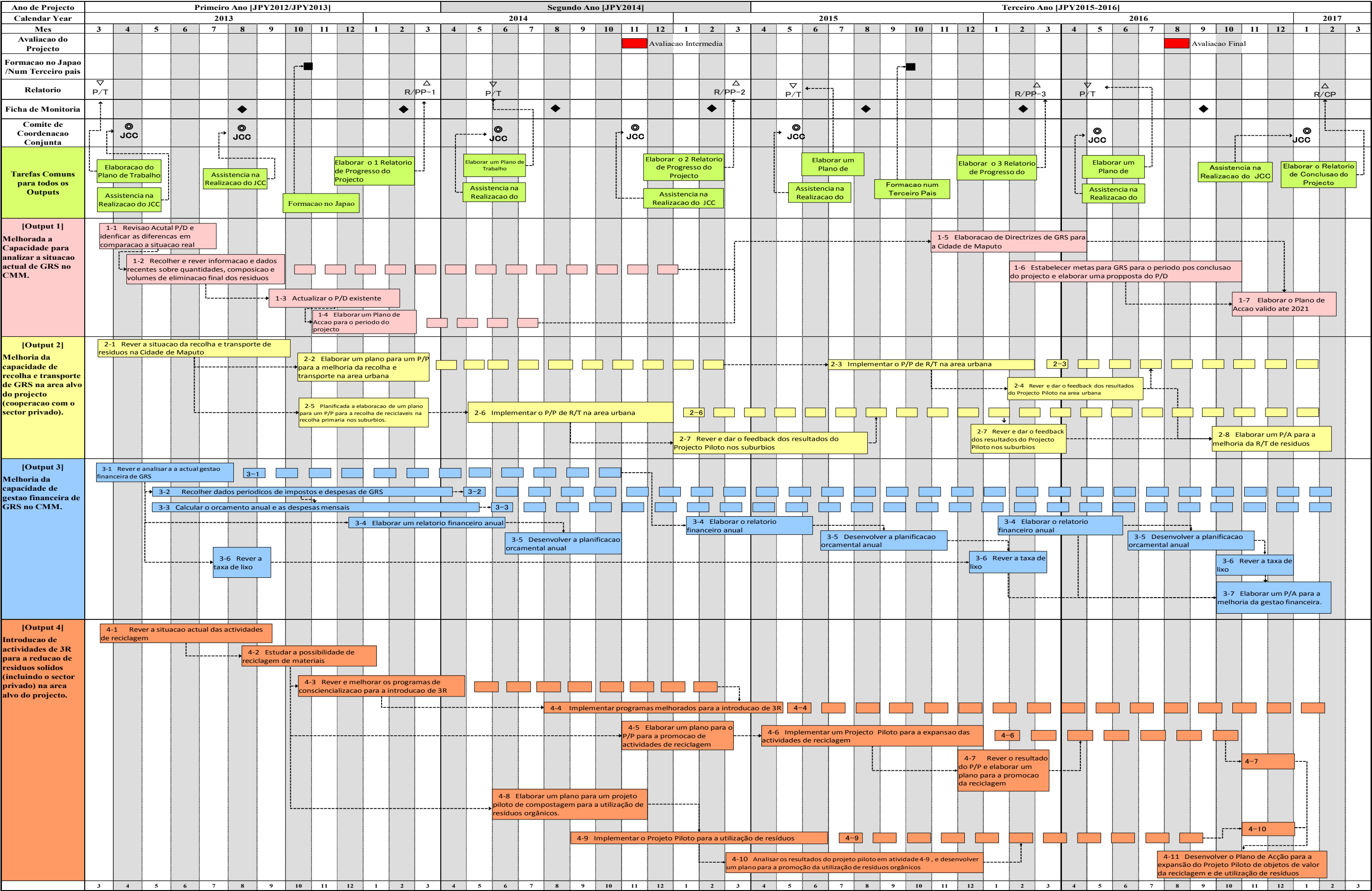
De forma a alcançar os resultados desejados, os pontos de enfoque e as abordagens ao projecto são ilustrados na Tabela 2.1.

Tabela 2.1 Pontos de Enfoque e Abordagens

	Pontos de Enfoque		Abordagens
Resultado 1	Aquisição, por parte da C/P, de habilidades sólidas para a revisão do P/D		Melhoria da análise de tarefas através de experiências, por parte da C/P, juntamente com a execução simultânea da actualização do P/D
Resultado 2	Desenvolvimento de confiança mútua entre o CMM, entidades privadas e os munícipes (produtores de resíduos)		Clarificar as tarefas e responsabilidades dos provedores privados, produtores de resíduos e do CMM, e depois melhorar as capacidades de recolha e transporte através da partilha das melhorias da eficiência da recolha durante o projecto-piloto.
Resultado 3	Estabelecer um método para a recolha e gestão de dados financeiros e planificação e aplicação do orçamento.		Melhorar as capacidades de gestão financeira criando um ciclo apropriado de gestão de dados, planificação, submissão e de relatórios, tomando-se em consideração a futura independência económica da GRS no CMM
Resultado 4	Adquirir uma técnica para a medição da quantidade de material reciclável Implementar um processo conjunto, juntamente com os vários actores, para actividades viradas para 3R		Com a partilha do objectivo de redução da quantidade de resíduos entre os vários actores, a quantidade de material reciclado será monitorada e serão introduzidas actividades de 3R
Aspectos comuns a todos os Resultados	Confirmar a capacidade actual através de avaliações de capacidade. Implementar formações nacionais relacionadas com as necessidades do CMM Gerir tarefas de re-nomeação, desenvolver um sistema prático e sustentável da administração do projecto		O actual nível de capacidade será avaliado, partilhado e melhorado através da participação pró-activa da C/P e formações no Japão e noutro país.

2.2 Fluxo de Trabalho do Projecto

O fluxo de trabalho do projecto é ilustrado na Fig. 2.1



Nota: P/T: Plano de Trabalho, R/PP: Relatorio do Progresso do Projecto, R/ CP: Relatorio da Conclusao do Projecto

Fig. 2.1 Fluxo de Trabalho do Projecto

3 Plano de Trabalho (3º e 4º Ano)

3.1 Actividades para o Resultado 1

(1) Desenvolvimento de directrizes para a GRS para a Cidade de Maputo (Actividade 1-5)

As directrizes para a gestão dos resíduos sólidos, na tabela abaixo, serão conjuntamente desenvolvidas pela C/Ps e pelos peritos da equipa JICA, utilizando os resultados das actividades relacionados com os Resultados 2 a 4. Estas directrizes serão consideradas como informação básica para a elaboração do draft do P/D na actividade 1-6 e constituirão um documento oficial do CMM. As directrizes terão uma utilização prática não somente pelo CMM mas também pelo sector privado e ONGs relacionadas com 3R e a recolha e transporte de resíduos, uma vez enumerarem de forma clara, listas de controlo importantes para cada interveniente.

Tabela 3.1 Directrizes sobre a GRS a serem desenvolvidas durante o Projecto (Proposta)

Nome da Directriz (Proposta)	Conteúdos
• Directriz para a Revisão do P/D para a GRS	Pesquisa sobre a situação actual (pesquisa sobre a quantidade e qualidade dos resíduos, perspectivas futuras), Revisão do P/D e directrizes, Monitoria do plano de acção
• Directriz sobre a Recolha e Transporte GRS	Lista de controlo do equipamento de recolha, Lista de controlo da operação de provedores privados, Plano de formação do CMM, Gestão de contratos
• Directriz sobre a Gestão Financeira para a GRS	Organização das receitas e despesas, Processo de planificação do orçamento, Estimativas do custo unitário para o tratamento de resíduos, Desenvolvimento de um manual para a elaboração do relatório financeiro anual, Plano de formação do CMM
• Directriz para a Introdução de 3R	Considerações para as políticas de promoção de 3R, Considerações sobre as actividades de educação cívica, Explicações aos produtores de resíduos, Plano de formação do CMM.

(2) Estabelecimento de uma meta para a GRS para o período pós-projecto e elaboração do P/D proposta (Actividade 1-6)

Proposta do novo P/D e plano de acção a serem desenvolvidos nas actividades 1-6 e 1-7 serão considerados como sendo um compasso que tornará o CMM capaz de, continuamente, desenvolver as suas próprias capacidades após a conclusão do projecto. Recomenda-se que, se possível, estes documentos sejam aprovados pelo CMM dentro do ano do projecto. Quanto a aspectos técnicos, a equipa de peritos da JICA e os funcionários da C/P farão a revisão e o resumo dos resultados das actividades para os Resultados 2 a 4, de tal forma que a C/P seja capaz de analisar e sugerir que as lições aprendidas sejam incluídas no P/D revisto. Para além das melhorias da capacidade técnica, os pontos importantes ilustrados nas tabelas a seguir serão considerados pela C/P.

Tabela 3.2 Considerações sobre o Desenvolvimento da Proposta do P/D

Item	Considerações
Materialização das políticas de promoção de 3R para a redução dos resíduos (Resultados 2 e 4)	O P/D actual não inclui políticas prioritárias para a promoção de 3R. As políticas prioritárias verificadas pelas actividades do projecto serão incluídas. É necessária a coordenação com as instituições relacionadas de forma a conceber-se as recomendações para as políticas e leis de nível nacional.
Re-avaliação do indicador de monitoria para o P/D	O actual P/D inclui indicadores de monitoria com metas somente até 2010. Os indicadores e metas deverão ser reconsiderados, de forma a terem o horizonte temporal até 2027.
Desenvolvimento de um sistema de retenção de capacidades no CMM	É necessário que o CMM e as instituições relacionadas desenvolvam as suas próprias capacidades através de esforços auto-suficientes. Deverão ser considerados sistemas realísticos, incluindo a utilização de fontes externas como pesquisas e consultores.
Plano financeiro para a melhoria da gestão financeira e actualização do P/D revisto.	Deve-se considerar a melhoria da transparência e eficiência das finanças e do plano fiscal sustentável para o período após o término do apoio do PROMAPUTO, e das fontes de receitas externas se as fontes internas não puderem cobrir todas as despesas

Adicionalmente, o CMM aprovou quatro resoluções relacionadas com o P/D existente aprovado em 2007. Estas resoluções constituem a componente operacional do CMM para a GRS, e providenciam definições de resíduos, actores responsáveis e nível necessário para todo o ciclo de produção de resíduos até a deposição final, valor das taxas dos serviços de limpeza para os municípios e entidades privadas, licenças de controlo das entidades privadas registadas, sistema de contratação das empresas privadas para grandes produtores não domiciliados. Os pontos na tabela a seguir serão discutidos com o CMM visto que a revisão e/ ou suplemento destes regulamentos poderá ser necessário juntamente com a revisão geral do P/D.

Tabela 3.3 Considerações para a Revisão dos Regulamentos do CMM para a GRS e 3R

Perfil da Resolução	Pontos de Revisão
<p>• Resolução No. 86/AM/2008 – Postura de Limpeza de Resíduos Sólidos Urbanos do Município de Maputo</p> <p>Tratamento de resíduos urbanos alvo, definição de resíduos. Encontram-se também nesta resolução os requisitos de recolha, transporte e deposição final. A promoção de 3R e o princípio de poluidor pagador são regulados.</p>	<p>O primeiro objectivo de 3R é a redução da quantidade dos resíduos sólidos municipais a serem manuseados. Portanto, considera-se como sendo necessária a revisão do nome do regulamento ou a elaboração de um novo regulamento sobre a promoção de uma “sociedade orientada para a reciclagem”.</p>
<p>• Resolução No. 87/AM/2008 – Regulamento sobre a Fiscalização das Actividades de Limpeza no Município de Maputo</p> <p>A supervisão e monitoria são definidas como responsabilidades do CMM e da polícia. É estipulada a taxa de limpeza</p>	<p>São consideradas como sendo necessárias a alteração e adição e/ ou revisão relacionada com a supervisão e monitoria da indústria de reciclagem bem como para a promoção de 3R no regulamento.</p>
<p>• Resolução No. 88/AM/2008 – Regulamento sobre a participação do Sector Privado na Limpeza do Município de Maputo</p> <p>São definidas as condições e taxas das licenças das empresas privadas envolvidas nos serviços de limpeza (recolha e transporte). São estipulados os regulamentos sobre a prestação de serviços de recolha a grandes produtores de resíduos, por parte de empresas privadas licenciadas</p>	<p>São consideradas como sendo necessárias a revisão de regulamentos que lidam com o aumento da distância do transporte de resíduos resultante da construção do novo aterro sanitário, bem como das políticas relevantes sobre a promoção de 3R, tais como a promoção da reciclagem e a redução dos resíduos sólidos.</p>
<p>• Resolução No. 89/AM/2008 – Regulamento sobre os Componentes da Limpeza do Município de Maputo</p> <p>São definidos os requisitos, incluindo o equipamento e viaturas, horário de recolha e taxa de recolha de recolha e transporte de resíduos sólidos realizada pelo sector privado. É regulada a taxa dos serviços de recolha por meio de contratos com o CMM.</p>	<p>De forma a promover 3R, considera-se como sendo necessária a revisão de regulamentos relacionados com a introdução da separação dos resíduos bem como a revisão das taxas dos serviços.</p>

(3) Elaboração do Plano de Acção até 2021 (Actividade 1-7)

Com base no P/D revisto, será elaborado o plano de acção após o projecto válido por 5 anos e que terá como meta 2021. As políticas prioritárias definidas no P/D revisto serão materializadas ao nível de trabalho, e o funcionário responsável será indicado. O orçamento e a estrutura de implementação após o projecto também serão claramente descritas.

(4) Continuação da monitoria do Plano de Acção durante o Período do Projecto (Continuação da Actividade 1-4)

O plano de acção elaborado no segundo ano do projecto, conforme ilustrado na Tabela 3.5, será monitorado de forma contínua de quatro em quatro meses (três vezes por ano) pela DMSC. Os peritos da JICA vão providenciar assistência à C/P na avaliação dos resultados da monitoria e para a revisão do plano de acção, se necessário.

Tabela 3.5 Plano de Acção para o Período do Projecto Action

Capítulo do Plano Diretor		As medidas tomadas durante o período do projeto	A6.6-4.1 Criação do metodologias metodologias	Meta a ser alcançada durante o período do Projecto	Departamento/ Repartição Responsável	Funcionário Responsável	Departamentos/ Instituições Relevantes*	Principal Perito de apoio da JET	Despesas Directas da Actividade	Departamento/ Instituição Responsável pelas	Resultado Relacionado e actividades no âmbito	2014/2015				2015/2016				2016/2017			
												I	II	III	IV	I	II	III	IV	I	II	III	IV
												Abr.	Jul.	Out.	Jan.	Abr.	Jul.	Out.	Jan.	Abr.	Jul.	Out.	Jan.
1. Plano Diretor (Resumo e Princípios Básicos do Plano Diretor)	A1-1: Preparar o novo TDR para a atualização do P/D de 2007 através das discussões	Discussão	Novo TDR	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda				Actividade 1-6												
	A1-2: Discutir sobre o conteúdo dos princípios básicos que comparam com o princípio de orientação na Seção 6.1, incluindo o lema e objetivo	Discussão, Workshop	Capítulo 1 do novo P/D	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-6													
	A1-3: Parepreparar o sumário executivo do P / D	Discussão, workshop	Summario do P/D	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-6													
	A1-4: Preparar a directriz de gestão de resíduos sólidos	Discussion, workshop, OJT	Guia de GRS	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-5													
	A1-5: Impressão do novo P/D por parte do CMM	Outsourcing	Novo Livro dp P/D	RMCQ	TBD	Todos os outros departamento de DMGRSUS	(Soeda)	custo de impressã o	DMGRSUS	Depois do Projeto													
	A1-6: Recolha de informação sobre o sistema de GRS em outros países africanos com vista a preparar o plano de visitas, incluído o pedido de orç	Discussão	Plano de Visitas de Campo/ Plano de Orçamento	RMCQ	TBD	Todos os outros departamento de DMGRSUS	(Soeda)	não é necessário	não é necessário	-													
	A1-7: Realização de visitas a países vizinhos	Visita de campo	Relatório da Visita de Campo	RMCQ	TBD	Todos os outros departamento de DMGRSUS	(Soeda)	não é necessário	não é necessário	-													
2. Contexto Jurídico da GRS Urbano	A2-1: Rever o conteúdo detalhado do contexto legal existente	OJT	Capítulo 2 do novo P/D	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-6													
	A2-2: Discutir com o MICOA sobre o estabelecimento de leis e regulamentos nacionais sobre a GRS em Moçambique	discussão	Plano de Acção do MICOA para o estabelecimento de leis	MICOA/LVIA	TBD	DMGRSUS	(Soeda)	não é necessário	não é necessário	não está relacionada													
3. Informações Básicas para GRS urbana	A3-1: Rever as informações básicas sobre a GRS	discussão, OJT	Capitulo 3 do novo P/D	RMCQ	Sergio	Todos os outros departamento de CMM	Soeda	não é necessário	não é necessário	Actividade 1-1, 1-2, 1-6													
4. GRS Actual	A3-1: Rever as informações básicas sobre a GRS																						
4.2 Orçamento e Gestão Financeira	A4.2-1 Elaborar o índice deste capítulo do P/D que seja mais relevante para as situações actuais	Discussão	Novo TDR	Repartição de Finanças	Sítoe/Chissico	nenhum	Neptuno	não é necessário	não é necessário	Actividade 3-1													
	A4.2-2 Determinar operações financeiras atuais	Discussão	Quadro financeiro atual	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-1													
	A4.2-3 Recolher e calcular as receitas e orçamentos mensais e anuais executados	Discussão, OJT	Receitas e orçamentos mensais e anuais	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-2, 3-3, 3-4													
4.8.2 Análise da Posição Financeira	A4.8-1 Elaborar o índice deste capítulo do P/D que seja mais relevante para as situações actuais	Discussão	Novo TDR	Repartição de Finanças	Sítoe/Chissico	nenhum	Neptuno	não é necessário	não é necessário	Actividade 3-1													
	A4.8-2 Observar e Analisar as limitações de operações financeiras atuais	Discussão, OJT	Situação financeira atual	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-3													
	A4.8-2 Observar e Analisar as limitações de operações financeiras atuais	Discussão, OJT	Base para estratégias na melhoria das receitas e custos	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-6													
	Orçamentos A4.8-4 Análises planificadas e executadas	Discussão, OJT	Base para estratégias na melhoria das receitas e custos	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-3													
5. Projecção Futura	A5-1 Realizar a análise detalhada da pesquisa sobre a quantidade e qualidade dos resíduos realizada em 2013	Discussão, OJT	Taxa de geração de resíduos	RMCQ	TBD	nenhum	Kamishita	necessário	não é necessário	Actividade 1-2													
	A5-2 Realizar a pesquisa sobre a quantidade e qualida de de resíduos em 2015	-	Taxa de geração de resíduos	RMCQ	TBD	nenhum	-	não é necessário	DMGRSUS	Actividade 1-2													
	A5-3 Recolher dados adicionais para suplementar a pesquisa sobre a quantidade e qualidade de resíduos realizada em 2013	OJT	Os dados cobrem todos os tipos de resíduos urbanos	RMCQ	TBD	Outras Direcções do CMM Detalhes serão determinados	Kamishita	não é necessário	não é necessário	Actividade 1-6													
	A5-4 Recolher os dados sobre a situação social e económica da Cidade de Maputo	Discussão, OJT	Indicadores Economicos	RMCQ	TBD	Outras Direcções do CMM Detalhes serão determinados	Kamishita, Neptuno	não é necessário	não é necessário	Actividade 1-2, 1-6													
	A5-5 Definir a população e o quadro económico até 2027	OJT	Últimas condições em 2015	RMCQ	TBD	Outras Direcções do CMM Detalhes serão determinados	Kamishita, Neptuno	não é necessário	não é necessário	Actividade 1-6													
	A5-6 Projetar a futura produção de resíduos assente num crescimento económico futuro.	OJT	Projecção (geração de resíduos e redução na fonte)	RMCQ	TBD	nenhum	Kamishita	não é necessário	não é necessário	Actividade 1-6													
6. Planeamento GRS urbano																							
6.1 Princípio orientador	A6.1-1: Desenvolver a imagem gráfica do novo P / D	Discussão, Workshop	Nova imagem gráfica	RMCQ	Sergio	Outras Direcções do CMM Detalhes serão determinados	Soeda	não é necessário	não é necessário	Actividade 1-6													
	A6.1-2: Finalizar o princípio orientador do novo P / D	Discussão, Workshop	Novo princípio básico	RMCQ	Sergio	Outras Direcções do CMM Detalhes serão determinados	Soeda	não é necessário	não é necessário	Actividade 1-6													
6.2 Instituição e Organização		A6.2-1: Elaborar planos para superar questões organizacionais (funcionários motivação, qualificação, salários, não de déficit etc.) Levantadas no P / D.	Discussão, Workshop	Plano de melhoria organizacional	RMCQ	Luisa	Repartição de Recursos Humanos	Soeda, Koide	não é necessário	não é necessário	Actividade 1-6												
		A6.2-2: Identificar vantagens e questões da participação do sector privado e actualizar o P/D	Discussão, Workshop	P/D Atualizado	RMCQ	Luisa	Repartição de Gestão de Resíduos	Soeda, Koide	não é necessário	não é necessário	Actividade 1-6												
6.3 Opções para Remoção de Resíduos	6.3.1 Area Urbana	A6.3.1-1 Analisar a quantidade de resíduos relatado pelo contratante para a área urbana e que a registrada no local de despejo contra o valor estimado do contrato	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-1												
		A6.3.1-2 Identificar os problemas técnicos a serem resolvidos para a melhoria da recolha de resíduos na área urbana	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-1												
		A6.3.1-3 Pensar em medidas para resolver o problema presente na recolha de resíduos e transporte na área urbana	OJT, Discussão	Plano para Projecto Piloto	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessari	não é necessário	Actividade 2-2												
		A6.3.1-4 Preparar um plano para o projeto-piloto para a melhoria da recolha de resíduos e transporte na área urbana	OJT, Discussão	Plano Para Projecto Piloto	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-2												
		A6.3.1-5 Realizar o projeto-piloto para a melhoria da recolha de resíduos e transporte na área urbana	OJT, Discussão	Relatório de execução do projeto-piloto	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-3												
		A6.3.1-6 Avaliar as opções recolha de resíduos para a área urbana	OJT,Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 1-5, Actividade 2-4												
		A6.3.1-7 Fazer a estimativa de custos para o trabalho de subcontratação com o equipamento necessário incluindo contentores e viaturas de recolha de resíduos em relação quantidade futura de recolha de resíduos na zona urbana.	OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 1-5												
		6.3.2 Area Suburbana (Recolha Secundária)	A6.3.2-1 Analisar a quantidade de resíduos relatado pelo contratante para a coleta secundária na área suburbana, que gravou no local de despejo contra o valor estimado do contrato	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-1											
	A6.3.2-2 Identificar os problemas técnicos a serem resolvidos para a melhoria da coleta secundária na área suburbana		OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	-												
	A6.3.2-3 Pensar em medidas para resolver o problema presente na recolha secundário na área suburbana		OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	-												
	A6.3.2-4 Verificar a medida para a melhoria da recolha secundária na área suburbana		OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	-												
	A6.3.2-5 Avaliar as opções recolha de resíduos para a recolha secundária em área suburbana		OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 1-5												

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Abreviaturas: P/D (Plano Diretor), OJT (Formação no local de trabalho), TBD (A ser determinado), TOC (Índice), RMCQ: Reparação de Monitoria e Controle de Qualidade, GECPAF: Gabinete de Educação Cívica, Planejamento Ambiental e Fiscalização

3.2 Actividades para o Resultado 2**(1) Implementação do P/P para a melhoria da recolha e transporte de resíduos em cooperação com o sector privado, na zona urbana (Actividade 2-3)**

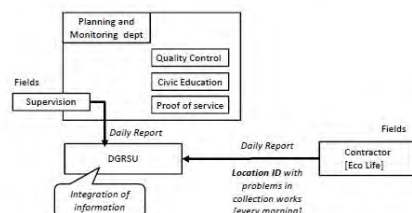
Com base no plano preparado no segundo ano do projecto para o P/P na actividade 2-2, o P/P para a melhoria da recolha e transporte de resíduos sólidos em cooperação com o sector privado na zona urbana será implementado pela DMSC com a assistência da equipa de peritos da JICA. Com a implementação das actividades da tabela a seguir, este P/P vai avaliar as seguintes hipóteses: “O reforço da coordenação entre as repartições e provedores para a utilização da informação existente pode aumentar as acções para a melhoria”

Tabela 3.6 Intervenções a serem aplicadas no projecto-piloto

Intervenção	Acções	Discussões possíveis na actualização do P/D
Integração da informação diária recolhida nos locais de trabalho	Instruir e supervisionar os provedores para facultar informação identificando o contentor com problemas. Integrar e registar a informação diária recolhida pela Repartição de Fiscalização e pelo provedor	Indicação e responsabilidades de cada repartição e provedor. Partilha de informação
Registo e análise de informação Discussão de medidas, incluindo e medidas preventivas	Preparar o relatório semanal que contem a informação diária integrada e partilha do relatório com o DPM e o provedor Identificar os pontos e áreas críticas através da análise da informação acumulada Discutir medidas preventivas para as áreas críticas identificadas	Indicação e responsabilidades de cada repartição e do provedor Procedimentos para a adopção de soluções para o problema
Apoio ao Departamento de GRS em relação as contra-medidas	O Departamento de GRS deve tomar medidas para responder os problemas reportados sob a forma de informação diária	Função do departamento de GRS de colmatar o desempenho inapropriado do provedor e resolver casos de deposição ilegal
Execução de medidas preventivas	Executar as medidas preventivas adoptadas com base na análise da informação integrada do campo de trabalho (por exemplo, actividades de consciencialização, reforço das patrulhas e campanhas públicas)	Indicação e responsabilidades de cada repartição e do provedor Procedimentos para a adopção de soluções para o problema

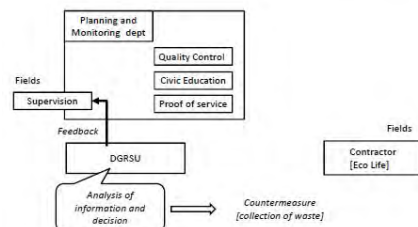
As actividades assumidas e os passos na implementação do P/P são ilustradas na figura abaixo.

(1) Daily reporting and Integration of information



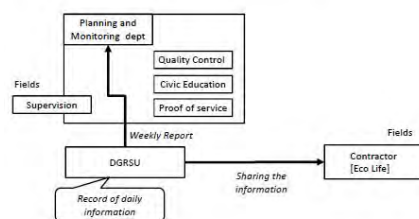
	Section	Role and works
DPM	Quality control	
	Supervision	Daily report to DGRSU and Quality Control
	Civic education	
DGRSU		Integration of information
EcoLife		Daily report to DGRSU

(2) Analysis and decision of countermeasure



	Section	Role and works
DPM	Quality control	
	Supervision	
	Civic education	
DGRSU		Analysis of information of the day Actions to solve the problem in the collection area
EcoLife		Actions to solve the problem in the collection area

(3) Record and report of information and action



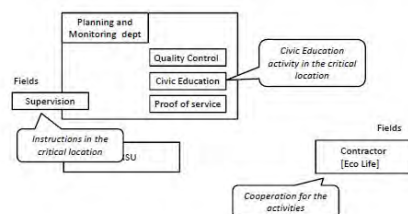
	Section	Role and works
DPM	Quality control	
	Supervision	
	Civic education	
DGRSU		Record of information Preparation of weekly report, which will be shared with DPM and EcoLife
EcoLife		

(4) Analysis of critical location and preventive measures



	Section	Role and works
DPM	Quality control	Analysis of the weekly report to identify critical area Discussion and decision on the preventive measures
	Supervision	Discussion on the preventive measures
	Civic education	
DGRSU		Discussion on the preventive measures
EcoLife		

(5) Implementation of preventive measures



	Section	Role and works
DPM	Quality control	Instructions to relevant sections for preventive measures
	Supervision	Execution of preventive measures (intensive instructions in the critical area)
	Civic education	Execution of preventive measures (community meeting, workshop)
DGRSU		
EcoLife		Supports and participation into events for preventive measures

Figura 3.1 Actividades na implementação do projecto-piloto (Proposta)

O calendário provisório do P/P é ilustrado na figura a seguir. O período de implementação está previsto que se inicie em Junho de 2015 e tenha a duração de 3 meses. Este P/P fará a coordenação, se necessário, com o P/P proposto de monitoria participativa do Banco Mundial que pretende desenvolver um sistema para aceitar e providenciar informação aos munícipes via telefones e internet, para resolver problemas de GRS.

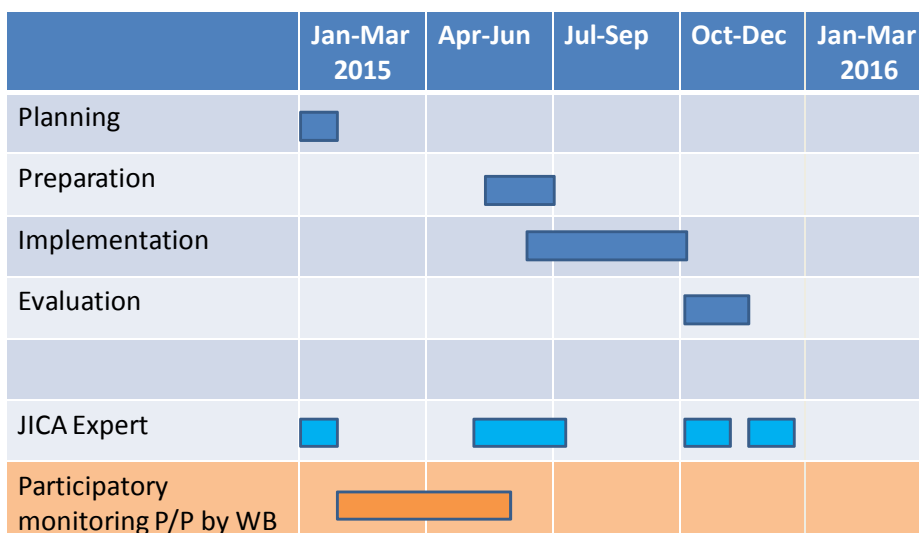


Figura 3.2 Calendário Provisório do projecto-piloto para a recolha e transporte de resíduos na zona urbana

(2) Revisão e retroinformação do resultado do P/P realizado na Actividade 2-3 (Actividade 2-4)

Com base no resultado da implementação do P/P (Actividade 2-3), os resultados da monitoria serão revistos e as hipóteses do P/P serão analisadas. As diferenças entre os resultados esperados e o desempenho real serão avaliadas, e os motivos das diferenças serão examinados. A possibilidade da continuação da intervenção do P/P será decidida pela DMSC tomando em consideração os resultados da análise. Se se decidir pela continuação da intervenção, a equipa de peritos da JICA vai continuar a providenciar aconselhamento em relação às intervenções, incluindo a revisão das estruturas da intervenção.

**(3) Continuação da implementação do P/P para a introdução da recolha de material reciclável na recolha primária de resíduos sólidos na zona suburbana (Actividade 2-6)
Continuação da revisão e retroinformação do resultado do P/P para a recolha de material reciclável na zona suburbana (Actividade 2-7)**

Os resultados do P/P realizado no segundo ano foram resumidos como se segue:

- Quantidade de resíduos recolhidos aumentou gradualmente de 9.3kg/dia em Agosto para 25.7kg/dia em Dezembro; a cooperação por parte dos agregados continua a ser muito limitada, estando abaixo de 10% do total dos agregados.

- As receitas previstas da venda do material reciclável recolhido foram de cerca de 4,000Mt pelos 5 meses. Foi observado, especialmente, um bom desempenho na venda de plástico duro devido às suas quantidades e preço de vendas e foi também observado um alto potencial de redução de resíduos como as garrafas estrangeiras, papelão, plástico mole e latas de alumínio.
- O custo inicial da instalação do P/P foi de cerca de 100,000Mt. Por outro lado, até ao momento não houve nenhum aumento significativo dos custos operacionais para a ME, embora seja necessário analisar-se os custos de transporte & mão-de-obra no futuro.

A revisão do P/P será concluída no terceiro e quarto ano do projecto, tomando-se em consideração os resultados das pesquisas de linha de base e da pesquisa final. A continuação do P/P será determinada pela DMSC com base nos resultados das análises. Se se decidir pela continuação da intervenção, a equipa de peritos da JICA vai continuar a providenciar aconselhamento relacionado com a intervenção, incluindo aconselhamento sobre a revisão das estruturas da intervenção.

(4) Elaboração do plano de acção para a melhoria da recolha e transporte (Actividade 2-8)

Com base nos resultados dos dois P/P (Actividades 2-3 e 2-6), serão elaborados planos de melhoria da recolha e transporte tanto para a zona urbana como para a zona suburbana. Os planos serão materializados ao nível de trabalho, e serão indicados os funcionários responsáveis. Após a conclusão do projecto também serão clarificadas as questões relacionadas com o orçamento e a estrutura de implementação.

3.3 Actividades para o Resultado 3

(1) Recolha de Dados Periódicos sobre as Receitas e Despesas Relacionadas com a Gestão de Resíduos Sólidos (Actividade 3-2) (Continuação do 2º Ano)

A equipa do projecto vai continuar a recolher e a organizar os dados sobre as receitas e despesas da GRS. O modelo comum para o registo de dados financeiros foi apresentado no segundo ano do projecto, para tornar mais curtos os atrasos na partilha de dados, devido à fraca colaboração na partilha de informação. O registo de dados financeiros vai continuar durante o terceiro ano do projecto, de forma a preparar dados básicos para a avaliação do desempenho financeiro da GRS, planificação orçamental e preparação do relatório financeiro anual.

(2) Calcular o orçamento anual e as despesas mensais (Actividade 3-3) (Continuação do 2º Ano)

Os dados recolhidos sobre as receitas e despesas serão continuamente digitalizados para análises posteriores. Os itens necessários para a GRS no orçamento anual e despesas mensais serão identificados e calculados com recurso a base de dados desenvolvida no projecto. A base de dados, que produz um modelo simples que congrega os orçamentos anuais planificados e executados na DMSC, facilita a comparação histórica do desempenho financeiro do sector.

(3) Elaboração do Relatório Financeiro Anual (Actividade 3-4) (Continuação do 2º Ano)

O Relatório Anual não vai apresentar somente os dados financeiros de forma tabular, mas deverá também providenciar análises e explicações sobre como foi o desempenho do sector durante o ano, em termos de finanças. Deverão ser providenciadas algumas análises detalhadas de forma a responder a perguntas tais como “porquê as receitas da taxa da lixeira não são iguais ao total de resíduos depositados na lixeira do Hulene?” ou “que actividades o orçamento para combustível deve cobrir ou apoiar?” De forma a melhorar o seu conteúdo, a proposta do perfil do Relatório Financeiro Anual foi elaborada no segundo ano do projecto. Com base na proposta do perfil, a DMSC vai preparar, com a assistência da equipa de peritos da JICA, um Relatório Financeiro Anual melhorado contendo a segregação das despesas e custos do ano fiscal anterior, com análises e explicações sobre o desempenho financeiro.

(4) Elaboração do relatório de planificação orçamental (Actividade 3-5) (Continuação do 2º Ano)

Com base nos obstáculos e pontos de melhoria para o processo de planificação orçamental observado no segundo ano do projecto, o processo de planificação orçamental contará com a assistência da equipa do projecto da JICA para melhorias adicionais no terceiro e quarto ano do projecto. Os pontos a seguir serão tomados em consideração para o processo:

- De forma a garantir a elaboração de um orçamento bem planificado, a direcção deverá iniciar as actividades de planificação até Junho;
- Será necessária uma boa gestão de tempo para que as sessões de planificação orçamental iniciem a tempo;
- Material de referência para apoiar as actividades e orçamentos propostos, por exemplo, orçamentos anteriores ou despesas actuais, base para as metas das actividades para o ano, cotação de material ou serviços ilustrando as estimativas dos preços de mercado devem ser exibidos durante as sessões de discussão.
- Poderá ser necessário reunir os funcionários e não somente os chefes das repartições ou departamentos, para que surjam melhores perspectivas e opiniões;
- Deve-se considerar uma maior ligação entre investimentos de capital, tais como a aquisição de motorizadas, computadores e aparelhos de ar-condicionado, e as metas de desempenho que o sector deve atingir.

(5) Revisão da Taxa de Limpeza (Actividade 3-6) (Continuação do 2º Ano)

Em reconhecimento dos problemas actuais, a equipa do projecto irá analisar a necessidade de alteração da taxa de lixo e de outras taxas tais como a taxa da lixeira, Taxa dos Contractos, Licença ou remoção especial incluindo o seu sistema de recolha em colaboração com os departamentos relevantes. Se for reconhecido que será possível proceder-se a mudança, o projecto vai providenciar assistência a DMSC e a outras organizações relevantes para tomarem as acções necessárias.

Em termos de recolha da taxa, a EDM será considerada como sendo um bom mecanismo de recolha das receitas de modo eficiente para a DMSC, alcançando os 90%, segundo os seus relatórios. Contudo, informação adicional como o número de consumidores com base nas categorias e no consumo de electricidade deve ser providenciado pela EDM para um melhor controlo das receitas provenientes da taxa de limpeza. Adicionalmente, os resultados e efeitos do aumento da taxa de limpeza em 30% em todos os sectores, anunciado em Dezembro de 2014, deverá ser examinado de modo contínuo.

Adicionalmente, a capacidade da repartição da Prova de Serviço de recolher esta receita dos grandes produtores é, de certa forma, baixa. A equipa de peritos da JICA vai continuar a providenciar assistência na actualização da base de dados dos grandes produtores não domiciliários. Em relação ao sistema de recolha da taxa, serão realizadas pesquisas sobre as preferências e entendimento sobre a recolha da taxa de gestão de resíduos para os grandes produtores não domiciliários neste ano do projecto. Os resultados desta pesquisa serão utilizados para propor métodos de recolha da taxa mais eficientes e eficazes. Está previsto que o tamanho da amostra da pesquisa seja de 120 escritórios, mas os detalhes da pesquisa serão finalizados com base nas discussões entre a equipa de peritos da JICA e a DMSC.

(6) Elaboração do Plano de Acção para a melhoria da gestão financeira (Actividade 3-7)

Com base na recolha e análise de dados sobre as receitas e despesas, elaboração do relatório financeiro anual, planificação do orçamento e revisão da taxa de limpeza (Actividades 3-2, 3-3, 3-4, 3-5, 3-6), o plano de acção para a melhoria da gestão financeira será conjuntamente elaborado pelos funcionários da C/P e a equipa de peritos da JICA. O plano será materializado em documento de trabalho e os técnicos responsáveis serão indicados. O orçamento e a estrutura de implementação após a conclusão do projecto também serão descritos de forma clara.

3.4 Actividades para o Resultado 4

(1) Implementação de programas melhorados para a introdução de 3R (Actividade 4-4) (Continuação do 2º Ano)

Com base no Plano Estratégico para a Educação Cívica relacionada com a GRS e a introdução de conceitos de 3R, preparado no ano anterior do projecto programas melhorados para a introdução de 3R serão implementados de modo contínuo. A introdução dos conceitos de 3R em escolas primárias e secundárias nos Distritos Municipais de Maputo vai continuar, com recurso aos materiais desenvolvidos no ano anterior do projecto: O manual de apoio aos professores para a introdução dos 3R e o kit do “jogo ecológico” para estudantes. Os conceitos de 3R serão inicialmente introduzidos para os professores do ensino básico e secundário por meio de seminários a serem organizados pelo Gabinete de Educação Cívica e Promoção Ambiental. Os professores habilitados através dos seminários poderão solicitar os kits do “jogo ecológico” ao Gabinete de Educação Cívica e Promoção Ambiental com o objectivo de os utilizarem nas suas actividades educacionais.

A proposta inicial do Plano Estratégico de Educação Cívica deve ser revista internamente, nas repartições da DMSC, e consequentemente submetida ao CMM para a sua aprovação. Após isso, serão consideradas actividades de disseminação do conteúdo do manual a nível dos distritos, com foco na introdução dos conceitos dos 3R.

A equipa de peritos da JICA poderá continuar a providenciar assistência na preparação da exposição sobre a Gestão dos Resíduos Sólidos Urbanos no Dia da Cidade. Visto que a DMSC já possui a capacidade para organizar exposições e preparar material através das experiências adquiridas nos anos anteriores do projecto, o apoio por parte da equipa de peritos da JICA será mínimo neste ano do projecto. Simultaneamente, é importante que a Equipa da Educação Cívica faça esforços adicionais em coordenação com os requisitos das actividades dos projectos-piloto em curso com vista a melhorar os impactos previstos e a sustentabilidade da abordagem.

(2) Implementar um P/P para a expansão das actividades de reciclagem (Actividade 4-6)

Com base no conceito de planificação para o P/P para a expansão das actividades de reciclagem (expansão da iniciativa do Ecoponto da zona cimento para as zonas suburbanas) discutido e acordado durante o ano de projecto anterior, o P/P será implementado pela iniciativa da DMSC com a assistência da equipa de peritos da JICA. Abaixo encontram-se descrições e figuras do perfil conceptual do P/P.

1. A DMSC vai promover o P/P e fazer a coordenação entre a ME e o sector privado
2. Uma microempresa (ME) será responsável pela gestão do centro de recuperação;
3. Uma ONG que opera Ecopontos na zona cimento vai providenciar serviços de aconselhamento para a ME em relação a gestão do centro
4. Um centro de recuperação de resíduos recicláveis (similar a um Ecoponto) estabelecido na zona suburbana;
5. O centro de recuperação vai adquirir resíduos recicláveis tais como plástico, nas pessoas que forem a levar tal material ao centro

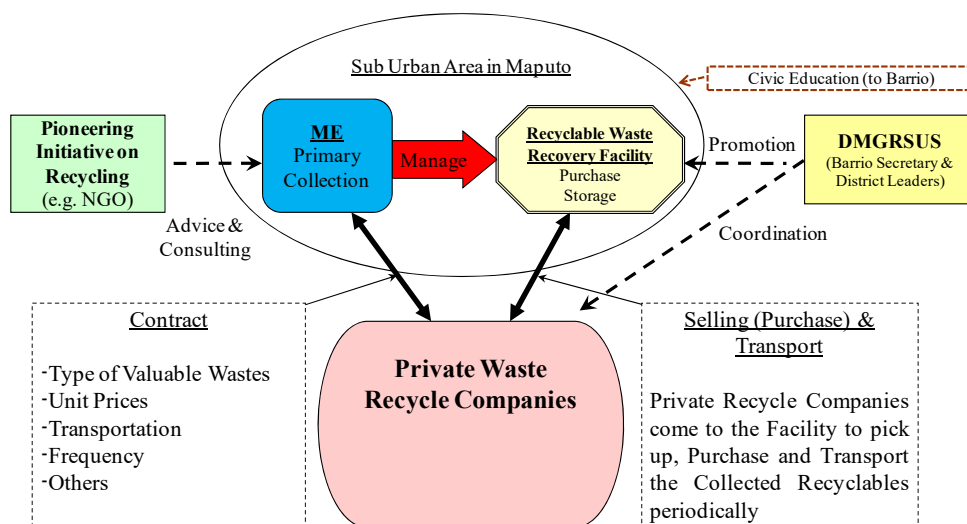


Figura 3.3 Conceito do P/P para a Expansão das Actividades de Reciclagem

No princípio deste ano de projecto, serão seleccionados um local para o estabelecimento do centro de recuperação de resíduos recicláveis e uma microempresa responsável pela operação do P/P, e será estabelecido um local de armazenamento seguro para guardar o material reciclável recolhido.

Em relação a este aspecto, o terreno, orçamento necessário para as campanhas e trabalhadores para o P/P serão providenciados pela DMSC que também fará a revisão das leis e regulamentos relevantes para a implementação do P/P, e indicará o funcionário da C/P responsável pela coordenação, monitoria e supervisão do P/P ao longo do período de implementação.

Adicionalmente, será desenvolvido um relacionamento e mecanismo de colaboração entre a DMSC (CMM), a ONG (que actualmente gere o Ecoponto existente na zona cimento), a Microempresa (que será responsável pela operação na nova instalação como uma nova iniciativa na zona suburbana de Maputo) e empresas de reciclagem (que vão comprar os materiais recolhidos); também será estabelecida uma cadeia de fornecimento e de valor dos materiais recicláveis entre estas entidades.

A proposta do calendário do P/P é ilustrada na figura abaixo:

Item Calendário	2015										2016	
	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez	Jan	Fev	
1. Selecção do local		■	■									
2. Estabelecimento da instalação de armazenamento			■	■								
3. Conclusão da operação detalhada e campanha		■	■	■								
4. Campanha				●								
5. Implementação do P/P				■	■	■	■	■	■	■	■	
6. Avaliação do P/P						▲ Mid			▲ Final			

Figura 3.4 Proposta do Calendário do P/P para a Expansão das Actividades de Reciclagem

(3) Revisão do resultado do P/P, e elaboração do plano para a promoção de reciclagem (Actividade 4-7)

A revisão dos resultados do P/P (Actividade 4-6) (tal como variação da quantidade do material reciclável recolhido e as relações de cooperação entre os actores) bem como análise dos problemas/lições aprendidas durante a implementação do P/P será feita pela DMSC em coordenação com a equipa de peritos da JICA. Com base nos resultados da revisão e análise, será elaborada a proposta do plano de expansão do P/P por iniciativa da DMSC, para o qual a equipa de peritos da JICA vai providenciar o apoio necessário e serão realizadas reuniões. Adicionalmente, a expansão proposta será reflectida no P/P (Actividade 4-6) através do qual o P/P será continuamente implementado por iniciativa da DMSC. De acordo com a última avaliação do P/P realizada através das actividades acima, a equipa de peritos da JICA vai providenciar assistência técnica à DMSC para a formalização da proposta do plano de expansão do P/P para a promoção da reciclagem.

(4) Continuação da revisão dos resultados do P/P, e elaboração do plano para a promoção da utilização de resíduos orgânicos (Actividade 4-10)

Continuação da implementação do P/P para a utilização dos resíduos orgânicos (Actividade 4-9)

O P/P para a utilização de resíduos orgânicos será continuamente monitorado e avaliado durante o presente ano do projecto. Serão realizadas, nomeadamente, visitas periódicas de monitoria aos agregados seleccionados para o P/P, por iniciativa da DMSC (com a participação positiva da C/P) e em cooperação com a UEM. Adicionalmente, está planificada a realização de análises físicas e químicas do condicionador de solo produzido através das técnicas aplicadas pelo P/P, em colaboração com a UEM.

Com base nos resultados da monitoria e avaliação, os desafios e as lições do P/P sobre a utilização de resíduos orgânicos serão analisados pela DMSC em coordenação com a equipa de peritos da JICA, para elaborar um plano de expansão do P/P para a utilização de resíduos orgânicos.

(5) Elaboração de um P/A para a expansão dos P/P para a reciclagem de resíduos e utilização de resíduos orgânicos (Actividade 4-11)
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Com base nos resultados da revisão dos dois P/Ps (Actividade 4-7 e 4-10), serão desenvolvidos planos de expansão de reciclagem de resíduos bem como de utilização de resíduos orgânicos, por iniciativa da DMSC, com a Assistência Técnica da equipa de peritos da JICA.

Durante o período de preparação do plano de expansão acima referido, a experiência obtida através do projecto-piloto de introdução da recolha de recicláveis no Bairro Chamanculo D, onde uma quantidade considerável de garrafas de cerveja estrangeira teve que ser acumulada devido à situação do mercado de reciclagem, será futuramente discutida para encontrar uma solução.

O plano será convertido em instrumento de trabalho e serão indicados os funcionários responsáveis. O orçamento e a estrutura de implementação após o término do projecto também serão claramente descritos.

3.5 Outras Actividades

(1) Preparação e Realização do JCC

A 5ª Reunião do JCC será realizada em Maio ou Junho, para a aprovação do Plano de Trabalho (proposta para o 3º Ano) e concluir os indicadores da PDM (com base na versão 3.0). Subsequentemente, a 6ª Reunião do JCC será realizada aproximadamente em Abril ou Maio de 2016, para a aprovação do Plano de Trabalho (3º Ano: 2) para a finalização das actividades da parte final do terceiro e quarto ano do projecto. Finalmente, a 7ª Reunião do JCC será realizada aproximadamente em Janeiro de 2017 de modo a reportar a situação relacionada com a conclusão do projecto.

(2) Monitoria Semestral

A monitoria das actividades do projecto será realizada em cada semestre, aproximadamente em Agosto de 2015, Fevereiro de 2016 e Agosto de 2016. As fichas de monitoria e o registo das actividades do projecto serão anexados aos relatórios de progresso e final do Projecto.

(3) Avaliação da Capacidade

A avaliação da capacidade em relação à capacidade do CMM para a GRS será realizada conjuntamente, em Fevereiro de 2016 e Janeiro de 2017, pela C/Ps e pela equipa de peritos da JICA. Os resultados serão comparados com os resultados da avaliação da capacidade realizada no primeiro e segundo anos do projecto. A avaliação será composta pelas seguintes três perguntas por cada actividade:

- Resultado da aprendizagem sobre a actividade
- Capacidade humana para a implementação da actividade
- Capacidade organizacional para a sustentabilidade da actividade

(4) Formação no Brasil

A formação no Brasil será realizada aproximadamente em Outubro de 2015 com a participação de cerca de oito membros relevantes da C/P para os resultados 1 a 4. Os objectivos da formação noutro país são os seguintes:

- Transferir para a contraparte moçambicana o conhecimento e experiência de Gestão de Resíduos Sólidos (GRS) no Brasil, como um caso de país lusófono emergente, nos seguintes aspectos:
 - Elaboração de um plano de GRS a nível federal, estadual e municipal
 - Recolha e transporte na zona urbana, incluindo a gestão e monitoria de contractos
 - Gestão Financeira para GRS incluindo planificação orçamental e subsídios,
 - Introdução de actividades de 3R incluindo a compostagem e recolha de recicláveis
- Facilitar a discussão para a revisão do Plano Director para a GRS do lado de moçambicano.

- Facilitar a compreensão sobre a elaboração do plano director, bem como o quadro legal para a GRS e promoção de 3R nos níveis federal, estadual e municipal.
- Facilitar a compreensão do envolvimento de cooperativas de catadores de lixo na GRS.
- Facilitar uma compreensão profunda da formação realizada em 2013 no Japão e projectar actividades em Moçambique, através da comparação entre os três países.

A agenda provisória está descrita na tabela abaixo. A Zona de São Paulo e uma cidade vizinha estão provisoriamente agendadas para serem visitadas, mas os detalhes serão finalizados com base nos resultados da coordenação com o lado brasileiro e discussão com o lado moçambicano.

Tabela 3.7 Agenda Provisória para a Formação no Brasil

Dia	Itinerário	Estadia
1	Partida de Maputo	Em voo
2	Chegada à São Paulo	São Paulo
3	Visita de Cortesia à Cidade de São Paulo, à JICA, e ao Consulado japonês/Moçambicano em São Paulo (se necessário) Orientação sobre o programa de formação	São Paulo
4	Conferência sobre GRS em São Paulo e apresentação sobre a GRS em Maputo Visita ao terreno: Estação de transferência e instalação de separação	São Paulo
5	Conferência sobre Plano Director de GRS elaborado em 2014 Visita ao terreno: Ecoponto de recolha de recicláveis	São Paulo
6	Visita ao Terreno: Aterro sanitário que recebe resíduos da Cidade de SP de outras instalações de GRS tais como tratamento de resíduos perigosos e de desmontagem de resíduos electrónicos	São Paulo
7	Conferência sobre a monitoria ambiental, regulamentos e licenças Visita ao terreno: Actividade de Cooperativas relacionadas com recolha e reciclagem de resíduos	São Paulo
8	Partida para uma cidade da região	Cidade da Região
9	Fim-de-semana	Cidade da Região
10	Conferência sobre o sistema de GRS na Cidade da Região	Cidade da Região
11	Visita ao terreno: Actividades de educação cívica na Cidade da Região Partida à São Paulo	São Paulo
12	Conferência sobre o sistema de GRS na zona suburbana do Grande São Paulo Visita ao terreno: GRS e actividades de reciclagem na zona suburbana do grande são Paulo	São Paulo
13	Conferência sobre políticas de GRS dos governos federais	São Paulo
14	Preparação do relatório e submissão à JICA	São Paulo
15	Partida de São Paulo	Em voo
16	Chegada à Maputo	

4 Relatórios

A equipa do projecto irá elaborar relatórios conforme ilustrado na tabela abaixo e submetê-los à JICA.

Tabela 4.1 Lista de Relatório

Ano	Nome do Relatório	Submissão	Número de Relatórios
Terceiro e Quarto Ano	Plano de Trabalho (3º e 4º ano)	Junho, 2015	<ul style="list-style-type: none"> • 3 cópias em Japonês • 3 cópias em Português • 1 CD-R
	Relatório de Progresso 3	Março, 2016	<ul style="list-style-type: none"> • 3 cópias em Japonês • 3 cópias em Português • 1 CD-R
	Plano de Trabalho (3º e 4º ano: 2)	Junho, 2016	<ul style="list-style-type: none"> • 3 cópias em Japonês • 3 cópias em Português • 1 CD-R
	Relatório de Conclusão do Projecto	Fevereiro, 2017	<ul style="list-style-type: none"> • 3 cópias em Japonês • 3 cópias em Português • 1 CD-R

Tabela 4.2 Itens a serem Reportados (rascunho)

Relatório	Itens a serem reportados	
Relatório de Progresso do Projecto /Relatório de Conclusão do Projecto	a) Linhas gerais do projecto (histórico, cronologia, objectivos) b) Conteúdo das actividades (descrito de acordo com o gráfico de fluxo do projecto) c) Aspectos, esquemas e percepções no decurso da implementação e operação do projecto (metodologia de implementação do projecto, sistema operacional, etc.) d) Nível de realização dos objectivos do projecto (sumário da avaliação interina e final do projecto) e) Sugestões para o alcance dos objectivos gerais. f) Plano de actividade para o próximo período (somente no relatório de progresso)	
	Material em anexo <ul style="list-style-type: none"> • MDP (Última versão, detalhes de transição) • Fluxograma do Projecto • Detalhes do plano de actividades • Histórico de alocação de especialistas (plano do pessoal necessário para o projecto: última versão) • Lista de formandos seleccionados • Lista de provisão do equipamento e equipamentos complementares (incluindo lista de entrega) • Acta da reunião do JCC, etc. • Lista de outras actividades 	Produtos da cooperação técnica em anexo <ul style="list-style-type: none"> • Plano Director Revisto • Plano de Acção válido até 2021 • Directrizes para a Gestão de Resíduos Sólidos (A versão em Inglês e Português serão anexados o progresso ou conclusão relevantes.)

Nota: d), e) e a lista de entrega devem ser feitos apenas para o relatório de conclusão do projecto.

5 Equipamentos Usados nas Operações de Campo

A equipa do projecto usa o equipamento adquirido pela JICA indicado na tabela abaixo para implementar o projecto-piloto. Detalhes sobre equipamento adicional a ser adquirido no terceiro e quarto ano do projecto para o P/P de recolha e transporte serão finalizados respeitando o plano de intervenções do PP.

Tabela 5.1 Equipamento para a Operação de Campo

Ano de Aquisição	Nome do Equipamento	Número de Unidade	Especificações
Primeiro Ano	Máquina Multifuncional Impressora/fotocopiadora	1	Tamanho A3, alimentador automático
	Impressora a Laser	1	Tamanho A4, monocromático
	GPS	3	Garmin eTrek Vista
	Computador Desktop	2	MS Office, Software do Antivírus, UPS
	Laptop	3	MS Office, Software do Antivírus
	Projector	1	Brilho: acima de 2500 lúmens
	Câmara de Vídeo	2	HD Alta definição, prova de água, prova de poeira
	Câmara digital	2	—
Terceiro e Quarto Ano	Laptop [para o P/P]	2	MS Office, Software de Antivírus (para o PP de recolha e transporte)
	Grua [para o P/P]	1	Aluguer por um período de aproximadamente três meses (para o P/P de recolha e transporte)
	Peças para a reparação de veículos de recolha [para o P/P]	1	Para a reparação de um camião da DMSC (para o P/P de recolha e transporte)

6 Compromissos

Para implementar o projecto de forma suave são esperados certos compromissos do lado moçambicano.

O CMM deve desempenhar um maior papel com alto sentido de apropriação no alcance dos objectivos do projecto, enquanto o papel dos especialistas da JICA continuará a ser de apoio.

O CMM apoia aos especialistas da JICA da seguinte maneira.

- Faz todo o esforço para disponibilizar o pessoal necessário e pessoal previamente alocado para desempenharem o papel principal na implementação do projecto.
- Oferece as instalações/equipamento necessários para a implementação do projecto.
- Oferece o espaço do escritório para os especialistas da JICA.
- Cobre os custos necessários do projecto incluindo:
 - Salário e outras ajudas de custo para os funcionários públicos
 - Despesas de serviços de utilidade pública tais como electricidade, abastecimento de água e combustível
 - Custos operacionais de desembaraço aduaneiro, armazenamento e transporte nacional
 - Direitos aduaneiros, impostos internos e outros impostos fiscais que possam ser necessários para o projecto em relação à compra dos produtos e serviços.
- Garante a participação de microempresas, associações e empresas privadas que desempenham o principal papel na recolha e transporte, para o projecto.
- Garante a participação do sector privado e outros intervenientes relevantes tais como LVIA, AMOR etc., que desempenham o principal papel no sistema de 3R.
- Aprova o P/D o mais breve possível por forma a não comprometer o progresso e objectivos do Projecto.
- Toma medidas adequadas para divulgar o projecto na Cidade de Maputo.
- Faz a coordenação necessária com outros doadores.

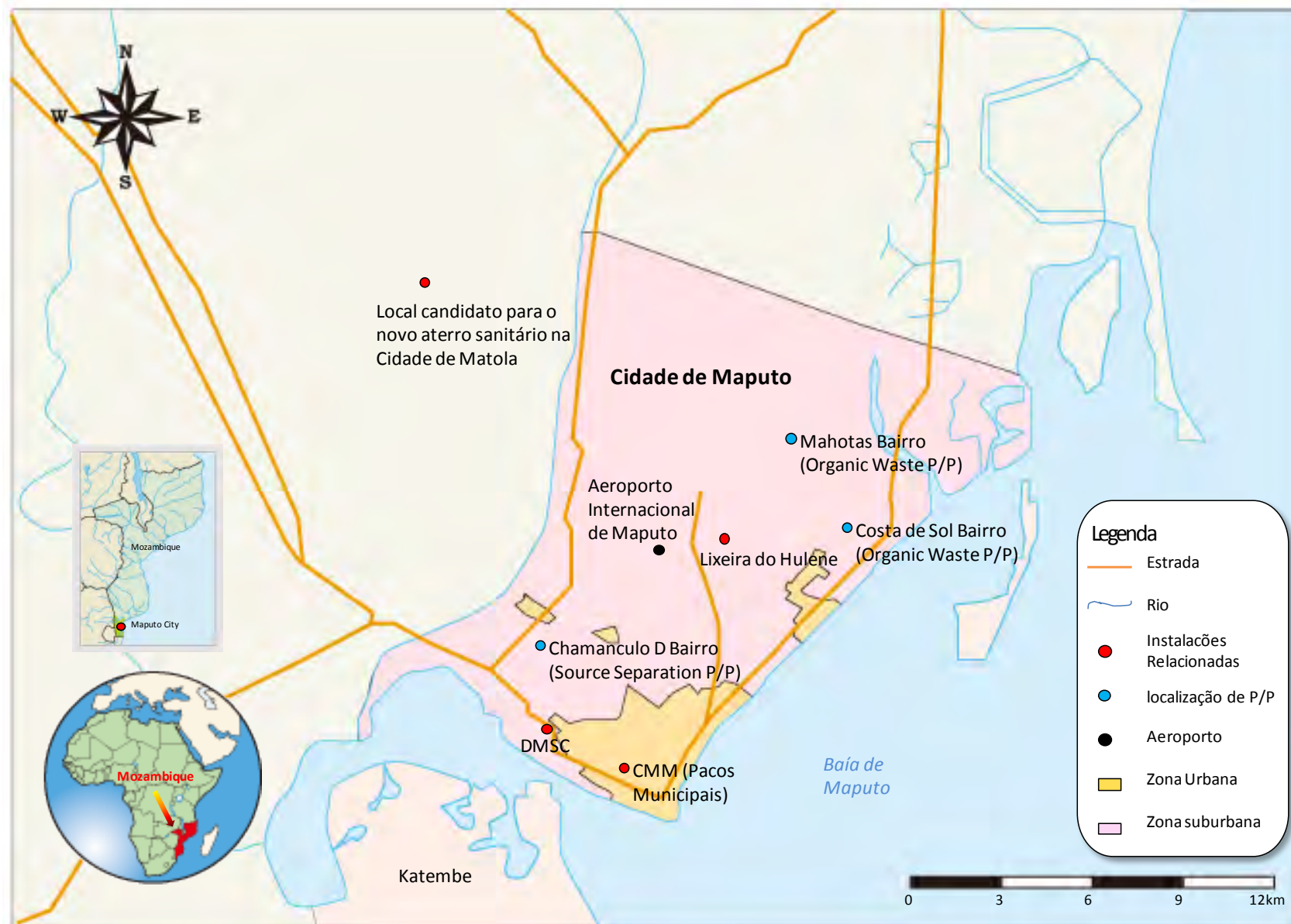
República de Moçambique
Direcção Municipal de Salubridade e Cemitérios
Conselho Municipal de Maputo

Projecto para a Promoção de Actividades
Sustentáveis de 3R em Maputo,
República de Moçambique
Plano de Trabalho [Terceiro e Quarto Ano 2]

Julho de 2016

Agência Japonesa de Cooperação Internacional

Nippon Koei Co., Ltd.



Mapa de Localização da Cidade de Maputo

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Anexo: Record of Discussion [27 de Novembro de 2012]

1 Resumo do Projecto

1.1 Antecedentes

Seja em países em vias de desenvolvimento ou em países desenvolvidos, todo o mundo trabalha junto na tarefa de gerir o cada vez mais devastador problema de resíduos sólidos que tem acompanhado o desenvolvimento da urbanização.

A situação da Cidade de Maputo, a capital de Moçambique, não é diferente. De acordo com as taxas recentes de crescimento populacional, a quantidade e o tipo de resíduos têm também aumentado. De forma a combater este fenómeno, foi aprovado em 1997 o regulamento sobre a gestão de resíduos sólidos (GRS). Anteriormente, os resíduos sólidos na capital do país eram geridos mas devido a interferência de vários actores tais como organizações não-governamentais (ONGs) e entidades privadas, o sistema não podia manter-se, um sistema apropriado de GRS ainda não tinha emergido.

Devido a este factor, o Conselho Municipal de Maputo (CMM), em colaboração com a Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) (actualmente denominada por Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)), elaborou o “Plano Director de Gestão de Resíduos Sólidos Urbanos no Conselho Municipal de Maputo) (daqui em diante denominado por o P/D)” e trabalhou no sentido de realizar várias melhorias para uma gestão de resíduos abrangente. Contudo, a vulnerabilidade institucional do CMM, especialmente nos aspectos técnicos, obstruía a adopção progressiva da gestão apropriada de resíduos. Consequentemente, o conceito de Reduzir, Reutilizar, Reciclar (3R) proposto no P/D, apesar das práticas existentes de reciclagem, enfrentava vários problemas relacionados com a sua promoção e desenvolvimento.

Sob estas circunstâncias, foi solicitada a cooperação técnica ao governo japonês para a melhoria da GRS em Maputo e para a promoção de actividades de 3R. Em Maio de 2012, após a aceitação deste pedido, a Agência Japonesa de Cooperação Internacional (JICA) realizou uma pesquisa de planificação detalhada e os resultados da pesquisa confirmaram a necessidade de apoiar a melhoria da capacidade do CMM e verificou vários problemas relacionados com a promoção de actividades de 3R. No dia 27 de Novembro de 2012, a JICA chegou a um acordo mútuo com o CMM em relação a concepção do projecto de cooperação técnica e foi assinado o Record of Discussion (R/D).

Com base no R/D, este projecto iniciou em Março de 2013 e a equipa de peritos da JICA foi enviada. Depois do primeiro ano do Projecto, de Março de 2013 a Março de 2014, as actividades do segundo ano do projecto iniciaram em Maio de 2014 e foram concluídas em Março de 2015. Portanto o terceiro e quarto ano do projecto foram implementados de forma contínua desde Maio de 2015. O resultado do terceiro ano de actividades foi sumariado sob forma do 3º relatório de progresso em Fevereiro de 2016. Este relatório visa, novamente, descrever os objectivos e actividades do projecto no quarto ano do projecto, último ano do projecto.

1.2 Objectivos e Detalhes do Projecto

(1) Objectivo do Projecto

Este projecto pretende executar os resultados esperados para alcançar o objectivo do projecto por meio da implementação das actividades com base no R/D e na Matriz do Desenho do Projecto (PDM) relacionada com o “Projecto para a Promoção de Actividades Sustentáveis de 3R em Maputo, República de Moçambique) ”.

(2) Matriz do Desenho do Projecto (PDM)

A PDM anexa ao R/D pretende alcançar o “Desenvolvimento da Capacidade do CMM para a GRS”, através da melhoria da análise de tarefas do CMM, recolha e transporte e capacidades de gestão financeira em relação a GRS bem como a promoção das actividades de 3R. As mudanças no progresso ou das circunstâncias serão tomadas em consideração e as revisões serão examinadas conforme o necessário.

Com base nas actividades e discussões havidas nos anos anteriores, foi proposto que a PDM original fosse revista para a versão 4.0 ilustrada na Tabela 1.1.

(3) Plano de Operações

O Plano de Operações (PO) para o terceiro e quarto ano do projecto encontra-se na Tabela 1.2. O Plano poderá ser confirmado na reunião do JCC a ser realizada no princípio do terceiro ano do projecto. Os planos de operações inicialmente planificados para o terceiro (Abril de 2015 - Março de 2016) e quarto ano do projecto (Abril de 2016 - Março de 2017) foram integrados no plano de operações para o terceiro e quarto ano do projecto (Abril de 2015 - Fevereiro de 2017) devido a mudanças do período do contrato.

(4) Área Alvo

Cidade de Maputo (excluindo Katembe e Kanyaka)

(5) Duração do Projecto

Março de 2013 a Fevereiro de 2017 (47 meses)

(6) Organizações Relevantes

- Agência executora do Projecto: Direcção Municipal DMSC Salubridade e Cemitérios (DMSC), CMM
- Grupos alvo: CMM e os municípios da Cidade de Maputo
- Órgãos governamentais e entidades privadas relevantes: Outras Direcções do CMM para além da DMSC, Ministério da Terra, Ambiente e Desenvolvimento Rural, ONGs, e entidades privadas.

Tabela 1.1 Matriz de Desenho do Projecto (PDM)

Matrix do projeto (PDM)

Título do Projeto: O Projeto de Promoção de Atividades Sustentáveis 3R em Maputo

Duração do Projeto: 4 anos

Grupo Alvo: Conselho Municipal de Maputo (CMM) e pessoas que vivem em Maputo Cidade

Área Alvo: Maputo Cidade (excluindo Katembe e Kanyaka)

Versão 4.0

Data: Junho 2015

Resumo Narrativa	Indicadores objectivamente verificáveis	Meios de Verificação	Pressupostos Importantes
Objetivo geral			
A melhoria das condições ambientais de vida na Cidade de Maputo.	1) Redução da quantidade de deposição inadequada de resíduos(*1). 2) Redução da quantidade de deposição final de resíduos por pessoa. 3) Redução da quantidade de resíduos recicláveis recolhidos. 4) A Taxa de municípios que compreende a definição de 3R e está envolvida em actividades de 3R aumenta de X% em 2016 para X% em 2020 5) O nível de satisfação dos municípios em relação a gestão de resíduos sólidos aumentou.	1), 2) Relatório anual da monitoria da DMSC/CMM, 3),4),5) Inquerito Social Anual do CMM <i>→ Os conteúdos claros do relatório deverao ser discutidos durante o projecto</i>	
Objetivo do Projeto			
Melhoria da Capacidade de Gestão de Resíduos Sólidos (GRS) no CMM.	1) O P/D para o período pós-projecto, incluindo os planos para a promoção de actividades sustentáveis de 3R, é aprovado pelo CMM. 2) Pontuação média de capacidades alcançada em pelo menos 3 pontos na escala de avaliação de 5 pontos 3) Foram realizados seminários para a partilha e análise das propostas das Directrizes, do Plano de Acção, e do P/D para o período pós-término do Projecto, entre as autoridades e intervenientes pelo menos 2 vezes durante o período do Projecto. 4) Directrizes da GRS para a Cidade de Maputo aprovadas pelo CMM.	1) Acta do Conselho Municipal (Aprovação do P/D) 2) Ficha de Avaliação de Capacidades 3) Relatório do Projeto	<ul style="list-style-type: none"> As políticas e leis actuais para a GRS na Cidade de Maputo não mudem de forma drástica O CMM vai garantir orçamento suficiente para continuar com as actividades propostas no Projecto

Outputs			
1. Melhoria da Capacidade para analisar o estado actual da GRS no CMM.	1) O CMM compreende o progresso e as diferenças do actual P/D. 2) O CMM compreende a situação actual da GRS	1) P/D Atualizado 2) O relatório da Pesquisa social, pesquisa sobre a quantidade & composição de resíduos, pesquisa sobre tempo & movimento, pesquisa sobre a situação actual	Os funcionários da contra parte Mocambicana a trabalharem no Projecto não vão mudar de cargo, de forma dramática, durante o Projecto. Os intervenientes não se vão opor a implementações dos Projectos Piloto
2. Melhoria da Capacidade de recolha e transporte de GRS na área alvo do projeto (cooperação com o sector privado).	1) Numero de pontos criticos de recolha de residuos e lixeiras informais reduzido em 20% pelo PP, na zona urbana. 2) Numero de Bairros onde a recolha de reciclaveis aumentado para pelo menos um. 3) Relatório de problemas relacionados com a recolha de residuos solidos pelos residentes e provedores de servicos da cidade de Maputo.	1) Relatório do Projecto /relatório de monitoria anual da DMSC 2) Relatório do projecto / relatório anual de monitoria da DMSC (para determinar o número de Bairros que implementam a recolha de material reciclável). 3) Relatório do projecto / relatório de monitoria anual da DMSC	
3. Melhoria da Capacidade para a gestão financeira de GRS no CMM.	1) Procedimentos de operações financeiras são partilhados com documentos oficiais 2) Dados basicos das Receitas e Custos são regularmente recolhidos e reportados 3) A taxa anual de execução orçamental alcança os 100%, $\pm 15\%$ em 2015 e 2016. 4) Desenvolvida a estratégia de gestão financeira sustentável para o Sector de GRS.	1) Directriz de operações financeiras 2) Relatório Finacneiro Anual 3) Relatório da Planificação Orçamental Anual 4) Estratégia de gestão financeira sustentável para o sector da GRS (a ser descrita no P/D actualizado)	

4. Introdução de actividades de 3R para a redução de resíduos sólidos (incluindo o sector privado) na área alvo do projeto.	<p>1) Desenvolvimento de Material didático sobre 3R.</p> <p>2) Criado um novo Gabinete para a educação cívica na DMGRSUS.</p> <p>3) 31 (número) de escolas realizam educação cívica relacionada com 3R</p> <p>4) O numero de agregados participantes que praticam a separacao de reciclaveis no PP e de pelo menos 30.</p> <p>5) 50% dos agregados que participaram no PP de utilização de resíduos organicos continua com a actividade</p> <p>6) Workshops de promocao de 3R na Cidade de Maputo com a participacao de instituicoes privadas e ONGs relevantes realizados pelo menos 2 vezes por ano.</p>	1),2),3),4),5),6) Relatório do Projecto/ Relatório Annual do CMM	
Actividades	Input		
<p>1-1 Revisão do existente M / P e identificar diferenças em comparação com a situação real.</p> <p>1-2 Coletar e analisar as informações e os dados de quantidade de resíduos e composição e volume de disposição final mais recente.</p> <p>1-3 Update M / P. existente</p> <p>1-4 Desenvolver um plano de acção para o período de projeto com base no atualizados M / P.</p> <p>1-5 Desenvolva uma diretriz de GRS para a Cidade de Maputo.</p> <p>1-6 Defina uma meta de GRS para o pós-término do projeto e desenvolver um projecto de M / P.</p> <p>1-7 Desenvolver o Plano de Acção para 2021.</p>	<p>1. Lado japonês</p> <p>(a) Envio de Peritos</p> <ul style="list-style-type: none"> - Chefe da Assessoria / Gestão de Resíduos Sólidos - Recolha e Transporte de Resíduos Sólidos - Planificacao de 3R - Sensibilização Pública Ambiental / Desenvolvimento de Capacidades - Desenvolvimento de Gestão Financeira <p>(b) Veiculo</p> <p>(c) equipamentos e materiais necessários para os projectos-piloto e Sensibilização Pública</p> <p>(d) Formação da Contraparte no Japão (2-3 membros da contrapartida (C / Ps) × duas vezes)</p>		
<p>2-1. Review the situation of waste collection and transportation in Maputo City.</p> <p>2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3.</p> <p>2-5 Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned.</p> <p>2-6. Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5.</p> <p>2-7. Review and feedback the result of the Pilot Project conducted in Activity 2-6.</p> <p>2-8. Develop the Action Plan for improvement of waste collection and transportation.</p>	<p>2. Lado moçambicano</p> <p>(a) Atribuicao do Pessoal da Contraparte (C / Ps)</p> <p>(b) Instalações e Equipamentos necessários para a execução do projeto</p> <p>(c) O espaço de escritórios para os especialistas japoneses</p> <p>(d) Despesas necessárias para as actividades</p> <ul style="list-style-type: none"> - Salários e Outros Abonos para Funcionários Públicos - As despesas de utilidade pública, como eletricidade, abastecimento de água e de gás combustível - Despesas Operacionais para o desembaraço aduaneiro, armazenagem e transporte doméstico 		

<p>3-1. Rever e analisar a atual gestão financeira do GRS para identificar problemas.</p> <p>3-2. Coletar dados periódicos sobre imposto e gastar de resíduos todos os meses.</p> <p>3-3. Insira os dados e calcular orçamento anual e despesa mensal.</p> <p>3-4. Desenvolver relatório financeiro anual.</p> <p>3-5. Desenvolver planejamento orçamentário anual.</p> <p>3-6. Reveja a taxa de serviço de resíduos.</p> <p>3-7. Desenvolver o Plano de Ação para a melhoria da gestão financeira.</p>					
<p>4-1 . Reveja o status atual de atividades de reciclagem para os materiais recicláveis (papéis de resíduos, vidro , metais e plásticos) e resíduos orgânicos.</p> <p>4-2. Estudar possibilidade de reciclagem de materiais (incluindo a cooperação com catadores de lixo) .</p> <p>4-3. Rever e melhorar a sensibilização da opinião pública para a introdução de programas 3R .</p> <p>4-4. Implementar programas aperfeiçoados para a introdução 3R .</p> <p>4-5. Desenvolver um plano para um projeto piloto para a promoção de atividades de reciclagem (cooperação com o setor privado) com base nos resultados da Atividade 4-2.</p> <p>4-6 . Implementar um Projeto Piloto para a expansão das atividades de reciclagem (cooperação com o setor privado) com base no resultado da Atividade 4-2.</p> <p>4-7 . Analise o resultado do projeto piloto em atividade 4-6, e desenvolver um plano para a promoção do Projeto Piloto.</p> <p>4-8 . Elaborar um plano para um projeto piloto para a utilização de resíduos orgânicos.</p> <p>4-9 . Implementar o Projeto Piloto para a utilização de resíduos orgânicos .</p> <p>4-10 . Analisar os resultados do projeto piloto em atividade 4-9 , e desenvolver um plano para a promoção da utilização de resíduos orgânicos .</p> <p>4-11 . Desenvolver o Plano de Ação para a expansão do Projeto Piloto de objetos de valor da reciclagem e de utilização de resíduos orgânicos.</p>			<table><tr><th>Pré-condições</th></tr><tr><td>A CMM vai garantir o orçamento suficiente para implementar o projeto.</td></tr></table>	Pré-condições	A CMM vai garantir o orçamento suficiente para implementar o projeto.
Pré-condições					
A CMM vai garantir o orçamento suficiente para implementar o projeto.					

*1 Gestão inadequada de resíduos significa gestão inadequada de contentores, negligência na recolha regular, deposição ilegal, deposição final insalubre

7

(6) Estrutura de Implementação

A estrutura de implementação é composta pelo Comité de Coordenação Conjunta (JCC), funcionários da contraparte do Município de Maputo (C/P) e a Equipa de Peritos da JICA conforme ilustrado na Figura 1.1.

Ao longo deste projecto, está planificado que o JCC realize sete reuniões para a consulta e tomada de decisão sobre o plano de trabalho anual (proposta), aprovar os indicadores na PDM e reportar sobre a conclusão do projecto. Os membros do JCC estão listados no Apêndice -1 Anexo IV do R/D (Novembro de 2012), e foi confirmado e decidido na primeira reunião do JCC, incluindo a indicação oficial da C/P. Se necessário, durante o período do projecto, esta estrutura de implementação pode ser modificada.

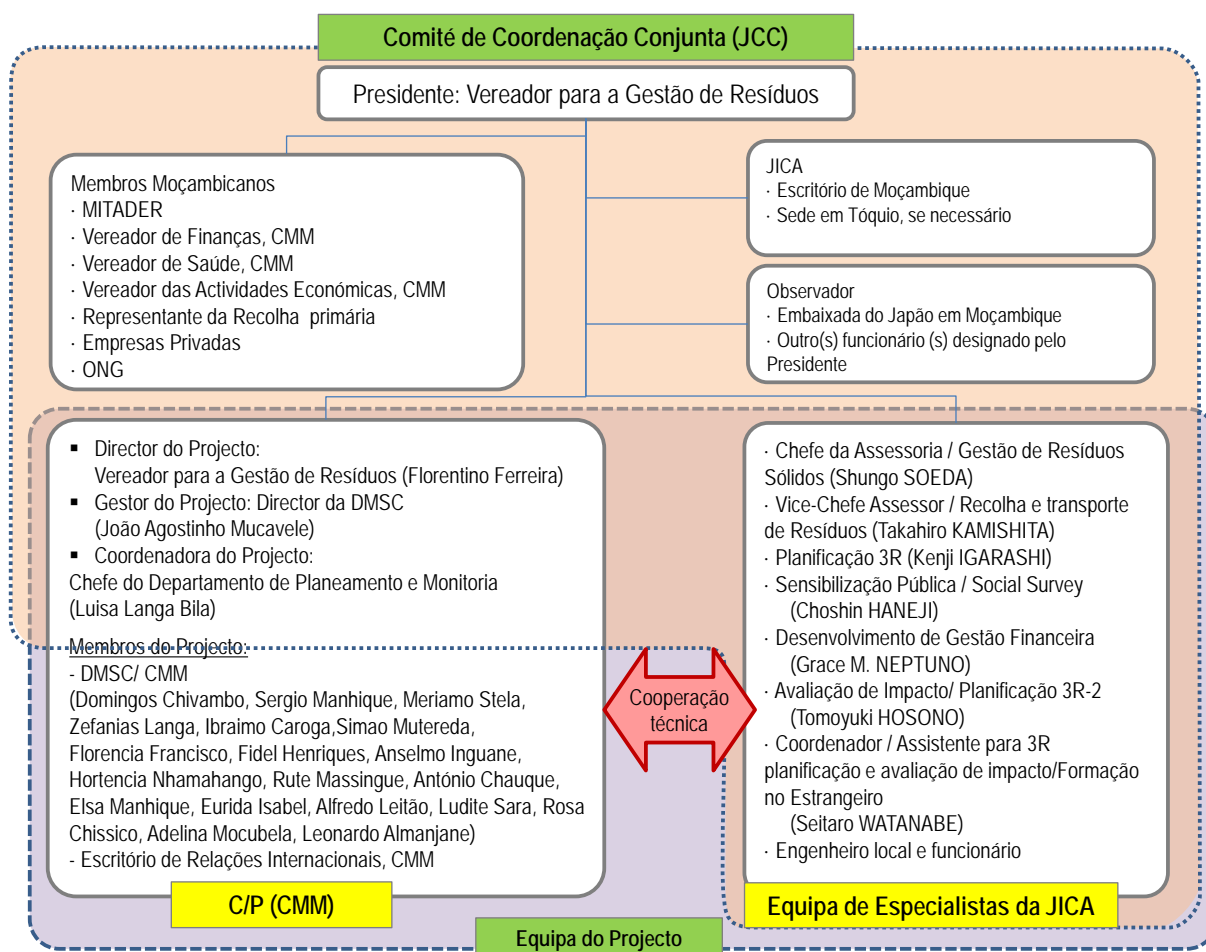


Fig 1.1 Estrutura de Implementação do Projecto

Conforme ilustra a Tabela 1.3, os funcionários da C/P são indicados em função dos grupos de resultados. Cada actividade do projecto será implementada pelos funcionários da C/P e pelos peritos da JICA indicados para cada grupo.

Tabela 1.3 Grupo de Implementação do Projecto para o 4º Ano

No.	Categoria	C/P	JET
1	Estrutura Organizacional	Luísa Bila, João Mucavele Domingos Chivambo	<u>Shungo Soeda</u> <u>Takahiro Kamishita</u> Elis Mavie
2	Contexto Lega de Gestão de Resíduos Sólidos	Sérgio Manhique, Luísa Bila	<u>Shungo Soeda</u> <u>Takahiro Kamishita</u> Cândida Boavida
3	Financial management	Rosa Chissico, Leonardo Almajane Ibraimo Caroga, Adelena Mocubela	<u>Grace Neptuno</u> <u>Shungo Soeda</u> Rolando Gemo
4	Recolha e Transporte	Luisa Bila, Meriamo Stela Zefanias Langa, Simão Mutereda Fidel Henriques, Anselmo Inguane Hortência Nhamahango, Rute Massingue, António Chauque, Elsa Manhique	<u>Takahiro Kamishita</u> <u>Shungo Soeda</u> <u>Chosin Haneji</u> <u>Tomoyuki Hosono</u> Elis Mavie
5	Tratamento e Deposição	Sérgio Manhique, Meriamo Stela Zefanias Langa, Fidel Henriques Anselmo Inguane	<u>Shungo Soeda</u> <u>Takahiro Kamishita</u> Cândida Boavida
6	Actividades de 3R	Sérgio Manhique, Luisa Bila Florência Francisco, Simão Mutereda Meriamo Stela	<u>Shungo Soeda</u> <u>Tomoyuki Hosono</u> <u>Takahiro Kamishita</u> <u>Chosin Haneji</u> Elis Mavie Mario Fijamo
7	Participação do Sector Privado e outros	Sérgio Manhique, Luísa Bila Simão Mutereda, Fidel Henriques Anselmo Inguane, Hortência Nhamahango	<u>Takahiro Kamishita</u> <u>Shungo Soeda</u> <u>Tomoyuki Hosono</u> Cândida Boavida
8	Educação Cívica	Eurídia Isabel, Alfredo Leitão Ludite Sara <i>Akemi Seki*, Yuta Yamazoe*</i> (*: JOCV)	<u>Chosin Haneji</u> <u>Shungo Soeda</u> <u>Takahiro Kamishita</u> Mario Fijamo


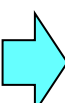

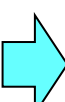

Os nomes sublinhados são dos peritos internacionais

2. Plano de Trabalho (Projecto Geral)

2.1 Concepção do Projecto

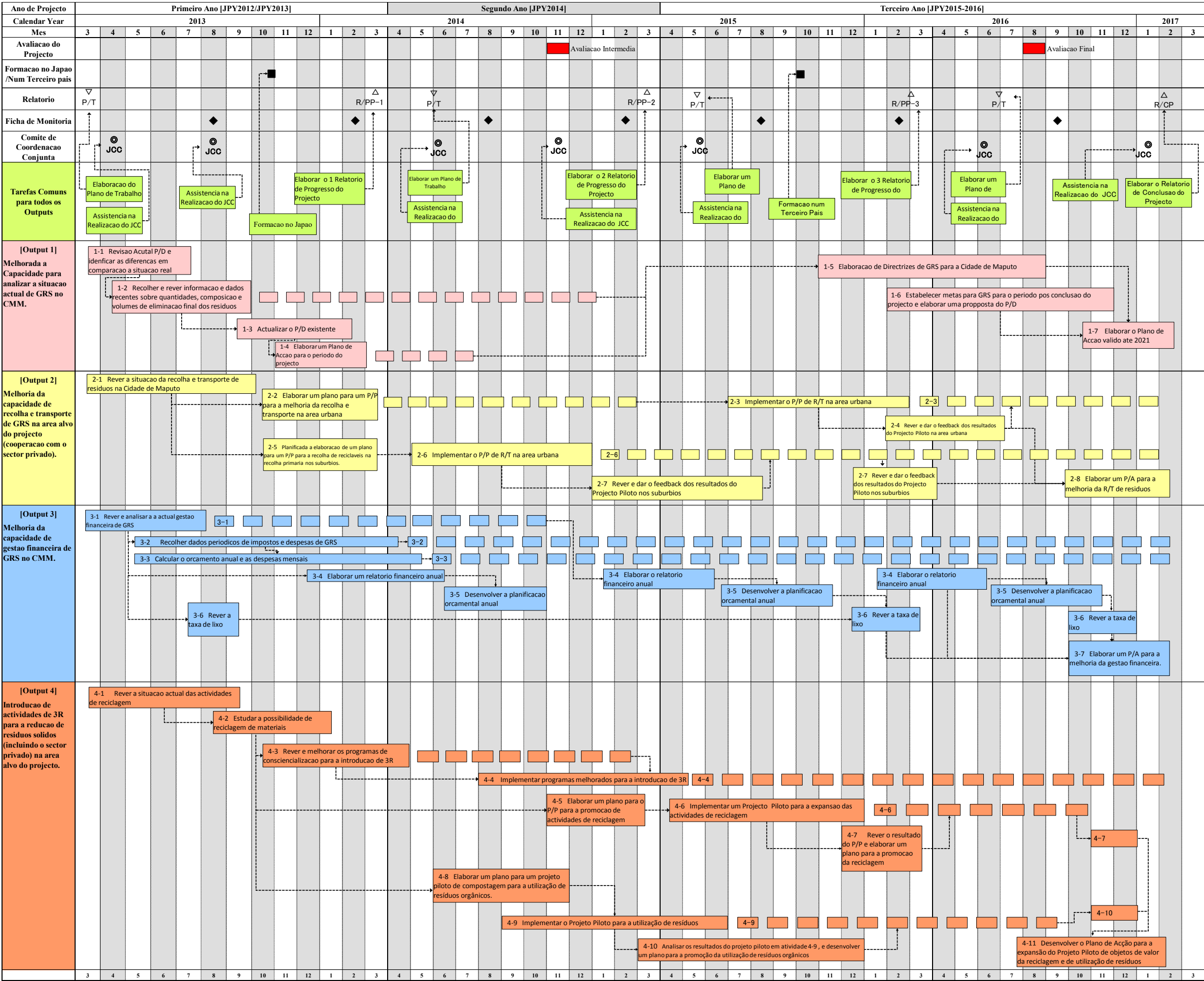
De forma a alcançar os resultados desejados, os pontos de enfoque e as abordagens ao projecto são ilustrados na Tabela 2.1.

Tabela 2.1 Pontos de Enfoque e Abordagens

	Pontos de Enfoque		Abordagens
Resultado 1	Aquisição, por parte da C/P, de habilidades sólidas para a revisão do P/D		Melhoria da análise de tarefas através de experiências, por parte da C/P, juntamente com a execução simultânea da actualização do P/D
Resultado 2	Desenvolvimento de confiança mútua entre o CMM, entidades privadas e os municípios (produtores de resíduos)		Clarificar as tarefas e responsabilidades dos provedores privados, produtores de resíduos e do CMM, e depois melhorar as capacidades de recolha e transporte através da partilha das melhorias da eficiência da recolha durante o projecto-piloto.
Resultado 3	Estabelecer um método para a recolha e gestão de dados financeiros e planificação e aplicação do orçamento.		Melhorar as capacidades de gestão financeira criando um ciclo apropriado de gestão de dados, planificação, submissão e de relatórios, tomando-se em consideração a futura independência económica da GRS no CMM
Resultado 4	Adquirir uma técnica para a medição da quantidade de material reciclável Implementar um processo conjunto, juntamente com os vários actores, para actividades viradas para 3R		Com a partilha do objectivo de redução da quantidade de resíduos entre os vários actores, a quantidade de material reciclado será monitorada e serão introduzidas actividades de 3R
Aspectos comuns a todos os Resultados	Confirmar a capacidade actual através de avaliações de capacidade. Implementar formações nacionais relacionadas com as necessidades do CMM Gerir tarefas de re-nomeação, desenvolver um sistema prático e sustentável da administração do projecto		O actual nível de capacidade será avaliado, partilhado e melhorado através da participação pró-activa da C/P e formações no Japão e noutro país.

2.2 Fluxo de Trabalho do Projecto

O fluxo de trabalho do projecto é ilustrado na Fig. 2.1



Nota: P/T: Plano de Trabalho, R/PP: Relatório do Progresso do Projecto, R/CP: Relatório da Conclusão do Projecto
P/D: Plano Director, P/A: Plano de Acção, R/T: Recolha e Transporte, P/P: Projecto Piloto

Fig. 2.1 Fluxo de Trabalho do Projecto

3 Plano de Trabalho (4º Ano)

3.1 Actividades para o Resultado 1

(1) Desenvolvimento de directrizes para a GRS para a Cidade de Maputo (Actividade 1-5)

As directrizes para a gestão dos resíduos sólidos, na tabela abaixo, serão conjuntamente desenvolvidas pela C/Ps e pelos peritos da equipa JICA, utilizando os resultados das actividades relacionados com os Resultados 2 a 4. Estas directrizes serão consideradas como informação básica para a elaboração do draft do P/D na actividade 1-6 e constituirão um documento oficial do CMM. As directrizes terão uma utilização prática não somente pelo CMM mas também pelo sector privado e ONGs relacionadas com 3R e a recolha e transporte de resíduos, uma vez enumerarem de forma clara, listas de controlo importantes para cada interveniente.

Tabela 3.1 Directrizes sobre a GRS a serem desenvolvidas durante o Projecto (Proposta)

Nome da Directriz (Proposta)	Conteúdos
• Directriz para a Revisão do P/D para a GRS	Pesquisa sobre a situação actual (pesquisa sobre a quantidade e qualidade dos resíduos, perspectivas futuras), Revisão do P/D e directrizes, Monitoria do plano de acção
• Directriz sobre a Recolha e Transporte GRS	Lista de controlo do equipamento de recolha, Lista de controlo da operação de provedores privados, Plano de formação do CMM, Gestão de contratos
• Directriz sobre a Gestão Financeira para a GRS	Organização das receitas e despesas, Processo de planificação do orçamento, Estimativas do custo unitário para o tratamento de resíduos, Desenvolvimento de um manual para a elaboração do relatório financeiro anual, Plano de formação do CMM
• Directriz para a Introdução de 3R	Considerações para as políticas de promoção de 3R, Considerações sobre as actividades de educação cívica, Explicações aos produtores de resíduos, Plano de formação do CMM.

(2) Estabelecimento de uma meta para a GRS para o período pós-projecto e elaboração do P/D proposta (Actividade 1-6)

Proposta do novo P/D e plano de acção a serem desenvolvidos nas actividades 1-6 e 1-7 serão considerados como sendo um compasso que tornará o CMM capaz de, continuamente, desenvolver as suas próprias capacidades após a conclusão do projecto. Recomenda-se que, se possível, estes documentos sejam aprovados pelo CMM dentro do ano do projecto. Quanto a aspectos técnicos, a equipa de peritos da JICA e os funcionários da C/P farão a revisão e o resumo dos resultados das actividades para os Resultados 2 a 4, de tal forma que a C/P seja capaz de analisar e sugerir que as lições aprendidas sejam incluídas no P/D revisto. Para além das melhorias da capacidade técnica, os pontos importantes ilustrados nas tabelas a seguir serão considerados pela C/P.

Tabela 3.2 Considerações sobre o Desenvolvimento da Proposta do P/D

Item	Considerações
Materialização das políticas de promoção de 3R para a redução dos resíduos (Resultados 2 e 4)	O P/D actual não inclui políticas prioritárias para a promoção de 3R. As políticas prioritárias verificadas pelas actividades do projecto serão incluídas. É necessária a coordenação com as instituições relacionadas de forma a conceber-se as recomendações para as políticas e leis de nível nacional.
Re-avaliação do indicador de monitoria para o P/D	O actual P/D inclui indicadores de monitoria com metas somente até 2010. Os indicadores e metas deverão ser reconsiderados, de forma a terem o horizonte temporal até 2027.
Desenvolvimento de um sistema de retenção de capacidades no CMM	É necessário que o CMM e as instituições relacionadas desenvolvam as suas próprias capacidades através de esforços auto-suficientes. Deverão ser considerados sistemas realísticos, incluindo a utilização de fontes externas como pesquisas e consultores.
Plano financeiro para a melhoria da gestão financeira e actualização do P/D revisto.	Deve-se considerar a melhoria da transparência e eficiência das finanças e do plano fiscal sustentável para o período após o término do apoio do PROMAPUTO, e das fontes de receitas externas se as fontes internas não puderem cobrir todas as despesas

Adicionalmente, o CMM aprovou quatro resoluções relacionadas com o P/D existente aprovado em 2007. Estas resoluções constituem a componente operacional do CMM para a GRS, e providenciam definições de resíduos, actores responsáveis e nível necessário para todo o ciclo de produção de resíduos até a deposição final, valor das taxas dos serviços de limpeza para os municípios e entidades privadas, licenças de controlo das entidades privadas registadas, sistema de contratação das empresas privadas para grandes produtores não domiciliados. Os pontos na tabela a seguir serão discutidos com o CMM visto que a revisão e/ ou suplemento destes regulamentos poderá ser necessário juntamente com a revisão geral do P/D.

Tabela 3.3 Considerações para a Revisão dos Regulamentos do CMM para a GRS e 3R

Perfil da Resolução	Pontos de Revisão
<p>• Resolução No. 86/AM/2008 – Postura de Limpeza de Resíduos Sólidos Urbanos do Município de Maputo</p> <p>Tratamento de resíduos urbanos alvo, definição de resíduos. Encontram-se também nesta resolução os requisitos de recolha, transporte e deposição final. A promoção de 3R e o princípio de poluidor pagador são regulados.</p>	<p>O primeiro objectivo de 3R é a redução da quantidade dos resíduos sólidos municipais a serem manuseados. Portanto, considera-se como sendo necessária a revisão do nome do regulamento ou a elaboração de um novo regulamento sobre a promoção de uma “sociedade orientada para a reciclagem”.</p>
<p>• Resolução No. 87/AM/2008 – Regulamento sobre a Fiscalização das Actividades de Limpeza no Município de Maputo</p> <p>A supervisão e monitoria são definidas como responsabilidades do CMM e da polícia. É estipulada a taxa de limpeza</p>	<p>São consideradas como sendo necessárias a alteração e adição e/ ou revisão relacionada com a supervisão e monitoria da indústria de reciclagem bem como para a promoção de 3R no regulamento.</p>
<p>• Resolução No. 88/AM/2008 – Regulamento sobre a participação do Sector Privado na Limpeza do Município de Maputo</p> <p>São definidas as condições e taxas das licenças das empresas privadas envolvidas nos serviços de limpeza (recolha e transporte). São estipulados os regulamentos sobre a prestação de serviços de recolha a grandes produtores de resíduos, por parte de empresas privadas licenciadas</p>	<p>São consideradas como sendo necessárias a revisão de regulamentos que lidam com o aumento da distância do transporte de resíduos resultante da construção do novo aterro sanitário, bem como das políticas relevantes sobre a promoção de 3R, tais como a promoção da reciclagem e a redução dos resíduos sólidos.</p>
<p>• Resolução No. 89/AM/2008 – Regulamento sobre os Componentes da Limpeza do Município de Maputo</p> <p>São definidos os requisitos, incluindo o equipamento e viaturas, horário de recolha e taxa de recolha de recolha e transporte de resíduos sólidos realizada pelo sector privado. É regulada a taxa dos serviços de recolha por meio de contratos com o CMM.</p>	<p>De forma a promover 3R, considera-se como sendo necessária a revisão de regulamentos relacionados com a introdução da separação dos resíduos bem como a revisão das taxas dos serviços.</p>

Ademais, o MITDER desenvolveu o Decreto 94/2014, que é o Regulamento sobre Gestão de Resíduos Sólidos Urbanos, de 31 de Dezembro de 2014 e descreve os conteúdos que devem constar do Plano Director no Artigo 8 e Anexo 1. Na verdade, a proposta dos conteúdos do Plano Director discutida e preparada pela C/P abrange quase todas as exigências de conteúdos. Uma vez que o regulamento exige também os resultados da análise dos problemas ou análise SWOT com base nas condições actuais, como parte das actividades do quarto ano, a C/P implementará positivamente tais análises junto com a JET durante o processo de preparação do Plano Director.

(3) Elaboração do Plano de Acção até 2021 (Actividade 1-7)
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Com base no P/D revisto, será elaborado o plano de acção após o projecto válido por 5 anos e que terá como meta 2021. As políticas prioritárias definidas no P/D revisto serão materializadas ao nível de trabalho, e o funcionário responsável será indicado. O orçamento e a estrutura de implementação após o projecto também serão claramente descritas.

(4) Continuação da monitoria do Plano de Acção durante o Período do Projecto (Continuação da Actividade 1-4)
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O plano de acção elaborado no segundo ano do projecto, conforme ilustrado na Tabela 3.5, será monitorado de forma contínua de quatro em quatro meses (três vezes por ano) pela DMSC. Os peritos da JICA vão providenciar assistência à C/P na avaliação dos resultados da monitoria e para a revisão do plano de acção, se necessário.

Tabela 3.5 Plano de Acção para o Período do Projecto Action

Capítulo do Plano Diretor	As medidas tomadas durante o período do projeto	A6.6-4.1 Criação de metodologias metodologias	Meta a ser alcançada durante o período do Projecto	Departamento/ Repartição Responsável	Funcionário Responsável	Departamentos/ Instituições Relevantes*	Principal Perito de apoio da JET	Despesas Directas da Actividade	Departamento/ Instituição Responsável pelas	Resultado Relacionado e actividades no âmbito	2014/2015				2015/2016				2016/2017			
											I	II	III	IV	I	II	III	IV	I	II	III	IV
											Abr.	Jul.	Out.	Jan.	Abr.	Jul.	Out.	Jan.	Abr.	Jul.	Out.	Jan.
1. Plano Diretor (Resumo e Princípios Básicos do Plano Diretor)	A1-1: Preparar o novo TDR para a atualização do P/D de 2007 através das discussões	Discussão	Novo TDR	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda			Actividade 1-6												
	A1-2: Discutir sobre o conteúdo dos princípios básicos que comparam com o princípio de orientação na Secção 6.1, incluindo o lema e objetivo	Discussão, Workshop	Capítulo 1 do novo P/D	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-6												
	A1-3: Preparar o sumário executivo do P / D	Discussão, workshop	Summario do P/D	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-6												
	A1-4: Preparar a directriz de gestão de resíduos sólidos	Discussion, workshop, OJT	Guia de GRS	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-5												
	A1-5: Impressão do novo P/D por parte do CMM	Outsourcing	Novo Livro dp P/D	RMCQ	TBD	Todos os outros departamento de DMGRSUS	(Soeda)	custo de impressã o	DMGRSUS	Depois do Projeto												
	A1-6: Recolha de informação sobre o sistema de GRS em outros países africanos com vista a preparar o plano de visitas, incluído o pedido de orç	Discussão	Plano de Visitas de Campo/ Plano de Orçamento	RMCQ	TBD	Todos os outros departamento de DMGRSUS	(Soeda)	não é necessário	não é necessário	-												
	A1-7: Realização de visitas a países vizinhos	Visita de campo	Relatório da Visita de Campo	RMCQ	TBD	Todos os outros departamento de DMGRSUS	(Soeda)	não é necessário	não é necessário	-												
2. Contexto Jurídico da GRS Urbano	A2-1: Rever o conteúdo detalhado do contexto legal existente	OJT	Capítulo 2 do novo P/D	RMCQ	Sergio	Todos os outros departamento de DMGRSUS	Soeda	não é necessário	não é necessário	Actividade 1-6												
	A2-2: Discutir com o MICOA sobre o estabelecimento de leis e regulamentos nacionais sobre a GRS em Moçambique	discussão	Plano de Acção do MICOA para o estabelecimento de leis	MICOA/LVIA	TBD	DMGRSUS	(Soeda)	não é necessário	não é necessário	não está relacionada												
3. Informações Básicas para GRS urbana	A3-1: Rever as informações básicas sobre a GRS	discussão, OJT	Capítulo 3 do novo P/D	RMCQ	Sergio	Todos os outros departamento de CMM	Soeda	não é necessário	não é necessário	Actividade 1-1, 1-2, 1-6												
4. GRS Actual	A3-1: Rever as informações básicas sobre a GRS																					
4.2 Orçamento e Gestão Financeira	A4.2-1 Elaborar o índice deste capítulo do P/D que seja mais relevante para as situações actuais	Discussão	Novo TDR	Repartição de Finanças	Sítoe/Chissico	nenhum	Neptuno	não é necessário	não é necessário	Actividade 3-1												
	A4.2-2 Determinar operações financeiras atuais	Discussão	Quadro financeiro atual	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-1												
	A4.2-3 Recolher e calcular as receitas e orçamentos mensais e anuais executados	Discussão, OJT	Receitas e orçamentos mensais e anuais	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-2, 3-3, 3-4												
4.8.2 Análise da Posição Financeira	A4.8-1 Elaborar o índice deste capítulo do P/D que seja mais relevante para as situações actuais	Discussão	Novo TDR	Repartição de Finanças	Sítoe/Chissico	nenhum	Neptuno	não é necessário	não é necessário	Actividade 3-1												
	A4.8-2 Observar e Analisar as limitações de operações financeiras atuais	Discussão, OJT	Situação financeira atual	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-3												
	A4.8-2 Observar e Analisar as limitações de operações financeiras atuais	Discussão, OJT	Base para estratégias na melhoria das receitas e custos	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-6												
	Orçamentos A4.8-4 Análises planificadas e executadas	Discussão, OJT	Base para estratégias na melhoria das receitas e custos	Repartição de Finanças	Sítoe/Chissico	Departamento de Administração e Finanças, Planeamento	Neptuno	não é necessário	não é necessário	Actividade 3-3												
5. Projeção Futura	A5-1 Realizar a análise detalhada da pesquisa sobre a quantidade e qualidade dos resíduos realizada em 2013	Discussão, OJT	Taxa de geração de resíduos	RMCQ	TBD	nenhum	Kamishita	necessário	não é necessário	Actividade 1-2												
	A5-2 Realizar a pesquisa sobre a quantidade e qualida de de resíduos em 2015	-	Taxa de geração de resíduos	RMCQ	TBD	nenhum	-	não é necessário	DMGRSUS	Actividade 1-2												
	A5-3 Recolher dados adicionais para suplementar a pesquisa sobre a quantidade e qualidade de resíduos realizada em 2013	OJT	Os dados cobrem todos os tipos de resíduos urbanos	RMCQ	TBD	Outras Direcções do CMM Detalhes serão determinados	Kamishita	não é necessário	não é necessário	Actividade 1-6												
	A5-4 Recolher os dados sobre a situação social e económica da Cidade de Maputo	Discussão, OJT	Indicadores Economicos	RMCQ	TBD	Outras Direcções do CMM Detalhes serão determinados	Kamishita, Neptuno	não é necessário	não é necessário	Actividade 1-2, 1-6												
	A5-5 Definir a população e o quadro económico até 2027	OJT	Últimas condições em 2015	RMCQ	TBD	Outras Direcções do CMM Detalhes serão determinados	Kamishita, Neptuno	não é necessário	não é necessário	Actividade 1-6												
	A5-6 Projetar a futura produção de resíduos assente num crescimento económico futuro.	OJT	Projeção (geração de resíduos e redução na fonte)	RMCQ	TBD	nenhum	Kamishita	não é necessário	não é necessário	Actividade 1-6												
6. Planeamento GRS urbano																						
6.1 Princípio orientador	A6.1-1: Desenvolver a imagem gráfica do novo P / D	Discussão, Workshop	Nova imagem gráfica	RMCQ	Sergio	Outras Direcções do CMM Detalhes serão determinados	Soeda	não é necessário	não é necessário	Actividade 1-6												
	A6.1-2: Finalizar o princípio orientador do novo P / D	Discussão, Workshop	Novo princípio básico	RMCQ	Sergio	Outras Direcções do CMM Detalhes serão determinados	Soeda	não é necessário	não é necessário	Actividade 1-6												
6.2 Instituição e Organização	A6.2-1: Elaborar planos para superar questões organizacionais (funcionários motivação, qualificação, salários, não de déficit etc.) Levantadas no P / D	Discussão, Workshop	Plano de melhoria organizacional	RMCQ	Luisa	Repartição de Recursos Humanos	Soeda, Koide	não é necessário	não é necessário	Actividade 1-6												
	A6.2-2: Identificar vantagens e questões da participação do sector privado e actualizar o P/D	Discussão, Workshop	P/D Atualizado	RMCQ	Luisa	Repartição de Gestão de Resíduos	Soeda, Koide	não é necessário	não é necessário	Actividade 1-6												
6.3 Opções para Remoção de Resíduos	6.3.1 Area Urbana	A6.3.1-1 Analisar a quantidade de resíduos relatado pelo contratante para a área urbana e que a registrada no local de despejo contra o valor estimado do contrato	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-1											
		A6.3.1-2 Identificar os problemas técnicos a serem resolvidos para a melhoria da recolha de resíduos na área urbana	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-1											
		A6.3.1-3 Pensar em medidas para resolver o problema presente na recolha de resíduos e transporte na área urbana	OJT, Discussão	Plano para Projecto Piloto	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-2											
		A6.3.1-4 Preparar um plano para o projeto-piloto para a melhoria da recolha de resíduos e transporte na área urbana	OJT, Discussão	Plano Para Projecto Piloto	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-2											
		A6.3.1-5 Realizar o projeto-piloto para a melhoria da recolha de resíduos e transporte na área urbana	OJT, Discussão	Relatório de execução do projeto-piloto	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-3											
		A6.3.1-6 Avaliar as opções recolha de resíduos para a área urbana	OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 1-5, Actividade 2-4											
		A6.3.1-7 Fazer a estimativa de custos para o trabalho de subcontratação com o equipamento necessário incluindo contentores e viaturas de recolha de resíduos em relação quantidade futura de recolha de resíduos na zona urbana.	OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 1-5											
	6.3.2 Area Suburbana (Recolha Secundaria)	A6.3.2-1 Analisar a quantidade de resíduos relatado pelo contratante para a coleta secundária na área suburbana, que gravou no local de despejo contra o valor estimado do contrato	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 2-1											
		A6.3.2-2 Identificar os problemas técnicos a serem resolvidos para a melhoria da coleta secundária na área suburbana	OJT, Discussão	Análise da situação atual	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	-											
		A6.3.2-3 Pensar em medidas para resolver o problema presente na recolha secundário na área suburbana	OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	-											
		A6.3.2-4 Verificar a medida para a melhoria da recolha secundária na área suburbana	OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	-											
		A6.3.2-5 Avaliar as opções recolha de resíduos para a recolha secundária em área suburbana	OJT, Discussão	projecto de P/D	RMCQ	Martins, Stela	Dept de gestão de resíduos sólidos	Kamishita	não é necessário	não é necessário	Actividade 1-5											

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Abreviaturas: P/D (Plano Diretor), OJT (Formação no local de trabalho), TBD (A ser determinado), TOC (Índice), RMCQ: Repartição de Monitoria e Controle de Qualidade, GECPAF: Gabinete de Educação Cívica, Planejamento Ambiental e Fiscalização

3.2 Actividades para o Resultado 2

(1) Implementação do P/P para a melhoria da recolha e transporte de resíduos em cooperação com o sector privado, na zona urbana (Continuação da Actividade 2-3) Revisão e feedback dos resultados do P/P implementado na Actividade 2-3 (Continuação da Actividade 2-4)
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Com base no plano preparado no segundo ano do projecto para o P/P na actividade 2-2, o P/P para a melhoria da recolha e transporte de resíduos sólidos em cooperação com o sector privado na zona urbana foi implementado pela DMSC com a assistência da equipa de peritos da JICA. Este P/P avaliou as seguintes hipóteses: “O reforço da coordenação entre as repartições e provedores para a utilização da informação existente pode aumentar as acções para a melhoria”

Como resultado da implementação do P/P (Actividade 2-3), os seguintes factos foram obtidos. A possibilidade da continuação da intervenção do P/P será decidida pela DMSC tomando em consideração a análise e avaliação destes resultados. Se se decidir pela continuação da intervenção, a equipa de peritos da JICA vai continuar a providenciar aconselhamento em relação às intervenções, incluindo a revisão das estruturas da intervenção.

- Pode se dizer que nem todos os objectivos não foram alcançados, porque levou muito tempo para instruir e formar a C/P sobre a preparação de relatórios diários/semanais para os funcionários da DMSC envolvidos e as medidas correctivas com base nos dados obtidos foram claramente tomadas. Contudo, tendo em conta que os esforços para implementar tais medidas estão ainda em curso, há uma grande expectativa que as medidas sejam utilizadas para melhorar a recolha e transporte de resíduos devido à continuação acções fortificadas pelo P/P.
- Outras questões relacionadas com a implementação do P/P
 - Registo imperfeito das medidas de curto prazo levadas a cabo pela DGRSU e pela Repartição de Fiscalização.
 - Discrepância nos métodos de registo da localização dos contentores de lixo entre a Repartição de Fiscalização e os provedores privados.
 - Capacidade limitada da DGRSU e Repartição da Fiscalização.

(2) Continuação da implementação do P/P para a introdução da recolha de material reciclável na recolha primária de resíduos sólidos na zona suburbana (Continuação da Actividade 2-6) Continuação da revisão e retroinformação do resultado do P/P para a recolha de material reciclável na zona suburbana (Continuação da Actividade 2-7)

No terceiro ano, não foi realizada nenhuma intervenção substancial pela DMSC em relação ao P/P de introdução da recolha de recicláveis. A M/E que participou no P/P continuou com a recolha de recicláveis por sua própria iniciativa.

Seguem-se as principais implicações do P/D actualizado com base nas lições aprendidas através do P/P a serem reflectidas na preparação do P/D:

- Adoptar intervenções eficientes em termos de custos:
Uma vez que não houve diferença na eficiência das intervenções, jugou-se que a intervenção de disponibilização de baldes de separação foi a intervenção mais eficaz.
- Minimizar os custos de intervenção:
Muitos custos de intervenção tinham a ver com despesas de pessoal e custos de transporte. Portanto, o desejável seria mobilizar o pessoal nos bairros e na DMSC.
Espera-se uma redução dos custos de aquisição ao usar os bens/materiais tais como material reciclado e aplicando os em uma larga escala.
- Sensibilização de residentes:
Espera-se uma maior cooperação na deposição separada de resíduos através do reforço da sensibilização ambiental dos residentes
- Promoção da indústria de reciclagem na Cidade de Maputo:
Se for instalada uma indústria de reciclagem de vidro na Cidade de Maputo, as garrafas de vidro importadas e as garrafas partidas teriam valor e a reciclagem das mesmas seria promovida.
- Fornecer instalações de armazenamento e transporte às MEs que promovem a recolha de recicláveis:
Foi observado que a falta de espaço de armazenamento dos recicláveis recolhidos e o seu custo de transporte foi obstáculo mais crítico para as iniciativas de recolha de recicláveis por parte das MEs.
- Comparação da eficácia e eficiência com vários métodos de reciclagem:
Será necessária uma comparação entre o P/P de redução de resíduos orgânicos e o P/P de recolha de recicláveis.
- Reconhecer o verdadeiro custo do tratamento convencional de resíduos:
Os custos de recolha primária e secundária estão a aumentar ano após ano.
Já foi decidido que a lixeira de Hulene será encerrada em breve e que será construído um novo aterro sanitário na Cidade da Matola.
Espera-se que os preços da recolha e transporte de resíduos venham a aumentar drasticamente por causa do aumento da distância de transporte e da instalação de um centro de transferência.
Espera-se também que o custo de deposição final venha a aumentar drasticamente uma vez que o local de deposição final na Matola irá adoptar o método de aterro sanitário.
Refira-se que a actual lixeira de Hulene é uma lixeira a céu aberto e os seus custos de deposição não incluem os custos externos relacionados com aspectos ambientais e sociais
É necessário comparar a rentabilidade dos projectos de reciclagem propostos com os custos de recolha, transporte e deposição de resíduos no futuro.

(3) Elaboração do plano de acção para a melhoria da recolha e transporte (Actividade 2-8)

Com base nos resultados dos dois P/P (Actividades 2-3 e 2-6), serão elaborados planos de melhoria da recolha e transporte tanto para a zona urbana como para a zona suburbana. Os planos serão materializados ao nível de trabalho, e serão indicados os funcionários responsáveis. Após a conclusão do projecto também serão clarificadas as questões relacionadas com o orçamento e a estrutura de implementação.

3.3 Actividades para o Resultado 3

(1) Recolha de Dados Periódicos sobre as Receitas e Despesas Relacionadas com a Gestão de Resíduos Sólidos (Actividade 3-2) (Continuação do 2º Ano)

A equipa do projecto vai continuar com as mesmas actividades realizadas no terceiro ano relativas à recolha e a organização de dados sobre as receitas e despesas da GRS. Adicionalmente, através do uso do modelo comum para o registo de dados financeiros apresentado no ano anterior do projecto, para tornar mais curtos os atrasos na partilha de dados, devido à fraca colaboração na partilha de informação. O registo de dados financeiros vai igualmente continuar durante o terceiro ano do projecto, de forma a preparar dados básicos para a avaliação do desempenho financeiro da GRS, planificação orçamental e preparação do relatório financeiro anual.

(2) Calcular o orçamento anual e as despesas mensais (Continuação da Actividade 3-3)

À semelhança do terceiro ano, os dados recolhidos sobre as receitas e despesas serão continuamente digitalizados e analisados para o cálculo do orçamento anual e despesas mensais para os itens identificados que serão determinados como sendo necessários para a GRS no ano seguinte. A análise do orçamento planificado e executado da DMSC irá também continuar junto com a comparação do histórico do desempenho financeiro do sector de GRS.

(3) Elaboração do Relatório Financeiro Anual (Continuação da Actividade 3-4)

O Relatório Anual que inclui a análise financeira detalhada sobre principais actividades especificadas será elaborado pela C/P da DMSC tanto quanto possível, com a assistência ocasional da Equipa de Peritos da JICA, usando o modelo de relatório desenvolvido no segundo ano.

(4) Elaboração do relatório de planificação orçamental (Continuação da Actividade 3-5)

Depois das actividades do terceiro ano, o relatório de planificação orçamental para o ano 2017 será preparado com a assistência da equipa de peritos da JICA, tendo em conta os seguintes pontos:

- Começar com as actividades iniciais no princípio de Junho de forma a garantir a elaboração de um orçamento bem planificado,;
- Gestão rígida de tempo para que as sessões de planificação orçamental iniciem no tempo apropriado;
- Aquisição de material de referência para apoiar as actividades e orçamentos propostos, por exemplo, orçamentos anteriores ou despesas actuais, base para as metas das actividades para o ano, cotação de material ou serviços ilustrando as estimativas dos preços de mercado.

- Envolvimento de funcionários de várias repartições para além dos chefes destas repartições ou departamentos, para que surjam melhores perspectivas e opiniões;
- Garantir a consistência entre as actividades de GRS e os itens a serem adquiridos.

(5) Revisão da Taxa de Limpeza (Continuação das Actividade 3-6)
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Continuando desde o terceiro ano, com o reconhecimento dos problemas actuais, a equipa do projecto irá analisar a necessidade de alteração da taxa de lixo e de outras taxas tais como a taxa da lixeira, Taxa dos Contractos, Licença ou remoção especial incluindo o seu sistema de recolha em colaboração com os departamentos relevantes.

Tal como o exposto acima, tentaremos obter dados detalhados da EDM tais como o número real de consumidores com base nas categorias e nos níveis de consumo de electricidade e também, os resultados e efeitos do aumento da taxa de limpeza em 30% em todos os sectores, anunciado em Dezembro de 2014, deverão ser examinados de modo contínuo.

Adicionalmente, a análise SWOT sobre o método alternativo de pagamento da taxa de limpeza será continuado, com base no resultado pesquisa de questionário realizadas no terceiro ano em relação ao desempenho e compreensão da recolha da taxa para os grandes produtores não domésticos de resíduos, a fim de incluí-los no plano director.

(6) Elaboração do Plano de Acção para a melhoria da gestão financeira (Actividade 3-7)

Com base na recolha e análise de dados sobre as receitas e despesas, elaboração do relatório financeiro anual, planificação do orçamento e revisão da taxa de limpeza (Actividades 3-2, 3-3, 3-4, 3-5, 3-6), o plano de acção para a melhoria da gestão financeira será conjuntamente elaborado pelos funcionários da C/P e a equipa de peritos da JICA. O plano será materializado em documento de trabalho e os técnicos responsáveis serão indicados. O orçamento e a estrutura de implementação após a conclusão do projecto também serão descritos de forma clara.

3.4 Actividades para o Resultado 4

(1) Implementação de programas melhorados para a introdução de 3R (Continuação da Actividade 4-4)

Com base no Plano Estratégico para a Educação Cívica relacionada com a GRS e a introdução de 3R, preparado no terceiro ano do projecto, programas melhorados de educação cívica serão implementados de modo contínuo. A introdução dos conceitos de 3R em escolas primárias e secundárias nos Distritos Municipais de Maputo, pela DMSC, concretamente pelo Gabinete de Educação Cívica e Promoção Ambiental, junto com assistência técnica da equipa de peritos da JICA e do trabalho colaborativo dos JOCVs vai continuar.,

Ao mesmo tempo, o programa de introdução de 3R, incluindo as experiências nas actividades em escolas ou outras obtidas através da participação nos P/Ps serão claramente incluídos no plano director.

(2) Implementar um P/P para a expansão das actividades de reciclagem (Continuação da Actividade 4-6) Revisão dos resultados do P/P, e elaboração de um plano para a promoção da reciclagem (Continuação da Actividade 4-7)

Através da implementação do P/P conforme a actividade 4-6 foram clarificadas as seguintes questões em relação à expansão de programas de reciclagem:

- Esquemas de definição de preços sob o controlo do CMM tendo em conta que um Mercado de recicláveis transparente e equânime é necessário por forma a implementar o P/P como parte dos serviços públicos.
- Pode ser considerada a criação de instalações para armazenamento por um longo período a fim de ultrapassar situações de flutuação do Mercado de recicláveis.
- A ME deverá contactar os compradores com antecedência de forma a transportar e vender os recicláveis a mais de um comprador e maximizar as vendas.
- Uma análise cuidadosa da partilha de custos para a continuação de actividades é necessária porque os custos iniciais e os custos de operação poderão ser superiores aos rendimentos provenientes da venda de recicláveis.

A DMSC deverá determinar a continuação do P/P de reciclagem e a avaliação do resultado do P/P, incluindo a identificação de questões e medidas necessárias, juntamente com a equipa de peritos da JICA. A proposta de um plano adicional de promoção será discutida durante o período de preparação do plano director para a introdução de programas de 3R, por iniciativa principal da DMSC com apoio da equipa de peritos da JICA.

<p>(3) Continuação da implementação do P/P de utilização de resíduos orgânicos (Continuação da Actividade 4-9) Continuação da revisão dos resultados do P/P, e elaboração do plano para a promoção da utilização de resíduos orgânicos (Continuação da Actividade 4-10)</p>

O P/P para a utilização de resíduos orgânicos em si terminou com a organização de um Workshop em Janeiro de 2016. Como resultado do P/P, é possível propô-lo como medida para reduzir a quantidade de resíduos usando o condicionador de solo. Por outro lado, uma vez que foi contatado que a qualidade do condicionador de solo produzido durante o P/P variava de agredado para agregado, será necessária uma instrução e formação contínua será necessária para obter um certo nível de qualidade. Adicionalmente, uma vez que alguns agregados desistiram do P/P, é necessária uma participação e cooperação positiva dos agregados. Felizmente, muitos agregados demonstrou interesse em continuar com as actividades..

DMSC, em cooperação com a equipa de peritos da JICA irá discutir sobre a expansão do P/P para a utilização de resíduos orgânicos, junto com a preparação do P/D.

<p>(4) Elaboração de um P/A para a expansão dos P/P para a reciclagem de resíduos e utilização de resíduos orgânicos (Actividade 4-11)</p>

Com base nos resultados da revisão dos dois P/Ps (Actividade 4-7 e 4-10), serão desenvolvidos planos de expansão de reciclagem de resíduos bem como de utilização de resíduos orgânicos, por iniciativa da DMSC, com a Assistência Técnica da equipa de peritos da JICA.

Durante o período de preparação do plano de expansão acima referido, a experiência obtida através do projecto-piloto de introdução da recolha de recicláveis no Bairro Chamanculo D, onde uma quantidade considerável de garrafas de cerveja estrangeira teve que ser acumulada devido à situação do mercado de reciclagem, será futuramente discutida para encontrar uma solução.

O plano será convertido em instrumento de trabalho e serão indicados os funcionários responsáveis. O orçamento e a estrutura de implementação após o término do projecto também serão claramente descritos.

3.5 Outras Actividades

(1) Preparação e Realização do JCC

A 6ª Reunião do JCC será realizada em Junho de, para a aprovação do Plano de Trabalho (proposta para o 3º Ano) e concluir os indicadores da PDM (com base na versão 3.0). Subsequentemente, a 6ª Reunião do JCC será realizada aproximadamente em Abril ou Maio de 2016, para a aprovação do Plano de Trabalho (3º Ano: 2) para a finalização das actividades da parte final do terceiro e quarto ano do projecto. A Reunião do JCC final será realizada aproximadamente em Janeiro de 2017 de modo a reportar a situação relacionada com a conclusão do projecto.

Poderá ser organizado uma outra reunião do JCC se necessário, aquando da avaliação final da JICA em Agosto de 2016, à semelhança do período de revisão intermédia em Novembro de 2014.

(2) Monitoria Semestral

A monitoria das actividades do projecto será realizada em cada semestre, aproximadamente em Agosto de 2015, Fevereiro de 2016 e Agosto de 2016. As fichas de monitoria e o registo das actividades do projecto serão anexados aos relatórios de progresso e final do Projecto.

(3) Avaliação da Capacidade

A avaliação da capacidade em relação à capacidade do CMM para a GRS será realizada conjuntamente, em Fevereiro de 2016 e Janeiro de 2017, pela C/Ps e pela equipa de peritos da JICA. Os resultados serão comparados com os resultados da avaliação da capacidade realizada no primeiro e segundo anos do projecto. A avaliação será composta pelas seguintes três perguntas por cada actividade:

- Resultado da aprendizagem sobre a actividade
- Capacidade humana para a implementação da actividade
- Capacidade organizacional para a sustentabilidade da actividade

4 Relatórios

A equipa do projecto irá elaborar relatórios conforme ilustrado na tabela abaixo e submetê-los à JICA.

Tabela 4.1 Lista de Relatório

Ano	Nome do Relatório	Submissão	Número de Relatórios
Terceiro e Quarto Ano	Plano de Trabalho (3º e 4º ano 2)	Julho, 2016	<ul style="list-style-type: none"> • 3 cópias em Japonês • 3 cópias em Português • 1 CD-R
	Relatório de Conclusão do Projecto	Fevereiro, 2017	<ul style="list-style-type: none"> • 3 cópias em Japonês • 3 cópias em Português • 1 CD-R

Tabela 4.2 Itens a serem Reportados (rascunho)

Relatório	Itens a serem reportados	
Relatório de Progresso do Projecto /Relatório de Conclusão do Projecto	a) Linhas gerais do projecto (histórico, cronologia, objectivos) b) Conteúdo das actividades (descrito de acordo com o gráfico de fluxo do projecto) c) Aspectos, esquemas e percepções no decurso da implementação e operação do projecto (metodologia de implementação do projecto, sistema operacional, etc.) d) Nível de realização dos objectivos do projecto (sumário da avaliação interina e final do projecto) e) Sugestões para o alcance dos objectivos gerais. f) Plano de actividade para o próximo período (somente no relatório de progresso)	
	Material em anexo <ul style="list-style-type: none"> • MDP (Última versão, detalhes de transição) • Fluxograma do Projecto • Detalhes do plano de actividades • Histórico de alocação de especialistas (plano do pessoal necessário para o projecto: última versão) • Lista de formandos seleccionados • Lista de provisão do equipamento e equipamentos complementares (incluindo lista de entrega) • Acta da reunião do JCC, etc. • Lista de outras actividades 	Produtos da cooperação técnica em anexo <ul style="list-style-type: none"> • Plano Director Revisto • Plano de Acção válido até 2021 • Directrizes para a Gestão de Resíduos Sólidos (A versão em Inglês e Português serão anexados o progresso ou conclusão relevantes.)

Nota: d), e) e a lista de entrega devem ser feitos apenas para o relatório de conclusão do projecto.

5 Equipamentos Usados nas Operações de Campo

A equipa do projecto usa o equipamento adquirido pela JICA indicado na tabela abaixo para implementar o projecto-piloto. Detalhes sobre equipamento adicional a ser adquirido no terceiro e quarto ano do projecto para o P/P de recolha e transporte serão finalizados respeitando o plano de intervenções do PP.

Tabela 5.1 Equipamento para a Operação de Campo

Ano de Aquisição	Nome do Equipamento	Número de Unidade	Especificações
Primeiro Ano	Máquina Multifuncional Impressora/fotocopiadora	1	Tamanho A3, alimentador automático
	Impressora a Laser	1	Tamanho A4, monocromático
	GPS	3	Garmin eTrek Vista
	Computador Desktop	2	MS Office, Software do Antivírus, UPS
	Laptop	3	MS Office, Software do Antivírus
	Projector	1	Brilho: acima de 2500 lúmens
	Câmara de Vídeo	2	HD Alta definição, prova de água, prova de poeira
	Câmara digital	2	—
Terceiro e Quarto Ano	Laptop [para o P/P]	2	MS Office, Software de Antivírus (para o PP de recolha e transporte)

6 Compromissos

Para implementar o projecto de forma suave são esperados certos compromissos do lado moçambicano.

O CMM deve desempenhar um maior papel com alto sentido de apropriação no alcance dos objectivos do projecto, enquanto o papel dos especialistas da JICA continuará a ser de apoio.

O CMM apoia aos especialistas da JICA da seguinte maneira.

- Faz todo o esforço para disponibilizar o pessoal necessário e pessoal previamente alocado para desempenharem o papel principal na implementação do projecto.
- Oferece as instalações/equipamento necessários para a implementação do projecto.
- Oferece o espaço do escritório para os especialistas da JICA.
- Cobre os custos necessários do projecto incluindo:
 - Salário e outras ajudas de custo para os funcionários públicos
 - Despesas de serviços de utilidade pública tais como electricidade, abastecimento de água e combustível
 - Custos operacionais de desembaraço aduaneiro, armazenamento e transporte nacional
 - Direitos aduaneiros, impostos internos e outros impostos fiscais que possam ser necessários para o projecto em relação à compra dos produtos e serviços.
- Garante a participação de microempresas, associações e empresas privadas que desempenham o principal papel na recolha e transporte, para o projecto.
- Garante a participação do sector privado e outros intervenientes relevantes tais como LVIA, AMOR etc., que desempenham o principal papel no sistema de 3R.
- Aprova o P/D o mais breve possível por forma a não comprometer o progresso e objectivos do Projecto.
- Toma medidas adequadas para divulgar o projecto na Cidade de Maputo.
- Faz a coordenação necessária com outros doadores.

Appendix 4

Record of Expert Assignment

Record of Expert Assignment

Project Title: The Project for Promotion of Sustainable 3R Activities in Maputo (3rd and 4th Year)

1. Works in Mozambique

Name (Position)		Travel No.	2015												2016												2017						M/D Total	M/M Total
			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						
Shungo SOEDA Chief Advisor/ Solid Waste Management	Plan	10																															301	10.03
	Actual	9																															308	10.26
Takahiro KAMISHITA Dupty Chief Advisor/ Waste collection and transportation	Plan	6																															235	7.83
	Actual	6																															237	7.9
Kenji IGARASHI 3R Plan	Plan	3																															119	3.97
	Actual	3																															119	3.97
Choshin HANEJI Civic education/ Social survey	Plan	4																															133	4.43
	Actual	4																															133	4.43
Grace Marco Neptuno Finanial Management	Plan	5																															208	6.93
	Actual	5																															208	6.93
Tomoyuki HOSONO Impact analysis/ Source separated collection/ 3R Plan	Plan	6																															165	5.5
	Actual	6																															165	5.5
Ryu KOIDE Project Coordination/3R assistance/Training plan in 3rd country	Plan	4																															132	4.4
	Actual	4																															132	4.4
Seitaro WATANABE Project Coordination/3R assistance/Training plan in 3rd country	Plan	4																															180	6
	Actual	4																															180	6
																											Plan	1473	49.09					
																											Actual	1482	49.39					
																											Sub-ttal							

2. Works in Japan

[illegible]

TOTAL	Plan	50.39
	Actual	50.39

[illegible]

Appendix 5

Record of Training

Training Program

Day	Training Activities	Lecturer
12 th Oct. (Sat)	Departure from Maputo	-
13 th Oct. (Sun)	Arrival in Tokyo	-
14 th Oct. (Mon)	Day off (National Holiday in Japan)	-
15 th Oct. (Tue)	Briefing on training course	JICA and Nippon Koei Co., Ltd
	Orientation on training program	
16 th Oct. (Wed)	Lecture: Solid waste management and 3R policy in Japan, Ministry's involvement in solid waste management administration by local governments	Ministry of Environment, Government of Japan
	Lecture: Formulation of master plan on solid waste management in the local government	Nerima Ward, Tokyo ^{*1}
	Lecture: Collection and transportation of solid waste in the local government	
17 th Oct. (Thu)	Site visit: Solid waste collection site in Tokyo	Shinjuku Ward, Tokyo
	Site visit: Solid waste transfer station	
	Site visit: Environmental education institute	Nishi-waseda Recycling Activity Center
18 th Oct (Fri)	Site visit: Waterfront landfill site along Tokyo Bay	Tokyo Metropolitan Government
	Site Visit: Waste information equipment recycling plant	Re-tem Corporation
	Site visit: Food waste biogas power plant	Bioenergy Co., Ltd.
	Discussion with the project members	Nippon Koei Co., Ltd.
19 th Oct. (Sat)	Day off	-
20 th Oct. (Sun)	Day off (Move from Tokyo to Nagoya)	-
21 st Oct. (Mon)	Lecture: 3R activities in local government	Nagoya City
	Site visit: Solid waste incineration plant	
	Site visit: Resources sorting plant	
	(Move from Nagoya City to Tajimi City)	-
22 nd Oct. (Tue)	Site visit: Solid waste separated collection site in Tajimi City	Tajimi City
	Lecture: Solid waste management in Tajimi City	
	Site visit: Closed system final disposal site	
	Site visit: Composting facility	
	(Move from Tajimi City to Tokyo)	-
23 rd Oct. (Wed)	Site visit: Solid waste collection site in Chofu City	Chofu City
	Lecture: Formulation of solid waste collection and transportation plan	
	Lecture: Door to door collection, Charging fee for waste disposal	
24 th Oct. (Thu)	Site visit: Inland solid waste final disposal site and Eco-cement plant	Tokyo-Tama Regional Resources Recycling Union
	Preparation of presentation	Nippon Koei Co., Ltd.
25 th Oct. (Fri)	Presentation by trainees, evaluation and certificate ceremony	JICA, Nippon Koei Co., Ltd.
26 th Oct. (Sat)	Departure from Tokyo	-
27 th Oct. (Sun)	Arrival in Maputo	-

*1: Mr. Soeda, Team Leader of JET give lectures on behalf of officers of Nerima Ward who could not do it due to a typhoon.

List of Trainees

No.	Name	Organization and Position	Remarks
1	Florentino Ferreira	Councilor of Urban Solid Waste Management and Sanitation, Maputo City	Control the overall project and make arrangements through other departments in CMM
2	Joao Agostinho Mucavele	Director, DMGRSUS, Maputo City	have responsibility waste management in Maputo
3	Sergio Manhique	Head of Monitoring Section, Planning and Monitoring Dept., DMGRSUS, Maputo City	in charge of overall formulation of master plan and citizen enlightenment
4	Martins Mandlate	Head of Waste Management Dept., DMGRSUS, Maputo City	control waste collection and transportation works
5	Rosa Paulo Chissico	Financial Management Section, Administration and Human Resources Dept., DMGRSUS, Maputo City	In charge of finance
6	Anselmo Salvador Inguane	Monitoring Section, Planning and Monitoring Dept., DMGRSUS, Maputo City	monitor waste collection and transportation works
7	Euridia Cesar Siteo	Monitoring Section, Planning and Monitoring Dept., DMGRSUS, Maputo City	monitor waste collection and transportation works
8	Florencia Francisco Martins	Monitoring Section, Planning and Monitoring Dept., DMGRSUS, Maputo City	In charge of 3R activities

Detail Schedule of Training (Actual)

Nome do Curso :	Projecto para a Promoção de Actividades Sustentáveis de 3R em Maputo (3º & 4ºano) Formação no Brazil				
Período :	26 de Set de 2015	~	11 de Out de 2015	Número de Formand	8

12th Oct 2015

Objecto :	Compreender, de forma exaustiva, a gestão de resíduos e políticas de 3R no Brasil e utilizá-la para a actualização do P/D em Maputo
Ítems da Formação	1) Legislação, plano director e directrizes para a gestão de resíduos e 3R, com o papel do governo federal, estadual e municipal 2) Operação, gestão de contratos e monitoria da recolha e transporte de resíduos urbanos 3) Gestão e organização financeira relacionada com a gestão de resíduos eficiente e transparente 4) Estratégias e políticas para a introdução de 3R, incluindo compostagem, separação de resíduos, reciclagem e educação cívica 5) Local de deposição final e aspectos relacionados com catadores (actividades das associações de catadores)

Data	Horas	Tipo	Conteúdo	Orador/ Visita de Campo			Língua	Local	Acomodação
				Nome	Organização	Contacto			
26-Sep(Sat)	16:30 ~		Chegada a São Paulo	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japões/ Português	Aeroporto de Guarulhos	Feller Hotels Av. Paulista
27-Sep(Sun)	10:00 ~ 12:00		Briefing	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japões/ Português	Sala de Reuniões	Feller Hotels Av. Paulista
28-Sep(Mon)	9:00 ~ 10:00	Palestra	Visão geral da gestão de resíduos cidade de São Paulo	Tadeu Dias Pais	Chefe do Departamento de Planificação e Desenvolvimento, AMLURB	(11)3397-1715	Português	AMLURB	
	10:00 ~ 11:00	Apresentação	Apresentação sobre a Gestão de resíduos na cidade de Maputo	Ferreira	Vereador do Município de Maputo	-	Português	AMLURB	
	11:00 ~ 12:00		Encontro com Secretaria de Serviços e Presidente de AMLURB	Simão Pedro/Bacchim	Secretário de Serviços/ Presidente da AMLURB, Cidade de São Paulo	(11)3397-1711	Português	Departamento de Serviços	
	15:00 ~ 16:00	Visita de Campo	Aterro sanitário (CTR Caieiras)	Ricardo Folloni/Índira Rodrigues	Departamento de Gestão de Serviços, AMLURB/Loga	(11)3397-1801	Português	CTR Caieiras	Feller Hotels Av. Paulista
29-Sep(Tue)	9:00 ~ 11:00	Palestra	Plano de Gestão Integrada dos Resíduos Sólidos da Cidade de São Paulo	Julia Lara	Gabinete do Secretário, AMLURB	(11)3397-1807	Português	AMLURB	
	13:30 ~ 14:30	Visita de Campo	Visita a Feira RWM Brasil (Feira RWM Brasil)	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Português	Centro de Exposição Transamerica	
	14:30 ~ 18:30	Palestra	Palestra sobre gestão de resíduos do Brasil / Recepção (Feira RWM Brasil)	Gabriela	ABRELPE	(11)3329-5898	Português	Centro de Exposição Transamerica	Feller Hotels Av. Paulista
30-Sep(Wed)	9:00 ~ 10:15	Palestra	Gestão de Contratos de Limpeza Urbana	Eduardo Rodrigues	Departamento de Gestão de Serviços, AMLURB	(11)3397-1788	Português	AMLURB	
	10:15 ~ 11:30	Palestra	Medidas para combater descarte ilegal	Evaldo Gomes	Departamento de Gestão de Serviços, AMLURB	(11)3397-1726	Português	AMLURB	
	11:30 ~ 12:30	Palestra	Coleta de Resíduos e Sistemas de Monitoramento (FISCOR)	David Tegangno	Departamento de Gestão de Serviços, AMLURB	(11)3329-4858	Português	AMLURB	
	14:30 ~ 15:00	Visita de Campo	Associação de Catadores (Cooperacaps)	Telines Nascimento	Presidente, Associação de Catadores (Cooperacaps)	(11)99369-6124	Português	Cooperacaps	
	15:00 ~ 15:30	Palestra	Historia da Cooperacaps	Telines Nascimento	Presidente, Associação de Catadores (Cooperacaps)	(11)99369-6124	Português	CTM Carolina Maria de Jesus	
	15:30 ~ 16:00	Visita de Campo	Centro de Triagem Automatizada (CTM Carolina Maria de Jesus)	Elisangela Leal	EcoUrbis	(11)3397-1755	Português	CTM Carolina Maria de Jesus	
	17:30 ~ 18:30	Trabalho Prático	Sessão de reflexão	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japões/ Português	Sala de Reuniões	Feller Hotels Av. Paulista
1-Oct(Thu)	9:00 ~ 10:00	Palestra	Coleta Seletiva de Lixo	Samuel de Oliveira	Departamento de Planificação e Desenvolvimento, AMLURB	(11)3397-1755	Português	AMLURB	
	11:00 ~ 12:00	Visita de Campo	projecto-piloto de compostagem (comunidade)	Antonio Storel	Departamento de Gestão de Serviços, AMLURB	(11)3397-1777	Português	Distrito de Lapa	
	12:00 ~ 12:30	Visita de Campo	projecto-piloto de compostagem (doméstico)	Claudio Spínola	Morada da Floresta(NGO)	(11)2503-0036	Português	Distrito de Lapa	
	14:00 ~ 15:00	Visita de Campo	ECOPONTO	Odair Souza	Departamento de Planificação e Desenvolvimento, AMLURB	(11)3397-1743	Português	Distrito de Lapa	
	16:00 ~ 17:00	Visita de Campo	Limpeza das ruas e locais de descarte ilegal- ponto viciado	Evaldo Gomes/Sidinei Souza	Departamento de Gestão de Serviços, AMLURB/INOVA	(11)3397-1726	Português	Distrito de Lapa	Feller Hotels Av. Paulista
2-Oct(Fri)	9:00 ~ 10:00	Palestra	Discussão sobre gestão de contratos	José Rodriguez Vazquez/Eduard	Departamento de Gestão de Serviços, AMLURB	(11)3397-1788	Português	AMLURB	
	10:00 ~ 11:00	Palestra	Grandes Geradores de Resíduos e Autorizações/Cadastro	Adler Carvalho	Departamento de Gestão de Serviços, AMLURB	(11)3397-1726	Português	AMLURB	
	11:00 ~ 12:00	Palestra	Atividades de educação ambiental relacionado a resíduos da cidade de São Paulo	Monica Borba	Secretaria de Vegetação e Meio Ambiente (SVMA) Cidade de São Paulo	(11)3871-1944	Português	AMLURB	
	12:00 ~ 12:30	Palestra	Coleta de Resíduos e Sistemas de Monitoramento (SISCOR)	Ivan Mazzoco	Departamento de Gestão de Serviços, AMLURB	(11)3329-4858	Português	AMLURB	
	14:00 ~ 15:40	Visita de Campo	Limpeza de Feira Livre / Cata Bagulho	Helena Terzella/Sidinei Souza	Departamento de Planificação e Desenvolvimento, AMLURB/INOVA	(11)3397-1755	Português	Distrito de Sé	
	16:30 ~ 18:00	Trabalho Prático	Sessão de reflexão	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japões/ Português	Sala de Reuniões	Feller Hotels Av. Paulista

様式 2

Data	Horas	Tipo	Conteúdo	Orador/ Visita de Campo			Língua	Local	Acomodação
				Nome	Organização	Contacto			
3-Oct(Sat)	14:00 ~ 19:00		São Paulo-> Belo Horizonte	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japonês/ Português		Holiday Inn Belo Horizonte
4-Oct(Sun)	~		Dia livre						Holiday Inn Belo Horizonte
5-Oct(Mon)	10:00 ~ 10:30		Encontro Secretário de Meio Ambiente, Presidente de FEAM / Diretora da ARMBH / Assessor de Relações Internacionais MG	Renato Brandao/Diogo Franco/Rodrigo Perpétuo	Fundo do Meio Ambiente/ Agência Metropolitana de Desenvolvimento/ Departamento de Relações Internacionais, Estado de Minas Gerais.	(31)3915-1244/3915-6992	Português	ARMBH	
	10:30 ~ 11:15	Apresentação	Apresentação sobre a Gestão de resíduos na cidade de Maputo	Ferreira	Vereador do Município de Maputo	-	Português	ARMBH	
	11:15 ~ 11:30	Apresentação	Apresentação sobre maputo projeto 3R	Soeda	Nippon Koei	(11)3326-6500	Japonês/ Português	ARMBH	
	11:30 ~ 12:30	Palestra	Os projetos de gestão de resíduos da região metropolitana de Belo Horizonte	João Duarte	Fundo do Meio Ambiente, Estado de Minas Gerais	(31)3915-1244	Português	ARMBH	
	15:30 ~ 17:00	Palestra	Visão geral da gestão de resíduos cidade de Itáúna	Sérgio Cunha	Cidade de Itáúna	(37)9107-0083	Português	Itáúna	
	17:00 ~ 18:30	Visita de Campo	Atividade de reciclagem por associação de catadores em Itáúna	Sérgio Cunha	Cidade de Itáúna	(37)9107-0083	Português	Coopert	Holiday Inn Belo Horizonte
6-Oct(Tue)	9:30 ~ 10:00	Palestra	Desafios da compostagem em São Joaquim de Bicas	Fabiana Santos	Fundo do Meio Ambiente, Estado de Minas Gerais	(31)3915-1244	Português	São Joaquim de Bicas	
	10:00 ~ 10:30	Palestra	As experiências de cooperação internacional do Município de São Joaquim de Bicas para o aprimoramento da Educação Ambiental	Eliane Rodrigues Salvador	Projeto Reciclar	(31)3534-9000/7271	Português	São Joaquim de Bicas	
	10:30 ~ 11:30	Visita de Campo	A Usina de triagem e compostagem de São Joaquim de Bicas	Álida de Castro Silva	Secretária do Meio Ambiente, Cidade de, São Joaquim de Bicas	(31)3534-9000/7271	Português	São Joaquim de Bicas	
	13:30 ~ 16:30	Visita de Campo	Visita a estação de transbordo e aterro de Betim	Victor Coelho/Silvio Costa	Secretária do Meio Ambiente, Cidade de Betim/Essencis	(041 31) 3512-3161 / (041 31) 8644-7272	Português	CTR Betim	
	17:30 ~ 18:30	Palestra	Apresentação do Projeto - Promoção de Eficiência na Gestão dos Resíduos Sólidos no Brasil	Liz Lacerda/Camila Seixas	Associação para a Cooperação de Ciência e Tecnologia Brasil-Japão	(31)9194-2774/9430-5587	Português	Sala de Reuniões	
	18:30 ~ 19:30	Palestra	Gestão financeira relacionados com a gestão de resíduos	Camila Seixas	Cooperação para a Informação, Cidade de, Belo Horizonte	(31)9194-2774/9430-5587	Português	Sala de Reuniões	Holiday Inn Belo Horizonte
7-Oct(Wed)	10:30 ~ 12:30	Visita de Campo	Lixão em encerramento de Esmeraldas	Érica Gonçalves e Elvécio Rezende	Secretária do Meio Ambiente, Cidade de Esmeraldas	(31) 3522 6010	Português	Esmeraldas	
	14:30 ~ 15:30	Palestra	As ferramentas de gestão compartilhada do Estado de Minas Gerais	César Cristiano de Lima	Secretária de Planificação e Gestão, Estado de Minas Gerais	(31)3916-0827	Português	ARMBH	
	15:30 ~ 16:30	Palestra	Planos de carreira na SEMAD	Renato Alves Pereira	Secretária do Meio Ambiente, Estado de Minas Gerais	(31)3915-1659	Português	ARMBH	
	16:30 ~ 17:00	Palestra	Gestão de Resíduos Sólidos em Minas Gerais	Fabiana Santos	Secretária do Meio Ambiente, Estado de Minas Gerais	(31)3915-1244	Português	ARMBH	
	17:00 ~ 21:00		Belo Horizonte -> São Paulo	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japonês/ Português		Feller Hotels Av. Paulista
8-Oct(Thu)	9:00 ~ 10:00	Palestra	Consórcio ABC e do PPA Regional Participativo	Hamilton Lacerda	Director do Programa e do Projecto, Consórcio ABC	(11) 4435-3561	Português	Consórcio ABC	
	10:00 ~ 11:00	Palestra	Plano Regional e Sistema Integrado Regional dos Sólidos	Livia S.Rosseto	Coordenador do Programa de Gestão de Resíduos Sólidos, Consórcio ABC	(11) 4435-3558	Português	Consórcio ABC	
	11:00 ~ 12:00	Palestra	Resíduos Sólidos e Movimentos dos Catadores do ABC; Troca de Opiniões	Maria Ruth F. Takahashi	Director Executivo, Coopercent ABC	(11) 4054-2263	Português	Consórcio ABC	
	13:30 ~ 15:00	Visita de Campo	Visitas ao Aterro Sanitário Cidade São Jorge, Usina de Compostagem e Cooperativa dos Catadores	Sebastião Neyvaz	Director, SEMASA, Cidade de Santo André		Português	Santo André	
	16:30 ~ 17:30	Trabalho Prático	Sessão de reflexão	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japonês/ Português	Sala de Reuniões	Feller Hotels Av. Paulista
9-Oct(Fri)	9:00 ~ 12:00	Trabalho Prático	Preparativos para apresentação	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japonês/ Português	Sala de Reuniões	
	13:00 ~ 14:00	Trabalho Prático	Discussão para atualizar plano mestre na Cidade de Maputo	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japonês/ Português	Escritório da JICA São Paulo	
	14:00 ~ 15:30	Apresentação	Apresentação dos resultados do treinamento	Soeda/Koide/Christina	Escritório da JICA, São Paulo	-	Japonês/ Português	Escritório da JICA São Paulo	Feller Hotels Av. Paulista
10-Oct(Sat)	~		Partida de São Paulo	Soeda/Koide/Christina	Nippon Koei	(11)3326-6500	Japonês/ Português	Aeroporto de Guarulhos	

The Project for Promotion of Sustainable 3R Activities in Maputo

Third Country Training in Brazil: List of Trainees

Name	Position and Organization	Responsibility in the Project
Mr. Florentino Ferreira	Councilor for Sanitation City Council of Maputo	Project Director
Mr. Joao Mucavele	Director of DMSC City Council of Maputo	Project Manager
Ms. Luisa Bila	General Manager of Planning and Monitoring Department, DMSC City Council of Maputo	Project Coordinator
Mr. Sergio Manhique	Manager of Planning and Monitoring Department, DMSC City Council of Maputo	Counter Part (M/P, Finance and 3R)
Ms. Meriamo Stela Novela	Technician of Waste Management Department, DMSC City Council of Maputo	Counter Part (C/T and 3R)
Ms. Rute Massingue	Civic Education Office, Planning and Monitoring Department, DMSC City Council of Maputo	Counter Part (Civic Education and 3R)
Mr. Tonymingos Muioi	Procurement Technician, Department of Finance City Council of Maputo	Counter Part (Finance*)
Mr. Anselmo Inguane	Technician of Planning and Monitoring Department, DMSC City Council of Maputo	Counter Part (C/T)

* Mr. Muioi does not belong to DMSC, which is direct implementation organization of the project; however, he is in charge of procurement and contracting for waste management sector of Maputo city at its department of finance. Therefore, he was selected as a municipality officer of Maputo who is responsible for improvement of financial management for solid waste management, which is a part of the output of the project.

Appendix 6

Handed over equipments

List of Handed Over Equipment

Type of equipmanet	Number	Acquisition cost			Date of Procurement	Location of Usage	Date of handed over
		Price	Currency	Yen equivalent			
Container	1	330, 525	MZN	1, 077, 842	2015/7/6	Project Site	2016/2/29
Lap top PC 1	2	57, 790	MZN	181, 095	2015/7/10 2015/9/14	Project Site	1) 2017/2/15 2) 2017/4/28
GPS	3	110, 313	JP	110, 313	2013/3/13	Project Site	2017/2/15
Projector	1	32, 191	JP	32, 191	2013/3/13	Project Site	2017/2/15
Video camera	2	52, 952	JP	52, 952	2013/3/13	Project Site	2017/2/15
Degital Camera	2	43, 733	JP	43, 733	2013/3/12	Project Site	2017/4/28
Printer 1	1	217, 734	JP	217, 734	2013/4/4	Project Site	2017/4/28
Printer 2	1	11, 425	JP	11, 425	2013/4/1	Project Site	2017/4/28
Desk top PC	2	68, 975	JP	68, 975	2013/4/1	Project Site	2017/4/28
Lap top PC 2	3	117, 030	JP	117, 030	2013/4/1	Project Site	2017/4/28



CERTIFICADO DE ENTREGA
ENTRE
A AGÊNCIA JAPONESA DE COOPERAÇÃO INTERNACIONAL
E
O CONSELHO MUNICIPAL DA CIDADE DE MAPUTO
NO ÂMBITO DO
PROJECTO PARA PROMOÇÃO DE ACTIVIDADES SUSTENTÁVEIS DE 3R EM
MAPUTO NA REPÚBLICA DE MOÇAMBIQUE

O presente documento serve para certificar que no âmbito do Projecto acima mencionado, a Agência Japonesa de cooperação Internacional (devorante designado por JICA) procedeu a 22 de Junho de 2016, a entrega ao Conselho Municipal da Cidade de Maputo (CMCM) de **duas (2) viaturas** com as especificações constantes do anexo abaixo.

Ambas partes concordaram em tomarem as medidas necessárias visando alterar o título de propriedade das viaturas em referência da JICA para o CMCM

Ambas partes acordaram igualmente que durante o período de implementação do Projecto supracitado, o CMCM deverá permitir que os especialistas da JICA continuem fazendo uso das viaturas para as actividades do Projecto.

Durante o período de implementação do Projecto, a JICA irá cobrir as despesas resultantes do uso das viaturas, nomeadamente, despesas com combustível, pagamento de motoristas, manutenção e seguro da viatura.

Maputo, 22 de Junho de 2016



Katsuyoshi SUDO
Representante Residente
Agência Japonesa de Cooperação Internacional
Escritórios em Moçambique



Florentino Ferreira
Vereador de Salubridade e Cemitérios
Conselho Municipal da Cidade de Maputo
República de Moçambique

Testemunha



Shungo SOEDA
Assessor Líder do Projecto 3R



Anexo

Especificações da Viatura

No	Especificações	Qty
1	NISSAN, HARDBODY 2.5 TDI LWB 4X4 (K06) 2013 Matricula: ADI 687 MP	1
2	NISSAN, URVAN 2013 Matricula: ADC 116 MP	1

- Fim -



The Project for Promotion of Sustainable 3R Activities in Maputo
Japan International Cooperation Agency - Technical Cooperation Project

Office: Av. Fernão Magalhães, nº 1252 (c/o Direcção Municipal De
Gestão Dos Resíduos Sólidos Urbanos e Salubridade)
Telephone : +258-84-597-5246 E-mail: jica3rmaputo@gmail.com

Mr. Florentino Ferreira
City Councilor for Waste Management and Cemeteries
Municipal Council of Maputo

Date: 29 February, 2016

Your ref.

Our ref. LCMQM-16-012

Subject: Handover Note for Equipment for 3R Station

Dear Sir,

Hereby the Japan International Cooperation Agency (JICA) Mozambique Office hands over the equipment listed in Attachment to the Municipal Directorate for Solid Waste Management and Cemeteries (DMSC) of Municipal Council of Maputo (CMM), described on Certificate attached hereto.

The equipment had been used for the Pilot Project of 3R Station in Zimpeto Bairro implemented under the technical cooperation project of JICA called "The Project for Promotion of Sustainable 3R Activities in Maputo".

This pilot project had conducted the valuable recyclables collection by using the equipment since September 2015, under DMSC's responsibility with participation of local residents, a microenterprise and a NGO, technically supported by JICA Expert Team. Since the operation of 3R Station ends as a pilot project in February 2016, the equipment are transferred to CMM.

Kindly acknowledge receipt of the equipment by signing the two of the attached Certificate and returning one copy to JICA Expert Team, on behalf of JICA Mozambique Office.

We would appreciate for your understanding and cooperation.

Yours Sincerely,



Attachment: List of Equipment

CC: JICA Mozambique Office
DMSC



The Project for Promotion of Sustainable 3R Activities in Maputo
Japan International Cooperation Agency - Technical Cooperation Project

Office: Av. Fernão Magalhães, nº 1252 (c/o Direcção Municipal De
Gestão Dos Resíduos Sólidos Urbanos e Salubridade)
Telephone : +258-84-597-5246 E-mail: jica3rmaputo@gmail.com

Attachment

Certificate of Handover

**Name of Project: The Project for Promotion of Sustainable 3R Activities in
Maputo**

Date of Handover: 29 February, 2016

	Items	Qty	Location
1	20GP Container Material: Steel, Size: 2.6m H x 6m L x 2.5m W	1	Quarter No. 68, Zimpeto Bairro

※ It is accepted that the possession of the Equipment is on an as is basis.

We agree that CMM takes all appropriate measures to ensure that the equipment so provided are safely stored, properly maintained and used for the purpose of re-open of 3R Station under its responsibility and an appropriate operation manner.

By: 
Mr. Shungo SOEDA
Chief Advisor

JICA Expert Team

By: 
Mr. Florentino Ferreira
City Councilor for Waste Management
and Cemeteries
Municipal Council of Maputo



The Project for Promotion of Sustainable 3R Activities in Maputo
Japan International Cooperation Agency - Technical Cooperation Project

Office: Av. Fernão Magalhães, nº 1252 (c/o Direção Municipal De
Gestão Dos Resíduos Sólidos Urbanos e Salubridade)
Telephone : +258-84-597-5246 E-mail: jica3rmaputo@gmail.com

Mr. Florentino Ferreira
City Councilor for Waste Management and Cemeteries
Municipal Council of Maputo

Date: 10 February, 2017

Your ref.

Our ref. LCMQM-17-001

Subject: Handover Note for Equipment

Dear Sir

Hereby the Japan International Cooperation Agency (JICA) Mozambique Office hands over the equipment listed in Attachment to the Municipal Directorate for Solid Waste Management and Cemeteries (DMSC) of Municipal Council of Maputo (CMM), described on Certificate attached hereto.

The equipment had been used for project activities of "The Project for Promotion of Sustainable 3R Activities in Maputo".

Kindly acknowledge receipt of the equipment by signing the two of the attached Certificate and returning one copy to JICA Expert Team, on behalf of JICA Mozambique Office.

As for two project cars, both cars were already handed over to CMM by JICA Mozambique Office on 22th June 2016, changing owner's name. However, JICA expert team has been allowed to use these cars for the project activities up to now. Thanks to your understanding, it is pleasure for us to inform you that one of these cars, NISSAN HARDBODY, would be transferred from JICA expert team to CMM on 10 February 2017.

Therefore, CMM shall be responsible for all the necessary expenses for NISSAN HARDBODY such as gasoline, employment of driver, car insurance, maintenance and repairing of the vehicle

JICA expert team will continue using the NISSAN URVAN for the project activities until the end of the project period (scheduled by the end of April 2017).

We would appreciate for your understanding and cooperation.

Yours Sincerely,

Shungo SOEDA

Chief Advisor

JICA Expert Team

Attachment: List of Equipment

CC: JICA Mozambique Office
DMSC

Recebemos
Faustino Tifos Soisam
Elisa Adelaide Magalhães Guernade



Projecto para a Promoção de Actividades Sustentáveis de 3R em Maputo
Agência Japonesa de Cooperação Internacional – Projecto de Cooperação Técnica

Office: Av. Fernão Magalhães, nº 1252 (c/o Direcção Municipal De
Gestão Dos Resíduos Sólidos Urbanos e Salubridade)

Telephone : +258-84-597-5246 E-mail: jica3rmaputo@gmail.com

Maputo, February 10, 2017

Dear Sir

Property Department

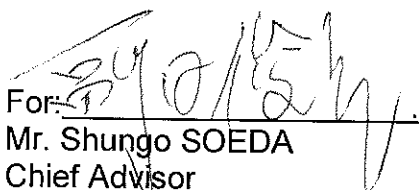
CMM

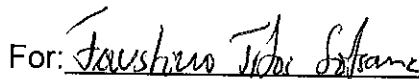
Maputo

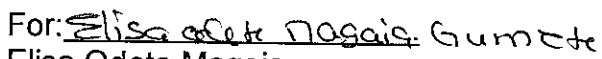
We hereby, hand over the material described below regarding which we agreed that CMM, shall take all necessary measures to ensure that the equipment is kept safely, and properly maintained and used for CMM activities.

The equipment shall be handed over as is.

	Items	Qtd.
1	Global Positioning System (GPS)	3
2	Laptop	1
3	Camera	2
4	Projector	1

For: 
Mr. Shungo SOEDA
Chief Advisor

For: 
Faustino Ttos Sotsane

For: 
Elisa Odete Magaia
Maputo Municipal Council
Procurement Department



The Project for Promotion of Sustainable 3R Activities in Maputo
Japan International Cooperation Agency - Technical Cooperation Project

Office: Av. Fernão Magalhães, n° 1252 (c/o Direção Municipal De
Gestão Dos Resíduos Sólidos Urbanos e Salubridade)

Telephone : +258-84-597-5246 E-mail: jica3rmaputo@gmail.com

Mr. Florentino Ferreira
City Councilor for Waste Management and Cemeteries
Municipal Council of Maputo

Date: 28 April, 2017

Your ref.

Our ref. LCMQM-17-002

Subject: Handover Note for Equipment

Dear Sir

Hereby the Japan International Cooperation Agency (JICA) Mozambique Office hands over the equipment listed in Attachment to the Municipal Directorate for Solid Waste Management and Cemeteries (DMSC) of Municipal Council of Maputo (CMM), described on Certificate attached hereto.

The equipment had been used for project activities of "The Project for Promotion of Sustainable 3R Activities in Maputo".

Kindly acknowledge receipt of the equipment by signing the two of the attached Certificate and returning one copy to JICA Expert Team, on behalf of JICA Mozambique Office.

As for two project cars, both cars were already handed over to CMM by JICA Mozambique Office on 22th June 2016, changing owner's name. And, one of these cars, NISSAN HARDBODY, was transferred from JICA expert team to CMM on 10 February 2017, together with other equipment as testified by the attached acceptance note. It is pleasure for us to inform you that the other car, NISSAN URVAN would be transferred from JICA expert team to CMM on 28 April 2017.

Therefore, CMM shall be responsible for all the necessary expenses for NISSAN URVAN such as gasoline, employment of driver, car insurance, maintenance and repairing of the vehicle

We would appreciate for your understanding and cooperation.

Yours Sincerely,


Shungo SOEDA
Chief Advisor
JICA Expert Team





The Project for Promotion of Sustainable 3R Activities in Maputo
Japan International Cooperation Agency - Technical Cooperation Project

Office: Av. Fernão Magalhães, nº 1252 (c/o Direção Municipal De
Gestão Dos Resíduos Sólidos Urbanos e Salubridade)

Telephone : +258-84-597-5246 E-mail: jica3rmaputo@gmail.com

Attachment: List of Equipment

CC: JICA Mozambique Office
DMSC

Attachment

Certificate of Handover

**Name of Project: The Project for Promotion of Sustainable 3R Activities in
Maputo**

Date of Handover: 28 April, 2017

	Items	Qty
1	Digital camera	2
2	Laptop personal computer	4
3	Printer	2
4	Desktop personal computer	2

※ It is accepted that the possession of the Equipment is on an as is basis.

We agree that CMM takes all appropriate measures to ensure that the equipment so provided are safely stored, properly maintained and used for the jobs of CMM.

By: 
Mr. Shungo SOEDA
Chief Advisor

JICA Expert Team

By: 
Mr. Florentino Ferreira
City Councilor for Waste Management
and Cemeteries
Municipal Council of Maputo

Appendix 7

Joint Coordination Committee

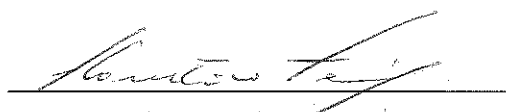
MINUTES
ON
THE FIRST JOINT COORDINATION COMMITTEE
FOR
THE PROJECT FOR PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
IN THE REPUBLIC OF MOZAMBIQUE

The first Joint Coordination Committee Meeting (hereinafter referred to as "JCC") was held on April 1, 2013 at the meeting room of the Municipal Department of Urban Solid Waste Management and Sanitation (hereinafter referred to as "DMGRSUM") of the Municipal Council of Maputo (hereinafter referred to as "CMM"), inviting the Mayor of CMM and the representative resident of Mozambique Office of the Japan International Cooperation Agency (hereinafter referred to as "JICA").

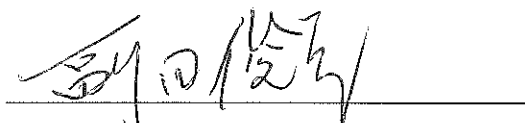
The purpose of the 1st JCC was to introduce activities under the Project for Promoting of Sustainable 3R Activities in Maputo (hereinafter referred to as "the Project") with the work plan to the related organizations. In addition, the Mozambican counterparts (hereinafter referred to as "the C/P") were also appointed officially to the Project, as well as the introduction of the member of JICA expert team (hereinafter referred to as "JET") who participated in the 1st JCC.

As a result of the 1st JCC, both the Maputo side and JET side (hereinafter referred to as "both sides") agreed to the matters in the document attached hereto.

Maputo, April 10th, 2013



Mr. Florentino Ferreira
Councilor for Waste Management
Municipal Council of Maputo



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Presentation of the Project

A chief advisor of the Project, Mr. Shungo SOEDA, briefly presented the Project as follows.

- Background of the Project
- Implementation Structure
- Outline of the Project
- Summary of Project Design Matrix (PDM)
- Project Schedule
- Undertakings of CMM

Prior to the above introduction, the basic policy of 3R (Reduce, Reuse and Recycling) was also explained by the chief advisor.

2. Implementation Structure and Mozambican C/P

Implementation structure consists of the JCC and the Project team was confirmed as shown below.

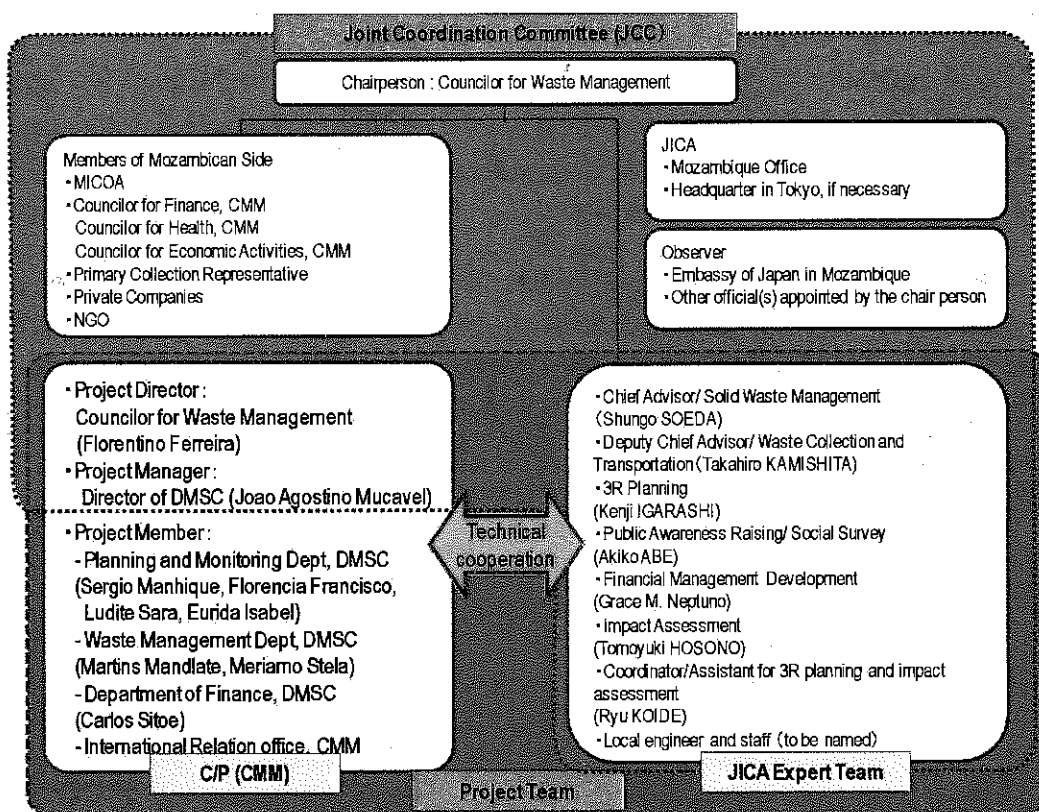


Figure Implementation Structure of the Project

The JCC will be chaired by the councilor for solid waste management of CMM with the representatives of relevant organizations. Private companies and NGOs will also be able to participate in the JCC as the member because the cooperation with such private sectors is very effective for CMM to improve the solid waste management situations.

As shown in Figure, it was officially agreed that the following members of DMGRSUS were selected as the main C/P for the Project. It was also agreed that DMGRSUS will appoint other staff as the sub-C/P in case the Project activities will be beyond the capacity of these main C/P.

Table List of Main Mozambican C/P for the Project

Position	Name	Department
Project Director	Florentino Ferreira	Councilor of solid waste management
Project Manager	Joao Agostino Mucavel	Director of DMGRSUS
Project Coordinator	Luisa Langa Bila	Head of Planning and Monitoring Dept.
Main C/P	Sergio Manhique	Planning and Monitoring Dept.
	Florencia Francisco	Ditto
	Ludite Sara	Ditto
	Eurida Isabel	Ditto
	Martins Mandlate	Waste Management Dept.
	Meriamo Stela	Ditto
	Carlos Siteo	Finance Dept.

Main functions of the JCC were also officially confirmed as shown below.

- To formulate the annual operational work plan of the Project according to the PDM and the Plan of Operation (PO),
- To review the overall progress and achievements of the Project,
- To examine major issues arising from or in connection with the Project,
- To work out the modification of activities depending on the necessity, and
- To ensure smooth implementation of the Project and secure inter-organizational coordination, guidance and supervision.

3. Project Design Matrix (PDM)

A chief advisor explained that the PDM is commonly used in Japanese technical cooperation in order to manage and implement projects efficiently and effectively. It will also be as a reference for monitoring and evaluating the Project.

All participants understood the overall goal, project purpose and four outputs expected to be obtained in the Project as follows, as well as the activities under each output.

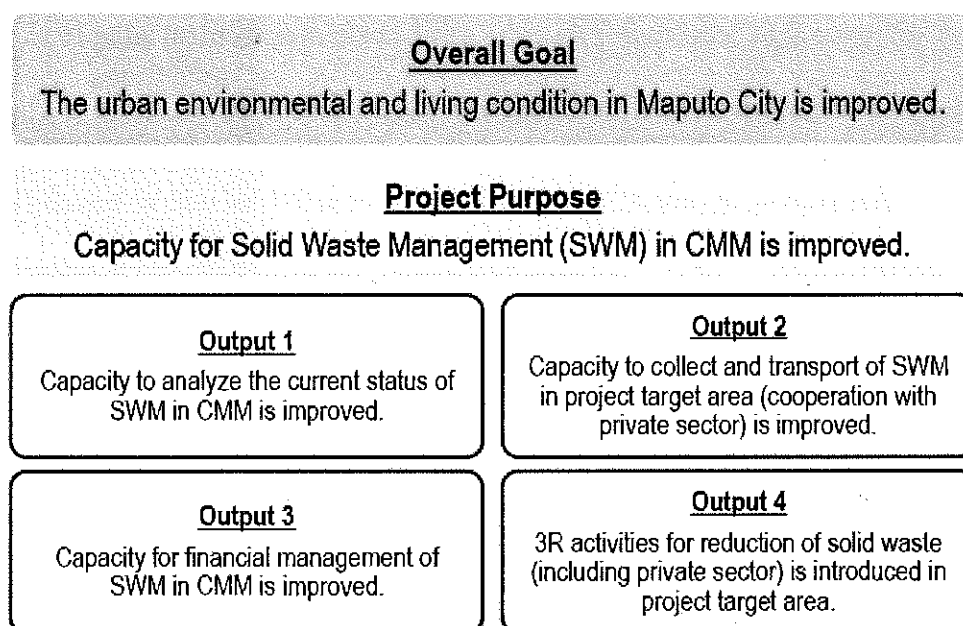


Figure Overall goal, project purpose and outputs under PDM

In addition, it was explained that the PDM is to be flexibly revised according to the progress and achievements of the Project, upon approval by the JCC.

4. Duration and Schedule of the Project

All participants confirmed that the duration of the Project would be 4 years from March 2013 to March 2017.

It was reported that the Work Plan for the first year prepared by JET had been already discussed with the C/P of DMGRSUS since the project started in March 2013 and the contents of the Work Plan was agreed between DMGRSUS and JET.

5. Undertaking of CMM

Undertaking of CMM which was agreed in the Record of Discussions on the Project between CMM and JICA on November 27, 2012, was again explained and reconfirmed as follows.

CMM will take necessary measures to:

- ensure that the technologies and knowledge acquired by CMM as a result of technical cooperation contributes to the economic and social development of Maputo

City, and that the knowledge and experience acquired by the personnel of CMM from technical training as well as the equipment provided will be utilized effectively in the implementation of the Project; and

- ensure that customs duties, internal taxes and other fiscal levies which may be imposed to the Project with respect to the purchase of the products and the services be borne by CMM as long as duly has been done by the respective budget.

6. Comments

The representative residence of JICA Mozambique Office stated three points of the Japanese cooperation for the Project as follows.

Collaboration of active participation of the C/P to the Project and the appropriate technology transfer from JET is very important to achieve the self-sustainable solid waste management with the ownership of DMGRSUS.

Involvement of the private sectors and citizens of the city of Maputo is also crucial to implement the Project.

Visual result or presentations of the activities are expected to be shown to the public so that citizens can understand the Project to support DMGRSUS more.

Honorable Mayor of the CMM welcomed that the Project which would contribute the improvement of solid waste management in Maputo which is very challenging activities had started. Especially, he mentioned about the importance of the communication among citizens, communities and CMM to secure the financial sustainability of the solid waste management activities.

Appendix I

List of Attendants

Participants from Mozambican side

CMM

Mr. David Simango	Mayor
Mr. Flotentino Ferreira	Councilor of solid waste management

DMGRSUS, CMM

Mr. Joao Agostino Mucavel	Director
Sra. Luisa Langa Bila	Department of Planning and Monitoring
Sr. Sergio Manhique	Department of Planning and Monitoring
Sra. Florencia Martins	Department of Planning and Monitoring
Ms. Euridia Isabel César Sithoy	Department of Planning and Monitoring
Sra. Stela Martins	Department of Solid Waste Management
Sr. Martins Madlate	Department of Solid Waste Management
Sr. Carlos Siteo	Department of Finance

Participants from Japanese side

JICA Expert Team

Mr. Shungo Socda	Chief Advisor
Mr. Takahiro Kamishita	Deputy Chief Advisor
Ms. Akiko Abe	Public Awareness Raising/ Social Survey
Mr. Ryu Koide	Project Coordinator/ Support of 3R and Impact Evaluation
Sra. Uitnei Chamusso	Translator
Sra. Ilenio Mate	Translator
Sr. Leonel Simango	Technical Assistant
Sr. Geraldo Saranga	Technical Assistant
Sr. Rogerio Mole	Technical Assistant

JICA Mozambique Office

Mr. Ryuichi Nasu	Representative Resident of JICA Mozambique Office
Mr. Ryosuke Nakase	Representative of JICA Mozambique Office

**MINUTES
ON
THE SECOND JOINT COORDINATION COMMITTEE
FOR
THE PROJECT FOR PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
IN THE REPUBLIC OF MOZAMBIQUE**

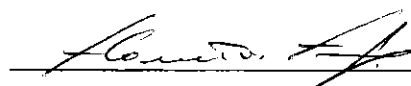
The second Joint Coordination Committee Meeting (hereinafter referred to as “JCC”) was held on July 31, 2013 at the meeting room of the Municipal Department of Urban Solid Waste Management and Sanitation (hereinafter referred to as “DMGRSUM”) of the Municipal Council of Maputo (hereinafter referred to as “CMM”), inviting the representative of the Embassy of Japan as an observer.

The purpose of the 2nd JCC was to report the progress of the activities of the Project for Promoting of Sustainable 3R Activities in Maputo (hereinafter referred to as “the Project”), consisting of preliminary review result of the current conditions, progress of capacity survey, the first review result of the Project Design Matrix (PDM), and draft capacity plan.

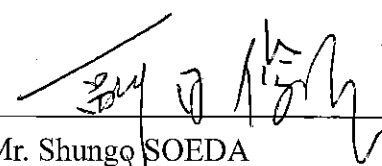
Upon the ownership of the Mozambican counterparts (the C/P), most of the presentation was done by the C/P.

As a result of the 2nd JCC, both the Maputo side and JICA expert team (hereinafter referred to as “JET”) side confirmed the progress of the project in the document attached hereto.

Maputo, August 2nd, 2013



Mr. Florentino Ferreira
Councilor for Waste Management
Municipal Council of Maputo



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Summary of the Progress of the Project

A chief advisor of the Project, Mr. Shungo SOEDA, briefly presented the progress of the Project started from March 2013.

During this time, six activity groups were formulated for each output designated in the PDM. Each group consist at least two JICA experts and few C/Ps. This implementation chart with the photo of each participant were prepared and displayed on the wall of DMGRSUS. After that, conducted or conducting activities were explained.

2. Preliminary Review Result of Current Situations in the M/P 2007

Mr. Sergio Manhique of DMGRSUS introduced the progress of the review of Chapter 4 of the existing M/P prepared in 2007, which is the current condition.

Chapter 4 is divided into the following eight sections. For each section, discrepancies between the M/P and the current situation, additional information to be collected, and necessary exams and studies for the updating of the M/P, were explained as the preliminary result of the discussions among the C/P and JET.

4.1 Organizational Structure of RSU

- Name of DMGRSUS and its organizational chart were changed.

4.2 Budget and Financial Management

- Current revenues for solid waste management such as cleaning tax and other external financial sources were explained.

4.3 RSU Collection and Transportation

- Latest situations of waste collection and transportation at both urban and suburban area, which had been extended widely since 2007 were explained.

4.4 Treatment and Final Disposal

- While waste quantity disposed of at Hulene dumping site increased up to around 850 tons per day, some problem on the operation of dumping site were pointed out.

4.5 Private Sector Participation

- Previously, the private sector played a small role in USWM in Maputo. Currently, several private companies and NGOs exist in Maputo, providing their solid waste collection and transportation services or recyclable collection.

4.6 Recycling Activities

- When the existing M/P was prepared in 2007, only a few recycling activities were just started. Currently more organizations participate in the recycling activity.

4.7 Civic Education and Others

- After civic education programs conducted in the past were shared, current issues on the civic education like lack of strategic approach were pointed out.

4.8 Problem Analysis and Monitoring Indicators

- As one of the review result of monitoring indicator, current waste flow was summarized.

3. Preliminary Result of Capacity Survey

Member of the C/P from Planning and Monitoring Department of DMGRSUS, who are Mr. Anselmo Inguane, Ms. Luisa Bila and Ms. Euridia Isabel, introduced the preliminary result of the following capacity surveys.

1. Waste Quantity and Quality Survey

- Survey was conducted from June to July in dry season. The result of unit generation rate and physical waste composition were preliminary summarized by the different generation sources, in addition to the explanation of survey method.

2. Time and Motion Survey

- Survey was conducted from June to July in dry season on selected 10 waste collection route in both urban and suburban area. The result of survey that stopping time for waste collection and moving time for transportation were explained.

3. Social Survey

- Survey was conducted from May to July at household, businesses, NGOs and waste pickers. Of which, preliminary result of household survey was introduced such as the satisfaction level of citizens for municipal solid waste management services.

4. Situational Survey

- Since the survey started in May is still undergoing, objective, methods and the progress were explained. As one of the result of survey, the list of laws and regulations related to solid waste management was shared.

4. Review of Indicators of PDM

Ms. Ludite Sara, one of the C/P, made a presentation of the preliminary review result of the PDM, especially focusing on the indicators.

Objectively Verifiable Indicators and Means of Verification in the PDM were reviewed jointly by the C/P and JET. Most of those were clearly or basically understood by the C/P but it was proposed some should be modified to more practical indicators.

Especially, indicators for Output 3, which is the improvement of financial management capacity, shall be modified based on more discussions among the concerned with

understanding the current situations, which are to be measured by certain timeline.

For example, “revenue baseline data”, “department budget plan” and “variance between budget execution and budget plan” can be indicators.

5. Draft Capacity Development Plan

Mr. Shungo Soeda, Chief Advisor, again explained about the draft capacity development plan.

In order to grasp the current capacity of each C/P, individual interviews between the C/P and JET were conducted twice. First interview focused to understand the profile of each C/P, as well as the recognition of the C/P on the solid waste management problems. At the second interview, experienced field related to the solid waste management was examined.

Results of those interviews was summarized tentatively in the radar chart to find the strong points and weak points of each C/P.

6. Future Activity Schedule

Mr. Martins Mandlate from the Waste Management Department of DGGRSUS explained about the future activity schedule in the first year of Project up to March 2013.

For the activity of Output 1, the existing M/P will be updated based on the review result by the C/P with JET’s support.

For the activity of Output 2, pilot project for the improvement of waste collection and transportation which will be conducted in the second year will be designed based on the current situations.

For the activity of Output 3, it will be tried to enter the financial data and calculate annual budget and monthly expense, continuing collecting periodical data on tax-and-spend of wastes every month.

7. Comments

After the presentations, a few comments were given by the participants. One of those was that positive attitude of the C/P on the Project should contribute to improve their capacity.

Other comment mentioned that grasping and analyzing the current conditions were very important to consider updating the existing M/P appropriately.

Appendix I

List of Attendants

Participants from Mozambican side

CMM

Mr. Flotentino Ferreira	Councilor of solid waste management
-------------------------	-------------------------------------

DMGRSUS, CMM

Mr. Joao Agostino Mucavel	Director
Ms. Luisa Langa Bila	Department of Planning and Monitoring
Mr. Sergio Manhique	Department of Planning and Monitoring
Ms. Florencia Francisco	Department of Planning and Monitoring
Ms. Euridia Isabel César Sithoy	Department of Planning and Monitoring
Sra. Stela Martins	Department of Waste Management
Sr. Martins Mandlate	Department of Waste Management
Sr. Carlos Siteo	Department of Finance

Participants from Japanese side

JICA Expert Team

Mr. Shungo Soeda	Chief Advisor
Mr. Takahiro Kamishita	Deputy Chief Advisor
Ms. Akiko Abe	Public Awareness Raising/ Social Survey
Ms. Uitnei Chamusso	Translator
Mr. Ilenio Mate	Translator
Mr. Leonel Simango	Technical Assistant
Mr. Geraldo Saranga	Technical Assistant
Mr. Rogerio Mole	Technical Assistant

JICA Mozambique Office

Mr. Akihiro Miyazaki	Duputy Representative Resident of JICA Mozambique Office
Mr. Ryosuke Nakase	Representative of JICA Mozambique Office

**MINUTES MEETING
ON
THE THIRD JOINT COORDINATION COMMITTEE
FOR
THE PROJECT FOR PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
IN THE REPUBLIC OF MOZAMBIQUE**

The 3rd Joint Coordination Committee Meeting (hereinafter referred to as “JCC”) was held on June 9, 2014 at the meeting room of the Municipal Directorate of Urban Solid Waste Management and Salubrity (hereinafter referred to as “DMGRSUS”) of the Municipal Council of Maputo (hereinafter referred to as “CMM”). Participants were the City Councilor for Waste Management as the chairman, Deputy Resident Representative of JICA Mozambique Office, FUNAB’s Managing Director, and representatives from different institutions such as NGOs, Private Haulers, Micro Enterprises and Chamanculo D Bairro, together with concerned staff of DMGRSUS and JICA expert team (hereinafter referred to as “JET”). The representative of the Embassy of Japan was also attending to the meeting as an observer.

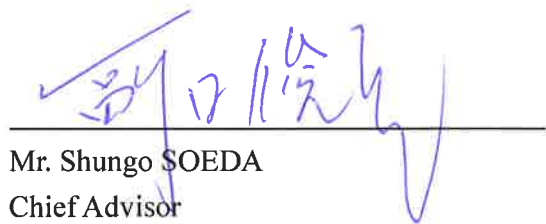
The purpose of the 3rd JCC was firstly to report the progress of activities conducted during the first year of the Project for Promoting of Sustainable 3R Activities in Maputo (hereinafter referred to as “the Project”), including the proposed action plan. As for second purpose, the proposal on revising the Project Design Matrix (PDM) and the draft Work Plan of second year’s activities were confirmed, discussed and approved.

As a result of the 3rd JCC, both the Maputo side and JICA expert team side confirmed the progress of the project and approved the revised PDM and Work Plan of second year’s activity in the document attached hereto.

Maputo, July 1st, 2014



Mr. Florentino Ferreira
City Councilor for Waste Management
Municipal Council of Maputo



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Opening interventions

At the beginning of the JCC meeting, Ms. Chiharu Morita gave her opening intervention, explaining that the purpose of the meeting was to evaluate the activities conducted and the results achieved during the first year of the Project. She also thanked all the contributions, direct and indirect, for the success of the first year of the project. Briefly, she mentioned that, for this second year, some pilot projects will be implemented with the objective of promoting 3R. Finally, she emphasized JICA's availability to support the Mozambican government in the promotion of a sustainable development.

The JCC chairman, Mr. Florentino Ferreira who is the City Councilor for Waste Management, mentioned that the support and cooperation from JICA resulted in the implementation of this project since last year because CMM had been facing challenges to improve solid waste management in the municipality. The chairman also said that the experiences of Mozambican counterparts including participating in the field surveys such as situational, social, waste quantity and quality, and time and motion surveys conducted during the first year should contribute to change the residents' behavior on the appropriate waste disposal and 3R promotion. He thanked again for the cooperation and stressed the full availability to cooperate for a better execution of the Project.

2. Report of the first year's progress including the proposed action plan

Mr. Sergio Manhique of DMGRSUS presented the summary of the progress report of the first year of activities. After that, Ms. Luisa Bila made the presentation on the proposed action plan.

In the Q&A session after these two presentations, following comments and questions were raised from the participants.

1) Sharing the detail result of activities and surveys

A comment from the head of the workshop section of DMGRSUS was that it was necessary for the project team to share more detail results of the activities so that any other staff of DMGRSUS than the counterparts who were directly involved in the Project can grasp the progress of project.

A representative of NGO, KUWUKA, also mentioned same because they had expected to have more detail information on the result of activities and surveys including the latest legal framework on the solid waste management at the JCC meeting. He also

pointed out that there were some missing information related to civic educations, public hearing to residents and businesses, or other activities currently conducted by NGOs and cooperatives.

In addition, the head of the Administration and Finances Department of DMGRSUS mentioned that the name of local consultant who conducted the surveys should be disclosed to other staff of DMGRSUS. Furthermore, another staff of DMGRSUS requested to share the contents of trainings in Japan conducted in the first year. He also would like to know some aspects carried out in the Project such as the involvement of waste pickers.

2) Financial Management Situations at DMGRSUS

The head of the Administration and Finances Department of DMGRSUS again explained that almost all budget regarding solid waste management was developed at CMM central level, not directly under the responsibility of DMGRSUS, due to the current centralized system. Therefore, he proposed to invite the Municipal Director of Finances to share the result of project activities.

Corresponding to above, Mr. Sergio Manhique responded first about the principle of JCC meeting that only remarkable summary of the project progress could be reported due to the time limitation and all details asked today were included in the progress report. He suggested having other occasion to share those details within DMGRSUS. In addition, the chairman of JCC meeting expressed his idea that the contents and presentation methods will be carefully discussed and determined from the next JCC based on the comments. Regarding the member of JCC, the chairman explained that other City Councilors including the City Councilor for finance were already assigned as the JCC members. Actually, invitation letter was sent to all those concerned City Councilors and it was expected someone from CMM related to financial matter such as City Councilor or Municipal Director of Finances to participate in the JCC meeting but they could not make it due to their own schedule.

He informed that, clearly the finances were centralized and CMM had been increasing, with other sources, the funding for waste management. It was approved recently that the commissioning charge to Cleansing Tax (Taxa de Limpeza) collected by EDM should be deducted from 15% to 5% so that the revenue of the DMGRSUS could increase.

Mr. Manhique responded about the action plan for financial management improvement that the tasks performed by the staff from the finance and administration section and the linkages with other sections should be strengthened through the updated master plan

because this section should be crucially core of DMGRSUS.

Regarding to the training in Japan, the chairman explained that, if anyone looked at pictures of Japan taken 30 years ago, the waste situation of Japan at those time was similar to the current waste situation in Maputo. However, it could not be necessary for CMM to wait for another 30 years to bring changes because these changes should be speedier with the new technologies and experiences of other developed countries. Those changes should be also caused through the residents' behavioral change.

3. Proposed modification of PDM and PO, the draft Work Plan of second year's activities

Mr. Shungo Soeda, Chief Advisor of the project team, made two presentations, the first one was the proposed modification of PDM including Plan of Operation (PO), and another one is the work plan for activities in the second year of the Project.

In the Q&A session after these presentations, following comments were raised from the participants but no crucial comments to be necessary to change the proposed modification of PDM and draft work plan.

1) Recycling Market

Representative of NGO, KUWUKA, suggested that whenever the Project worked on segregation and recycling it should be also considered the recycling market because currently there were not so many recycling entities. Without having the enough market for the recyclables collected separately from other waste, it could not be meaningful for both CMM and residents to segregate.

2) Pilot Project at Chamanculo D for source separation

The City Councilor explained about his concern to the pilot project to be conducted in Chamanculo D bairro that the residents seemed not to understand the purpose of the introduction of source separation, even the newly appointed Councilor for Chamanculo Municipal District and the consultative council were aware of the project. To this concern, the Permanent Secretary of the Chamanculo D said that the residents are reluctant to segregate and give their recyclables to the micro enterprise who collect the waste in the Bairro, ACADEC.

Ms. Meriamo Stela, the DMGRSUS's counterpart for the Project, explained the progress that there were some problems at the beginning, however clarification meetings were conducted and another option for the residents was added to the pilot project that if the residents bring their recyclables to the eco-point by them they would get some direct benefits instead of entrusting ACADEC to collect the recyclables.

Dr. Carlos Seventine, Director of FUNAB advised from his experience of the similar

project in Chamaculo C, Quarter 16, to work with NGO who has know-how of eco-point operation because the identification of available land for the eco-point was very difficult.

Corresponding to above, Mr. Soeda answered that of course the existing recycling market should be considered when the pilot project for 3R promotion would be designed based on the result of surveys on current recycling situations conducted in the first year. This kind of recycling information will be updated occasionally through the 3R workshop conducted under the Project every three months. Actually, target recyclables to be separated in Chamanculo D were selected by that result of market survey.

Mr. Soeda also said that the pilot project in Chamancuo D was still at planning stage for the implementation and any comments given at the JCC meeting would be considered to finalize the project component. However, he also reminded the participants that the pilot project should just be the trial practice to learn the lessons to be reflected to the updated master plan.

4. Closing Comments

Dr. Carlos Seventine, Director of FUNAB mentioned that it would be necessary to change people's mindsets, because they are not only waste generators but they are also responsible for their waste. He stressed FUNAB could cooperate with the Project, exchanging related information regarding solid waste management.

Mr. Itsuroh Abe, representative of the Embassy of Japan, expressed his expectation on capacity development through the Project so that Japan's bad experience of inappropriate solid waste management would not be replicated in Mozambique as much as possible.

Ms. Chiharu Morita, JICA's Deputy Resident Representative thanked for the presentation and mentioned that the JCC set up helps in the project implementation.

Mr. Shungo Soeda, Chief Advisor of the project team, stressed again that all people should realize the importance of waste reduction. Considering the increased cost for operation of new sanitary landfill in Matola and transportation from Mauto to Matola, and future termination of external fund which is PROMAPUTO for solid waste management, the financial responsibility of residents and businesses will be definitely imposed more than now if any waste reduction would be achieved.

As for closing remarks, Mr. Florentino Ferreira, the City Councilor thanked for the participation of all. He said that he was pleased with the work conducted by JICA, however

he mentioned that the residents are conservative and it is necessary to help the JICA experts to understand this. The City Councilor added that as for the storage space for recyclables, it is necessary to approach the Municipal Directorate of Infrastructures so that this Directorate can help in the identification of an appropriate space in that area.

Finally, he expressed his full commitment for the success of the project with the approval on the work plan and modified PDM.

Note:

After the 3rd JCC meeting, JICA expert team reported the result of the meeting to JICA Headquarters and the followings were discussed and determined. These were explained to the JCC chairman and agreed each other.

- 1) 4th JCC meeting will be held in November 2014 because JICA will dispatch the Mid-Term Evaluation Mission in November.
- 2) Overall goal of PDM will not be changed in the official English version, but the translation in the Portuguese version will be modified to avoid misunderstanding the meaning.

Appendix I

List of Participants

Participants from the Mozambican Side

CMM

Mr. Florentino Ferreira

City Councilor for Waste Management and
Cemeteries

Matola Municipal Council

Mr. Victorino

Matola Municipal Council

DMGRSUS, CMM

Mrs. Luisa Langa Bila

Planning and Monitoring Department

Mr. Sérgio Manhique

Planning and Monitoring Department

Mr. Anselmo Inguane

Planning and Monitoring Department

Ms. Euridia Isabel César Sithoy

Planning and Monitoring Department

Ms. Rosa Paula

Administration and Finance Section

Mr. Ibrahim Caroja

Planning and Monitoring Department

Mr. Zefanias Langa

DMGRSUS

Mr. António Chaúque

Planning and Monitoring Department

Mr. Horácio

DMGRSUS

Mr. Domingos P. Chivambo

Solid Waste Management Department

Mr. Mário Manjate

DMGRSUS

Mr. Siteo Carlos

Administration and Finance Section

Mr. António Ferreira

Administration and Finance Department

Mr. Martins Mandlate

Solid Waste Management Department

NGOs, Microenterprises, Associations, etc

Mrs. Isabel Bila

Permanent Secretary of Chamanculo D

Mrs. Tânia Libanze

KUWUKA JDA Representative

Mr. Alvaro Gil

EcoLife Representative

Mr. Carlos Seventine

Director of the FUNAB (Environmental Fund)

Mr. Armindo Buque

SERLIMPES, Lda Representative

Mr. Raimundo Manjate

KM Representative

Mr. Alexandre Nhantumbo

D.S.C

Mr. Adriano dos Santos

ACADEC Representative

Mrs. Yasmin Leuleu	LVIA Representative
Mr. Camilo Nhancale	KUWUKA JDA Representative
Mr. João Firmino	EcoLife Representative
Mr. Alberto Simbine	AMMEPS Representative
Mr. Oliveira Rodrigues	AMMEPS Representative

Participants from the Japanese Side

JICA Expert Team

Mr. Shungo Soeda	Chief Advisor
Mr. Takahiro Kamishita	Team Expert
Mr. Tomoyuki Hosono	Team Expert
Mr. Ryu Koide	Team Expert
Mr. Geraldo Saranga	Technical Assistant
Mr. Rogério Mole	Technical Assistant
Mr. Ilénio Mate	Translator/ Interpreter

JICA Mozambique Office and Japan Embassy

Mr. Itsuroh Abe	Representative of Japan Embassy
Ms. Chiharu Morita	Deputy Resident Representative, JICA
Ms. Megumi Tsukizoe	Assistant of Resident Representative, JICA
Mr. Stélio Massuque	Program Officer, JICA

Project Design Matrix (PDM)

Project Title: The Project for Promotion of Sustainable 3R Activities in Maputo

Duration of the Project: 4 years

Target Group: Municipal Council of Maputo (CMM) and people living in Maputo City

Target Area: Maputo City (excluding Katembe and Kanyaka)

Version 2.0

Date: 1 July 2014

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal			
The urban environmental and living condition in Maputo City is improved.	1) Amount of inadequate waste disposal is decreased. -> Definition of "inadequate waste disposal" will be discussed and determined when the M/P would be updated in 2017. 2) Amount of final waste disposal per person is decreased.	1,2) Report of CMM -> Clear contents of the report shall be discussed during the project.	
Project Purpose			
Capacity for Solid Waste Management (SWM) in CMM is improved.	1) The M/P for post-termination of the Project is approved by CMM. 2) XX (number) components of 3R system are proposed in Maputo City. ->Definition of "3R system" shall be discussed and determined during the project. 3) A guideline of SWM for Maputo City, a draft of M/P for post-termination of the Project, the Action Plan toward 2021 are developed.	1) Minutes of Municipal Council (Approval of M/P) 2) Project Report	<ul style="list-style-type: none"> The current policies and laws for SWM in Maputo City will not change drastically. The CMM will secure the enough budget to continue the activities proposed in the Project.
Outputs			
1. Capacity to analyze the current status of SWM in CMM is improved.	1) CMM understands progress and differences of the current M/P. 2) CMM understands public perception about SWM.	1) Updated M/P 2) Social survey about public perception -> Through the obtaining these means, it shall be considered how to measure the understanding of above indicators quantitatively.	<p>The Mozambican counter personnel of the Project will not change their position dramatically during the Project term.</p> <p>Stakeholders will not oppose to the implementation of each Pilot Projects.</p>

<p>2. Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.</p>	<p>1) Amount of collection and transportation of solid waste is increased by XX%. -> <i>It shall be determined when the future projection of waste generation would be done at the stage of M/P updating.</i> 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to XX (number). -> <i>Definition of "recyclable collection" will be determined in 2nd year.</i> 3) Rate of broken container is decreased by XX%. 4) Number of container adequately allocated is increased to XX (number). -> <i>These will be carefully discussed based on the monitoring result on waste container collection.</i></p>	<p>1) Project report / annual monitoring report of DMGRSUS (to describe solid waste collection and transportation amount quoting from weighbridge report). 2) Project report / annual monitoring report of DMGRSUS (to measure the number of Bairros to implement recyclable collection). 3,4) Project report / annual monitoring report of DMGRSUS</p>
<p>3. Capacity for financial management of SWM in CMM is improved.</p>	<p>1) Financial operation procedure is shared with official document. 2) Revenue baseline data is regularly collected and reported. 3) Budget is planned by considering the variance between budget execution and budget plan of the previous year.</p>	<p>1) Financial operation manual 2) Annual financial report 3) Annual budget planning report</p>
<p>4. 3R activities for reduction of solid waste (including private sector) is introduced in project target area.</p>	<p>1) Educational material about 3R is developed. -> <i>Types of "educational material" shall be discussed in 2nd year.</i> 2) New office for civic education is established in DMGRSUS. 3) Amount of material recovery in the Pilot Project area is increased by XX%. 4) Amount of compost in the Pilot Project area is increased by XX%. -> <i>Detail value of indicators shall be discussed and determined in the Pilot Project designing stage in 2nd Year</i></p>	<p>1) Project Report / Annual Report of CMM 2) Establishment of a new office for civic education and its activity report. 3,4) Project Report / Annual Report of CMM</p>

Activities	Input	
<p>1-1 Review the existing M/P and identify differences compared to actual situation.</p> <p>1-2 Collect and review latest information and data of waste quantity and composition and final disposal volume.</p> <p>1-3 Update the existing M/P.</p> <p>1-4 Develop an Action Plan for the project period based on the updated M/P.</p> <p>1-5 Develop a guideline of SWM for Maputo City.</p> <p>1-6 Set a target of SWM for post-termination of the Project and develop a draft of M/P.</p> <p>1-7 Develop the Action Plan toward 2021.</p>	<p>1. Japanese Side</p> <p>(a) Dispatch of Experts</p> <ul style="list-style-type: none"> - Chief Advisor / Solid Waste Management - Solid Waste Collection and Transportation - 3R Planning - Environmental Public Awareness Raising / Capacity Development - Financial Management Development <p>(b) Vehicle</p> <p>(c) Equipment and Materials necessary for the Pilot Projects and Public Awareness Raising</p> <p>(d) Counterpart Training in Japan (2-3 counterpart personnel (C/Ps) × twice)</p>	
<p>2-1. Review the situation of waste collection and transportation in Maputo City.</p> <p>2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3.</p> <p>2-5 Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned.</p> <p>2-6. Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5.</p> <p>2-7. Review and feedback the result of the Pilot Project conducted in Activity 2-6.</p> <p>2-8. Develop the Action Plan for improvement of waste collection and transportation.</p>	<p>2. Mozambican Side</p> <p>(a) Assign of Counterpart Personnel (C/Ps)</p> <p>(b) Facilities and Equipment Necessary for the Project Implementation</p> <p>(c) Office Space for the Japanese Experts</p> <p>(d) Necessary Expenses for the Activities</p> <ul style="list-style-type: none"> - Salaries and Other Allowance for Government Officials - Expenses for Utility such as Electricity, Water Supply, and Gas Fuel - Operational Expenses for Customs Clearance, Storage and Domestic Transportation 	
<p>3-1. Review and analyze the current financial management of SWM to identify problems.</p> <p>3-2. Collect periodical data on tax-and-spend of wastes every month.</p> <p>3-3. Enter the data and calculate annual budget and monthly expense.</p> <p>3-4. Develop annual financial report.</p> <p>3-5. Develop annual budget planning.</p> <p>3-6. Review the waste service fee.</p> <p>3-7. Develop the Action Plan for improvement of the financial management.</p>		
<p>4-1. Review the current status of recycling activities for recyclable materials (waste papers, glass, metals, and plastics) and organic wastes.</p> <p>4-2. Study possibility for recycling of materials (including cooperation with waste pickers).</p> <p>4-3. Review and improve public awareness raising programs for 3R introduction.</p> <p>4-4. Implement improved programs for 3R introduction.</p> <p>4-5. Develop a plan for a Pilot Project for promotion of recycling activities (cooperation with private sector) based on the results of Activity 4-2.</p> <p>4-6. Implement a Pilot Project for expansion of the recycling activities (cooperation with private sector) based on the result of Activity 4-2.</p> <p>4-7. Review the result of the Pilot Project in Activity 4-6, and develop a plan for promotion of the Pilot Project.</p> <p>4-8. Develop a plan for a Pilot Project for the utilization of organic waste.</p> <p>4-9. Implement the Pilot Project for the utilization of organic waste.</p> <p>4-10. Review the result of the Pilot Project in Activity 4-9, and develop a plan for promotion of organic waste utilization.</p> <p>4-11. Develop the Action Plan for expansion of the Pilot Project for valuables recycling and organic waste utilization.</p>		<p>Pre-Conditions</p> <p>The CMM will secure the enough budget to implement the Project.</p>

Plan of Operation (Version 2.0)

Activity	Actual Progress												Schedule																											
	1ST YEAR												2ND YEAR								3RD YEAR								4TH YEAR											
	2013												2014								2015								2016								2017			
	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			
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Note: After the 3rd JCC, it was confirmed by JICA headquarters and JICA project team that the mid-term evaluation will be carried out in November, 2014, shifted from February 2015 which was planned in the original PO

**MINUTES OF MEETING
ON
THE FORTH JOINT COORDINATION COMMITTEE
FOR
THE PROJECT FOR PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
IN THE REPUBLIC OF MOZAMBIQUE**

The 4th Joint Coordination Committee Meeting (hereinafter referred to as “JCC”) was held on November 27, 2014 at the meeting room of the Municipal Training Center of the Municipal Council of Maputo (hereinafter referred to as “CMM”), where is located to next to the Municipal Directorate of Urban Solid Waste Management and Cemetery (hereinafter referred to as “DMSC”). Participants were the City Councilor for Waste Management as the chairman, Japanese mid-term evaluation team member, Deputy Resident Representative of JICA Mozambique Office, some representatives from MICOA, FUNAB’s Managing Director, related JCC members from the CMM, together with the counterparts of DMSC and JICA expert team (hereinafter referred to as “JET”). The representative of the Embassy of Japan was also attending to the meeting as an observer.

The purpose of the 4th JCC was to report and to confirm the result of joint mid-term review on the progress of the Project for Promoting of Sustainable 3R Activities in Maputo (hereinafter referred to as “the Project”), as written in the attached document.

As a result of the 4th JCC, both the Maputo side and JICA team side confirmed the result of the joint mid-term review and signed on the Minutes of Meetings.

Maputo, December 1st, 2014



Mr. Florentino Ferreira
City Councilor for Waste Management
Municipal Council of Maputo



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Opening Remarks

At the beginning of the JCC meeting, the JCC chairman, Mr. Florentino Ferreira who is the City Councilor for Waste Management, mentioned in his opening remarks that the project is now entering the very important stage and some visible outputs from the project have been observed. The chairman also mentioned about 3R that no one knew about the word of “3R” before but now it has been realizing among not only concerned people but also the ordinal residents including students. He also pointed out the importance of the joint ownership between Mozambican side and JET to share the result of the pilot projects.

Following the chairman, Ms. Chiharu Morita from JICA Mozambique Office also gave her opening intervention, with her expectation to the project that will be more accelerated in the remaining project period to prepare the new master plan through the active participation of the counterparts to the project, especially to the implementation of the pilot project.

2. Report of the Result of Joint Mid-term review

The result of the joint mid-term review was reported by both Mozambican and Japanese review members. First, achievement of the project activities was explained by Ms. Luisa Langa Bila, the project coordinator and the head of Planning and Monitoring Department of DMSC, output by output in addition to the project purpose.

Then, Mr. Jun Totsukawa, an expert for the evaluation analysis, reported the result of evaluation by 5 criteria, which are “relevance”, “effectiveness”, “efficiency”, “impact” and “sustainability”.

At the end, Mr. Ken Okumura who was in charge of the project cooperation in the review team reported the results of the mid-term review and recommendations to the project, together with the brief introduction of the contents of Minutes of Meetings.

In the Q&A session after the reporting, following comments and questions were raised from the participants.

1) Clarification on the organic waste reduction pilot project

Two comments from Mr. Agostinho Fernando from MICOA were raised, first one was the location of the bairros for the pilot project, and second one was how to secure the quality of compost product because there is no specific regulation and standard related to the compost quality in Mozambique yet.

Corresponding to above, Ms. Luisa Langa Bila of DMSC introduced that the pilot

project will be conducted in two birros, Costa de Sol and Mahotas. In addition, Mr. Kenji Igarashi, an expert to 3R planning of JET, explained that the expected product from the organic waste reduction pilot project is a kind of soil conditioner as a low quality of compost with the simplified method, not sophisticated technology to produce the compost equivalent to the fertilizer.

2) Polluters Pay Principle

Mr. Herlander Namuiche, a national expert for JET, pointed out the lack of the national regulation related to “Polluters Pay Principle”, mentioning about that there are huge amount of the used glass bottles such as imported beer bottle has been accumulated and dumped, not recycled.

Corresponding to this, Mr. Agostinho Fernando from MICOA explained that the new regulation approved by the Council of Ministers foresaw such principle among other aspects.

3) Waste Co-processing Technology

As for reference. Mr. Samson Cuamba from AQUA under MICOA informed that there is a plan created for the co-processing of waste in cooperation with several industries. The next survey may include the companies that will be also involved in the co-processing of recyclables. He also mentioned that the Council of Ministers has approved two regulations, one for hazardous waste and the other for non-hazardous waste.

4) Necessity of Public Awareness Raising

Ms. Angela Matsinhe, from the Department of Economic Activity of the CMM pointed out that it is necessary for the CMM to raise people’s awareness on the management of public affairs, because it is still observed that some citizens continue littering waste easily on the floor or discharging waste at non-appropriate time. These problems need to be solved through the civic educations.

Corresponding to this, Ms. Ludite Sara of DMSC explained that the office of civic education and environmental promotion of DMSC had been conducting civic education campaigns in several institutions such as primary and secondary schools, universities and enterprises in the scope of promotion of best practices of waste management. She also mentioned these campaigns are also being made through radio and TV and the waste discharge time was modified to be from 15:30 pm to 19:00 pm.



3. Wrap-up Discussion and Confirmation

Before the wrap-up discussion, Mr. Sergio Manhique of DMSC presented the proposal of modification of PDM Indicators which had been discussed during the mid-term review. Since there were still some indicators that need to be determined their quantities value, the discussion on the PDM indicators would be continued and might be concluded at the next JCC which is planned to hold in June, 2015.

Mr. Shungo Soeda, a chief advisor of JICA expert team, repeated the summary of recommendations made in the joint mid-term review report and introduced his views of future activities or considerations corresponding to these recommendations during the remaining project period by sharing the project schedule table.

At the end, Mr. Kazunao Shibata, a leader of the mid-term evaluation mission, concluded the discussion with the expectations for the project team consists of both Mozambican counterparts and JET to continue the project activities reflecting the outcomes by the Mid-term review mission.

4. Closing

After the above wrap-up discussion, the minutes of meetings was signed by the city councilor and the leader of the mid-term review team.

At the end of the JCC, the city councilor gave his closing remarks again mentioning about the importance of joint work with the ownership on the project.



END



Appendix I

List of Participants

Participants from the Mozambican Side

CMM

Mr. Florentino Ferreira	City Councilor for Waste Management and Cemeteries
Mr. Nilton Alexandre Mate	International Relations Office
Ms. Angela Matsinhe	Directorate of Economic Activities
Mr. Cerio Maximian	Directorate of Finance

Ministries and Others

Mr. Carlos Seventine	General Director of FUNAB (Environmental Fund)
Mr. Agostinho Fernando	Department of Urban Environment of MICOA
Mr. Samuson Cuamba	AQUA (National Agency of Environmental Quality Control) of MICOA

DMGRSUS, CMM

Mrs. Luisa Langa Bila	Planning and Monitoring Department
Mr. Sérgio Manhique	Planning and Monitoring Department
Ms. Rosa Paula	Administration and Finance Section
Ms. Ludite Sara	Office of Civic Education and Environmental Promotion
Ms. Rute Massingue	Office of Civic Education and Environmental Promotion
Ms. Elsa F. Cossa	Office of Civic Education and Environmental Promotion
Ms. Florencia Martins	Department of Planning and Monitoring

Participants from the Japanese Side

JICA Mid-Term Review Team

Mr. Kazunao Shibata	Leader
Mr. Ken Okumura	Project Coordination
Mr. Jun Totsukawa	Evaluation Analysis

JICA Expert Team

Mr. Shungo Soeda	Chief Advisor
Mr. Kenji Igarashi	Team Expert
Mr. Tomoyuki Hosono	Team Expert
Ms. Grace Marco Neptuno	Team Expert
Mr. Geraldo Saranga	Technical Assistant
Mr. Rogério Mole	Technical Assistant
Mr. Herlander Namuiche	Technical Assistant
Mr. Acácio Muhosse	Translator/ Interpreter
Mr. Ilénio Mate	Translator/ Interpreter
Ms. Valdelise Gonçalves	Secretary

JICA Mozambique Office and Japan Embassy

Ms. Chiharu Morita	Deputy Resident Representative, JICA
Ms. Megumi Tsukizoe	Assistant of Resident Representative, JICA
Mr. Stélio Massuque	Program Officer, JICA
Ms. Sandra Laura	Representative of Japan Embassy

**MINUTES MEETING
ON
THE FIFTH JOINT COORDINATION COMMITTEE
FOR
THE PROJECT FOR PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
IN THE REPUBLIC OF MOZAMBIQUE**

The 5th Joint Coordination Committee Meeting (hereinafter referred to as “JCC”) was held on June 10, 2015 at the meeting room of the Municipal Directorate for Solid Waste Management and Cemeteries (hereinafter referred to as “DMSC”) of the Municipal Council of Maputo (hereinafter referred to as “CMM”). Participants were the City Councilor for Waste Management as the chairman, Resident Representative of JICA Mozambique Office, representatives from both MITADER and FUNAB, municipal officer from Matola Municipality, and representatives from different institutions such as NGOs, Private Haulers, Micro Enterprises together with concerned staff of DMSC and JICA expert team (hereinafter referred to as “JET”).

The purpose of the 5th JCC was firstly to report the progress of activities conducted during the second year of the Project for Promoting of Sustainable 3R Activities in Maputo (hereinafter referred to as “the Project”). As for second purpose, the proposal on revising the Project Design Matrix (PDM) and the draft Work Plan of third and forth years’ activities were confirmed, discussed and approved.

As a result of the 5th JCC, both the Maputo side and JICA expert team side confirmed the progress of the project and approved the revised PDM and Work Plan of third and forth years’ activity in the document attached hereto.



Mr. Florentino Ferreira
Chairperson of Joint Coordination
Committee,
City Councilor for Waste Management
Municipal Council of Maputo

Maputo, June 10th, 2015



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Opening interventions

At the beginning of the JCC meeting, the JCC chairperson, Mr. Florentino Ferreira who is the City Councilor for Waste Management, gave his opening interventions starting from introducing the fact that many improvement of solid waste management for Maputo City had been observed since this project was commenced in March 2013. Especially, he pointed out that Mozambican counterpart had been showing their ownership for the project little by little but securely and widely. He explained one example for the ownership which was the progress meeting, was difficult to organize regularly in the first year of the project but .had become a kind of usual task of the DMSC counterpart in the second year.

Then, he explained the importance of the individual development plan for the municipal staff which is aimed at developing the personal capacity of the staff including technical skills. Therefore, he gave his expectations that the capacity of the municipal staff would be developed through the participating in the project.

He also talked about, understanding though it was not directly related to the designated activities of the project, a new sanitary landfill to be constructed at Matlhamelo in Matola Municipality with the financial support by Korean import-export bank. He expected to have any technical support by JICA Expert necessary on this landfill plan which aims to start its operation in 2 to 3 years, during the preparation time of the Master Plan.

He reported that the pilot projects implemented in the project, at Bairros of Chamanculo D, Mahotal and Costa do Sol, had been showing some expected result to be considered for the its expansion and practices at other area in future. He again expected that DMSC counterparts should learn these knowledge though the active participation to the pilot project.

Finally, the Chairman emphasized that the DMSC and CMM was on the front line for the improvement of solid waste management including the activities related 3R in Mozambique. Civic education activities are most significant challenge, starting in small scale and expanding its covering area to various activites.

Following the intervention by the chairman, Mr. Katsuyoshi Sudo of JICA Mozambique Office gave his opening intervention with an appreciation for the positive participation of Mozambican counterparts and other concerned people to the project. He also reminded the participants the original purpose and framework of the project described in the PDM. In addition, he also reminded the result and recommendations of the mid-term review conducted by JICA Headquarters in November 2014, that the sustainability and ownership

of the project was more expected to maintain and improve during the last half of the project period. At the end, he expressed his expectations that all activities including pilot projects would be continued to implement with more solid partnership among the stakeholders led by DMSC and JICA expert team for the third and fourth years of the project.

2. Report of the second year's progresses

Mr. Sergio Manhique of DMSC presented the summary of the progress report of the second year.

Report was starting from the confirmation of the project framework which showed the overall goal, project purpose, and four outputs designated in the PDM. Then, he explained the result of analysis of the waste quantity disposed of at Hulene Dumping Site and issues for the stable operation of waste weighing at the site. Next topic he introduced was the development and monitoring of the action plan which was a series of practical plans under the updated M/P prepared in the first year of the project, as a progress of the activities for output1.

As for the progress of the activities for output2, the result of implementation of a pilot project to examine the introduction of source separated collection of recyclables in Chamanculo D Bairro was introduced. Analyzed data of revenues, expenditures and budget of solid waste management in Maputo City was also reported as the progress of output 3 activities. At the last of presentation, the progress of the activities for output4, which were civic education activities including the environmental fair during Maputo Day's week and implementation of another pilot project for organic waste utilization at household level by using the plastic barrel for the fermentation of vegetable waste, was reported.

3. Work Plan of third and fourth years' activities

Summarized contents of Work Plan for the third and fourth year's activities were presented by four DMSC counterparts themselves.

Firstly, Ms. Luisa Bila reviewed the outline of the project such as the framework, implementation structure, project member of both DMSC counterparts and JET, and schedule of the remaining project years. She continuously explained that preparation of solid waste management guidelines and master plan including action plans would be done as the activities of output 1.

After Ms. Luisa Bila, Ms. Meriamo Stela explained the activities of output 2 which would

be a pilot project for improvement waste collection and transportation in the urban area by efficient information management system. This activities would be cooperated with a private contractor who is collecting the waste in the urban area.

As the third presenter, Ms. Rosa Chissico introduced the planned activities for output3 which is to improve the financial management capacity of DMSC. She mentioned that most activities such as collection and analysis of financial data, and development of both annual financial report and budget planning report were continued from the previous years.

At the end of presentation, Ms. Florencia Francisco explained activities of output4, mainly focusing on a pilot project for organic waste utilization implemented at Mahotas and Costa do Sol Bairro.

4. Proposed modification of PDM and PO, the draft Work Plan of second year's activities

Mr. Shungo Soeda, Chief Advisor of the project team, made a presentation on the proposed modification of "Objectively Verifiable Indicators (OVIs)" and "Means of Verification" of the PDM, considering the result of activities implemented in the previous years.

While minor modification of OVIs was proposed for overall goal, project purpose, output2 and output4, "Means of Verification" on overall goal, output1 and output3 was also proposed to be modified.

5. Wrap-up Discussion and Confirmation

In the session for wrap-up discussion and confirmation, firstly JICA Mozambique Office was confirming about usage place of and demand for "soil conditioner" that was expected to produce by the organic waste utilization P/P. Related to the same P/P, MITADER also questioned what would be the monitoring result from the P/P.

It was answered by the presented counterparts that the products from the P/P would be used only at the household who are participating in the P/P without any sales outside, and that the products would be chemically analyzed for quality check.

Directorate of Market and Fair of CMM was expressing their intentions to conduct the civic education activities at the markets in Maputo City because the waste disposed into the container was still mixed with many recyclables. DMSC answered that civic education activities at the market had been already listed in the list proposed in the draft of strategic

plan of civic education and would be conducted near future as DMSC own activity.

JICA Mozambique office was again confirming the source of data presented and wondering how the population growth would be reflected to the M/P. It was answered that the waste quantity data was obtained from the weighbridge record at the dumping site and the population growth rate and number would be used for the projection of waste generation quantity in future.

A gentlemen from the floor suggested the cost benefit analysis on the impact of introduction of 3R activities could be conducted in the M/P, together with another suggestion to involve MITADER more for the project. Those suggestions were noted.

AMOR pointed out the importance of involvement of schools on the civic education activities for environmental conservation, because motivating the children could be a good strategy to promote public understanding.

FUNAB expressed their expectation to the project that the lesson learnt from the P/P should be carefully verified and used to apply to other area in Maputo City in future. She also expected not only the project but also CMM to overcome the difficulty of public awareness because of that residents were usually fearing the new things that they never experienced before.

City councilor for Finance suggested that the some activities for waste and recyclable collection should be conducted at large condominium in the urban area. She also commented sustainability of the programs proposed in the M/P should be discussed together with the feasibility of financial resources.

6. Closing Comments

As for closing remarks, Mr. Florentino Ferreira, made his closing remarks, again pointing out the following matters.

- 1) The Project Team should be aware of that we are on the front line of solid waste management together with 3R Policy in the country. Therefore, the revised M/P should be more innovative with new concept.
- 2) For example, since the waste collection and transportation cost is very huge, it should be discussed in the M/P what types of waste collection and transportation could be more cost effective when the current contract for the secondary transportation in sub-urban area will be completed in 2017.



Finally, he expressed his full commitment for the success of the project with the approval on the work plan and modified PDM.

A handwritten signature in black ink, appearing to be 'J. H.' or similar, located in the upper right corner of the page.

Apêndice I

Lista de Participantes

Participantes do Lado Moçambicano

CMM

Sr. Florentino Ferreira

Sra. Célia Ema Cumbe

Vereador do pelouro de Salubridade e
Cemitérios

Vereadora de Finanças

MITADER

Sr. Sipriano

Chefe do Departamento de Gestão de
Resíduos Sólidos

FUNAB

Sra. Anchia Bobina

Técnica do FUNAB

Conselho Municipal da Matola

Sra. Célia Carlos Beira

Directora de Gestão de Resíduos Sólidos

DMSC, CMM

Sr. João Mucavele

Sr. Domingos P. Chivambo

Sra. Luísa Langa Bila

Sr. Sérgio Manhique

Sr. António Ferreira

Sr. Simão Pedro Muterreda

Sr. Anselmo Inguane

Sra. Florência Martins

Sra. Rosa Paula

Sr. Faustino Tsotsane

Sr. Hermínio Zandamela

Sr. Ibrahim Caroga

Sr. Zefanias Langa

Sr. António Chaúque

Sra. Hortência Nhamahango

Sr. Mário Manjate

Director, DMSC

Vice-director, DMSC

Departamento de Planificação e Monitoria

Departamento de Planificação e Monitoria

Departamento de Administração e Finanças

Departamento de Planificação e Monitoria

Departamento de Planificação e Monitoria

Departamento de Planificação e Monitoria

Repartição de Administração e Finanças

Repartição de Administração e Finanças

Departamento de Finanças

Departamento de Planificação e Monitoria

Departamento de Gestão de Resíduos
Sólidos

Departamento de Planificação e Monitoria

Departamento de Planificação e Monitoria

Departamento de Oficinas.

Sra. Rute Massingue	Gabinete de Educação Cívica
Sr. Alfred Leitão	Gabinete de Educação Cívica
Sr. Raimundo Julião Manjate	Departamento de Recursos Humanos
Sr. Martins Mandlate	Departamento de Gestão de Resíduos Sólidos
Sra. Constância Bambu	Direcção de Mercados e Feiras

ONGs, micro-empresas, Associações, etc

Sra. Ester Uamba	Coordenadora, AMOR
Sr. Armindo Buque	Representante da SERLIMPES, Lda
Sr. Adriano dos Santos	Representante da ACADEC
Sr. Paulino	Representante da AMMEPS
Sr. Juca	Representante da AMMEPS
Sr. Oliveira Rodrigues	Representante da AMMEPS

Participantes do lado japonês

Equipa de Peritos da JICA

Sr. Shungo Soeda	Assessor Chefe
Sr. Takahiro Kamishita	Equipa de Peritos
Sra. Grace Marco Neptuno	Equipa de Peritos
Sr. Rogério Mole	Assistente Técnico
Sr. Herlander Namuiche	Assistente Técnico
Sra. Juliana Arsénio Come	Assistente Técnico
Sr. Ilénio Mate	Tradutor/ intérprete
Sr. Acacio Muhosse	Tradutor/ intérprete
Sra. Fátima Rustangy	Secretária

Escritório da JICA em Moçambique e Embaixada do Japão

Sr. Katsuyoshi Sudo	Representante Permanente, JICA
Sra. Chiharu Morita	Representante Permanente Adjunta, JICA
Sra. Megumi Tsukizoe	Assistente do Representante Permanente, JICA
Sr. Stélio Massuque	Oficial de programas, JICA

**MINUTES OF THE SIXTH MEETING
ON
THE JOINT COORDINATION COMMITTEE
FOR
THE PROJECT FOR THE PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
REPUBLIC OF MOZAMBIQUE**

The 6th Meeting of the Joint Coordination Committee (henceforth called “JCC”) was held on June 9th, 2016, at the Training Center of the Municipal Council of Maputo (henceforth called “CMMTR”). At the meeting were the City Councilor for Waste Management and Cemeteries in the capacity of Chairperson, Resident representative of JICA Mozambique Office, representatives from MITADER and FUNAB, and other representatives from different institutions, NGOs, private solid waste collection companies, micro-enterprises as well as relevant staff of the Municipal Directorate for Solid Waste Management and Cemeteries (hereinafter referred to as “DMSC”) of the Municipal Council of Maputo (hereinafter referred to as “CMM”) and members of the JICA Expert Team (henceforth called “JET”).

The purpose of the 6th JCC meeting was to report on the progress of the activities implemented in the third years of the Project for the Promotion of Sustainable 3R Activities in Maputo (henceforth called “the Project”), and also to present the proposal of the Work Plan of the activities for the fourth which is the last year of the Project.

As a result of the 6th meeting of the JCC, both the Mozambican side as well as the JICA Expert Team side confirmed the progress of the project and approved the Work Plan for the fourth year of activities, in the attached document.

Maputo, June 9, 2016



Mr. Florentino Ferreira
Chairperson of Joint Coordination
Committee,
City Councilor for Waste Management
Municipal Council of Maputo



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Opening Remarks

The meeting started with the opening remarks from the Chairperson of the JCC, Mr. Florentino Ferreira, who justified the absence of the Director and Deputy Director of DMSC. During his opening remarks, the city councilor highlighted the support from JICA to DMSC during the Project. Additionally, he thanked the Non-governmental Organizations (NGOs), Micro-enterprises and other participants for their contribution for solid waste management in Maputo City. The City Councilor also gave a brief overview of the Project, which is supported by JICA, and mentioned its main objective which is to develop the capacity of the solid waste management of the Municipal Directorate through updating of the Master Plan of the urban solid waste management and other related activities. The city councilor also mentioned that this 3R Project was started from March 2013 and will be continued for 9 months more until its completion by February 2017.

He also pointed out that JICA's presence at the DMSC coincides with the construction of the new sanitary landfill in Mathlamele, Matola Municipality, which will benefit both municipalities, and that the pilot-projects implemented in Chamanculo D, Zimpeto, Mahotas and Costa do Sol neighborhoods were completed with positive results and that considerations should be made for their expansion to other areas, in the future.

Mr. Katsuyoshi Sudo, JICA resident representative in Mozambique thanked, on his intervention, the participation of the Mozambican counterpart and of other relevant people for the Project, with highlight to DMSC for its commitment throughout the Project. He also mentioned that, since the pilot-projects were completed as the city councilor mentioned, it would be the responsibility of the Maputo Municipal Council to ensure their continuation.

He also reminded the participants about the recommendations given at the midterm review conducted by JICA in November, 2014 and the project had been following those recommendations. He pointed out that JICA's terminal evaluation would be conducted in August this year, 2016 to assess the project focusing on the overall targets on the Project and on its subsequent sustainability.

He stated that the results of the Project are being achieved and that success can only be achieved through joint actions.



2. Report on the Progresses of the Third Year

There was a total of eight (8) presentations at the JCC, seven of which were dedicated to report to the participants the progress of the activities conducted in the third years (Outputs 1, 2, 3 and 4) and the common issues of the Project Outputs and Schedule. The last one was an explanation of the work plan for the 4th Project year.

The presentations of the results of the third year of the Project were, namely:

- **Output 1 – Master Plan Updating**

Presented by Mr. Simão Mutereda, in the status of the Master Plan Updating, where he focused on the objectives of the plan, gave a brief description of the organizational structure and presented a comparative table of the table of contents of the existing (2007 to 2017) and the proposed Master Plans (2017 to 2027)

- **Output 2.1 – Solid Waste Collection and Transportation in the Urban Area**

At first, Mr. Zefanias Langa presented about the improvement of solid waste collection and transportation in the urban area. The activities aim at the general improvement of solid waste collection and transportation in the urban area and the specific objective is the identification of critical points with waste accumulation. The analysis was conducted from June to December, 2015.

Critical points analyzed: an effective communication between the Solid Waste Management Department and the Supervision Section, and the identification of frequent problems which are, mostly, debris, scrap, branches and burning of containers.

Mr. António Chaúque followed and made a presentation on the mapping system of all sites with containers in the urban area. He also explained how was made the identification of areas with problems such as illegal dumping and waste outside containers. The system is used to channel these problems to be solved by the Solid Waste Management Department.

- **Output 2.2 – Solid Waste Collection in the Suburban Area**

Ms. Meriamo Novela made an explanation on the monitoring of the waste collection and transportation systems in the suburban area as well as of the results of the surveys and pilot projects conducted for the improvement of the existing systems which is communicating with the private large contractor through road sheets report.



- **Output 3 – Financial Management**

Mr. Leonardo Almajane focused on the current status of the directorate's Financial Management system. He also presented a numerical comparison between the planned and executed budgets, showing the trend for the reduction of the difference between them.

- **Output 4.1 – 3R Planning**

Ms. Florência Francisco explained that activities of this output were related to the different activities under the 3R projects which were also introduced by other members. She summarized the contents and results of pilot projects related to 3R that were implemented over the past two years, namely composting project in Costa do Sol and Mahotas neighborhoods, as well the 3R Station in Zimpeto neighborhood.

- **Output 4.2 – Civic Education**

Mr. Alfredo Leitão firstly reported about the Civic Education and Environmental Promotion Office which was established in December 2013, with the aim of dissemination good practices on 3R and appropriate solid waste management. Then he explained more detail on the activities on the civic education, ranging from campaigns to exhibitions and the support manual to teachers and students, aiming at the sensitization

- **Common Issues of the Project Outputs and Schedule.**

Ms. Adelina Mocubela presented the common issues to all outputs and schedule of the Project as summarized in the progress report of the third year activities. As for the overall achievement of the counterparts, it was explained the work attitude of them had been improved with more positive manner. On the other hand, however, there are still issues to be improved such as the sense of solidarity such as sharing the experiences of the counterparts who had the training in abroad to others of DMSC, for example.

3. Work plan of the activities of the fourth year

The summarized content of the Work Plan for the forth year of activities was presented by Mr. Sérgio Manhique, who presented a scheme of the project's implementation structure and the respective members. He also presented the activities schedule for each output, stressing the main activities for each output.

As for the Output 1, there are three main points, which are the design of solid waste



management guidelines for Maputo City, the Master Plan including the definition of solid waste management targets for the post-termination Project period, and the Action Plan for 2021. This action plan will be prepared based on the activity experienced in the first year of the Project that tried to prepare the tentative action plan for the Project period. As for the Output 2, the remaining activity is to develop the practical plan for the improvement of waste collection and transportation to be finalized as the component of the action plan.

As for Output 3, which is on DMSC Financial Management, the main activity for the 4th Project year is the definition of a cleaning fee and the design of an action plan for the improvement of financial management and, lastly, the target of Output 4 for the last year of the Project is the design of a promotion plan of the pilot-projects of recycling activities and the use of organic waste as well as the development of an action plan for the expansion of the pilot-projects on recycling and organic waste utilization.

4. Discussion and Confirmation

In the wrap-up session, the City Councilor made comments on some issues raised by the participants during the meeting. He started by clarifying the issue on the sanitary landfill of Mathlemele, raised by Mr. Paulino Uaiene from Association of Micro Enterprises (AMEPS), by stating that the total area of the site for the future sanitary landfill is of 100ha and that CMM already has the land use rights (DUAT) for this area, despite that only 60ha are available now, since the remaining 40 were invaded by the local population. He also stated his expectation that the funding for the construction of the sanitary landfill is already available and that soon a tender will be launched for its construction after the that social issues will be solved, because the closure of Hulene dumpsite is very urgent and crucial.

Mr. Dercio Alfredo, a DMSC technician who works at the Hulene dumpsite mentioned that during Mr. Langa's and Mr. Chauque's presentation, it was only pointed out the difficulties on collecting waste in the urban area, but not presented concrete solutions for those problems. He also spoke about the difficulties faced now that the weighbridge was not functional. The staff from the counterpart answered to some questions related to the functioning of the weighbridge and the resolution of weighbridge related problems, since waste disposal and dumpsite operations are difficult when the weighbridge is not operational. Because, when the weighbridge is not functional, the quantities of the deposited waste could be only measured by the number of times that a certain transporter goes into the dumpsite to dispose of the waste, so most transporters rush to go into the dumpsite

the dumpsite to dispose of the waste, so most transporters rush to go into the dumpsite numerous times with less quantities instead of disposing of the waste with the full capacity of transportation trucks.

As for the waste collection system in suburban area, the City Councilor gave his idea that the current collection system should be adjusted to the urbanized situation in those area, also taking into consideration ME's, waste transporters and the distance to the site of the new sanitary landfill.

Mr. David Malauene, an environmental consultant applauded the Municipality for the work that had been being done regarding solid waste management by the Project and suggested involving Civil Society in these type of meetings. He also would like to know whether the hazardous waste would be included in the master plan or not. It was answered that the master plan to be revised under this project could only cover the non-hazardous municipal waste for its collection and disposal. The City Councilor commented to the suggestion by Mr. Malawi which is related to the cleaning fee, that CMM should provide the appropriate waste management service first to residents so that residents would understand the need to pay the suitable amount of the cleansing fee.

Following the City Councilor, Mr. Soeda highlighted the fact that almost all preparation of this JCC meeting including the presentation material was initiated by Mozambican counterparts with some support by JET, showing the improvement of their capacities.

He also reminded the counterparts to keep such positive motivation and commitment to continue participating in the Project during the remaining period of the project as it was or more to prepare the master plan. He explained about the JICA terminal evaluation that would be conducted in August to verify the achievement of the project activities.

5. Closing Remarks

During the closing remarks, Mr. Florentino Ferreira expressed his gratitude to the participants and his DMSC staff and also confirmed the approval of the work plan.

In addition, he explained that now the discussions were ongoing with JICA for the possibility of continuation of the further technical support after the completion of the Project for the Promotion of Sustainable 3R Activities, as well as the expansion of the MOPA project (participatory monitoring project funded by the World Bank), for the cleaner city of Maputo.

At last, the City Councilor expressed his total commitment for the success of the Project.



Appendix:

List of participants

Participants from the Mozambican Side

CMM

Mr. Florentino Ferreira City Councilor for Waste Management and Cemeteries

MITADER

Agostinho Fernando Department of Urban Environment, MITADER

CMM – DMSC

Mr. Domingos P. Chivambo	Deputy Director, DMSC
Mr. Sérgio Manhique	Planning and Monitoring Department
Ms. Rosa Paula	Administration and Finance Department
Mr. Leonardo Almanjane	Administration and Finance Department
Mr. Ibraimo Caroga	Proof of Service
Ms. Adelina Mocubela	Proof of Service
Mr. Anselmo Inguane	Planning and Monitoring Department
Ms. Hortencia Nhamahango	Planning and Monitoring Department
Mr. Fidel Henriques	Planning and Monitoring Department
Ms. Florencia Francisco	Planning and Monitoring Department
Mr. Simão Pedro Mutereda	Planning and Monitoring Department
Ms. Euridia Isabel	Civic Education Office
Mr. Alfredo Leitão	Civic Education Office
Ms. Rute Massingue	Supervision Section
Ms. Elsa Manhique	Supervision Section
Mr. Antonio Chauque	Supervision Section
Ms. Meriamo Stela	Urban Solid Waste Management Department
Ms. Zefanias Langa	Urban Solid Waste Management Department
Mr. Raimundo Manjate	DMSC
Mr. Adolfo Caunde	DMSC
Mr. Delcio Arlindo	DMSC
Mr. Carlos Sumbane	Municipal Police

CMM – Other Directorates

Ms. Angela Matsinhe DMAE (Municipal Directorate of Economic Activity)

Mr. Inacio Carlos	FNDS
Mr. Nilson Mate	DMRI (Municipal Directorate of International Relations - GRI)

ONGs, MEs, Associations

Mr. Juca Rodrigues	ACADEC
Ms. Ester Uamba	AMOR
Mr. Abilio Manhica	AMOR
Mr. David Malauene	CEP
Mr. Norberto Costa	Ecolife
Mr. Jose Ferreira	Ecolife
Mr. Desiderio Fernando	EnviroServ
Mr. Jordão Matimula	EnviroServ
Mr. Armindo Buque	Serlimpes, Lda
Mr. Paulino Uaiene	UGSM

Participants from the Japanese Side

JICA Mozambique Office

Mr. Katsuyoshi Sudo	Resident Representative
Ms. Makiko Inamori	Assistant of Resident Representative
Mr. Stélio Massuque	Program Officer

Embassy of Japan

Mr. Shuichiro Arafune	Third Secretary
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JICA Expert Team

Mr. Shungo Soeda	Chief Advisor
Ms. Grace Marco Neptuno	Team Expert
Ms. Elis Mavie	Technical Assistant
Ms. Candida Boavida	Technical Assistant
Mr. Mário Fijamo	Technical Assistant
Mr. Ilénio Mate	Translator/ Interpreter
Mr. Acacio Muhosse	Translator/ Interpreter
Ms. Fátima Rustangy	Secretary
Ms. Akemi Seki	JICA Volunteer
Mr. Yuta Yamazoe	JICA volunteer

MINUTES OF MEETINGS
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
MAPUTO MUNICIPALITY
ON
JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT FOR PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO

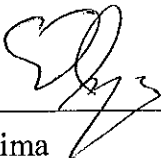
Japanese Terminal Evaluation team (hereinafter referred to as “the Team”) organized by the Japan International Cooperation Agency (hereinafter referred to as “JICA”) visited the Republic of Mozambique from August 5 to August 19, 2016, the purpose of conducting the Joint Terminal Evaluation on Japanese technical cooperation project on the Project for Promotion of Sustainable 3R Activities in Maputo (hereinafter referred to as “the Project”) on the basis of the Record of Discussion (hereinafter referred to as “R/D”) signed on November 27, 2012.

During its stay in Mozambique, the Team had a series of discussions and exchanged views with Mozambican officials concerned (hereinafter referred to as “the Mozambican side”).

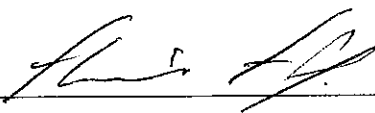
As a result of discussions, both the Mozambican side and the Team (hereinafter referred to as “both sides”) mutually agreed upon the matters referred to in the Joint Terminal Evaluation Report attached as appendixes.

(These documents were done in both English and Portuguese, each text being equally authentic. In case of any divergence of interpretation, the English text shall prevail.)

Maputo, August 19th, 2016



Mr. Daisuke Iijima
Leader, Terminal Evaluation Team
Japan International Cooperation Agency



Mr. Florentino Abilio Geraldês Ferreira
City Councilor of Solid Waste Management
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JOINT TERMINAL EVALUAION REPORT
ON
THE PROJECT FOR PROMOTION OF SUSTAINABLE
3R ACTIVITIES IN MAPUTO
IN
THE REPUBLIC OF MOZAMBIQUE

The Joint Terminal Evaluation Team

Maputo, 19 August 2016

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Appendix I

List of Attendants in Maputo

1. Participants from Mozambican side

(1) Maputo Municipality

Mr. Florentino Abilio Gerald	City Councilor of Solid Waste Management
Ferreira	
Mr. Joao Agostinho Mucavele	Director, Municipal Directory of Urban Solid Waste Management
Mr. Domingos Chivambo	Deputy Director, Municipal Directory of Urban Solid Waste Management
Ms. Luisa Langa Bila	Coordinator of the Planning and Monitoring Department
Mr. Sergio Manhique	Head of the Section of Monitoring and Quality Control

For other participants see Annex 6 of Joint Terminal Evaluation Report

(2) Ministry of Land, Environment and Rural Development

Mr. João Cipriano	Head of Waste management and Green Spaces
Mr. Agostinho Fernando	Technician for Waste Management and Green Spaces

2. Participants from Japanese side

(1) Detailed Survey Team

Mr. Daisuke Iijima	Leader
Mr. Takaaki Murata	Planning Cooperation
Mr. Makoto Tanaka	Evaluation Analysis

(2) JICA Mozambique Office

Mr. Katsuyoshi Sudo	Chief Representative
Ms. Chiharu Morita	Senior Representative
Ms. Makiko Inamori	Project Formulation Advisor

(3) JICA Expert Team

Mr. Shungo Soeda	Chief Advisor
Mr. Takahiro Kamishita	Deputy Chief Advisor

ATTACHED DOCUMENT

I. Terminal Evaluation Report

The Joint Terminal Evaluation Team consisting of Mozambican and Japanese members presented the results of the Joint Terminal Evaluation Report (attached as Appendix II) to the Joint Coordinating Committee (hereinafter referred to as "JCC"). Both sides confirmed that the members of the JCC reviewed and approved its contents of this Terminal Evaluation report.

Appendix I	List of Attendants in Maputo
Appendix II	Joint Terminal Evaluation Report
Appendix III	Project Design Matrix (PDM) Version 5
Appendix IV	Agenda of 7th JCC

Handwritten signature/initials.

Annexes

Annex 1: Schedule of the Japanese Evaluation Team

Annex 2-1: Project Design Matrix (PDM)

Annex 2-2: Plan of Operation (PO)

Annex 3: Record of Expert Assignment

Annex 4: List of Equipment Provided by the Japanese Side

Annex 5: List of Pilot Projects (PP)

Annex 6: List of Counterpart Members

Annex 7: List of Participants of Trainings

Annex 8: List of Joint Coordination Committee (JCC) Meetings

Annex 9: History of revision of PDM

Abbreviation / Acronyms

Abbreviation	English
AMOR	Mozambican Recycling Organisation (NGO)
A/P	Action Plan
CMM	Municipal Council of Maputo
C/P	Counterpart
DAF	Department of Administration and Finance (DMSC)
DGRSU	Department of Management of Urban Solid Waste (DMSC)
DMSC	Directorate for Waste Management and Cemeteries
DPM	Department of Planning and Monitoring (DMSC)
FNDS	National Fund of Sustainable Development (formerly FUNAB)
FUNAB	National Fund of Environment (currently FNDS)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (formerly GTZ)
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (currently GIZ)
ISWM	integrated solid waste management
JCC	Joint Coordinating Committee
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteer
KEXIM	Korea Eximbank (The Export-Import Bank of Korea)
LVIA	Lay Volunteers International Association (NGO)
ME	micro enterprise
MITADER	Ministry of Land, Environment and Rural Development
MM	man-month
M/M	Minutes of Meeting
MOPA	Participatory Monitoring Pilot Project
MOU	memorandum of understanding
M/P	Master Plan
NGO	non-governmental organization
PDM	Project Design Matrix
PNA	National Environmental Policy
PO	Plan of Operation
PP	Pilot Project
PROMAPUTO	Maputo Municipal Development Program (WB)
R/D	Record of Discussion
SWM	solid waste management

UEM	University of Eduardo Mondlane
WB	The World Bank
3R	Reduce, Reuse, Recycle

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Chapter 1 OUTLINE OF THE EVALUATION STUDY

1.1 Introduction

In Mozambique, Maputo city, the capital of the country, enacted the regulation for solid waste management in 1997, and has promoted the solid waste management. However, due to rapid urban population growth, increasing of urban waste, the diversification of types of waste and participation of various actors into solid waste management (Private sector, non-governmental organizations (NGOs), etc.), it has been difficult to manage solid waste properly. Based on above situation, “Master Plan for Solid Waste Management in Maputo Municipality” (hereinafter referred to as “M/P”) was formulated in 2007 by the cooperation with GTZ (currently GIZ).

This M/P points out various challenges in solid waste management. For example, collection rate of the total solid waste is less than 50% in the year of 2007, maintenance and operation of equipment for waste collection is insufficient, the final disposal site has not been managed appropriately and solid waste are scattered throughout the Maputo city. Moreover, M/P indicates a major problem is the low capacity of solid waste management in Maputo Municipality.

Furthermore, proper waste collection services have not existed in surrounding areas of Maputo city and it leads to rapid increase of illegal dumping site and negative impacts on environment and health of residents. In this background, the Maputo Municipality has been working on countermeasure for improvement of solid waste management based on M/P.

However, the institutional vulnerability of Maputo Municipality, particularly technical aspects of solid waste management, obstructs progressing adaption of appropriate waste management. Although, introduction of 3R (Reduce, Reuse, Recycle) has positioned in M/P as an important role for the promotion of comprehensive waste management in the future, there are still many challenges to implement 3R activities.

As a result of these situations, the technical cooperation project “the Project for Promotion of Sustainable 3R Activities in Maputo” (hereinafter referred to as “the Project”), which aims at the improvement of solid waste management and sustainable development of 3R in Maputo Municipality, was requested by the Government of Mozambique.

About three and half years has passed since the Project was launched in March 2013. Considering that the Project will be completed in March 2017, the Terminal Evaluation was conducted with an aim to review activities and outputs which come up in the Project, and to make recommendations on the activities for the remaining period of the Project.

1.2 Objectives of the Evaluation Study

The specific objectives of the Terminal Evaluation are outlined as follows:

- (1) To exchange opinions with counterparts in order to assess the present situations, including

progress and achievements, according to the project plan;

- (2) To review the progress and the accomplishment of the Project in accordance with the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability);
- (3) To identify obstacles and/or facilitating factors that affected the implementation process;
- (4) To discuss with counterparts the results of review and make recommendations
- (5) for the remaining period of the Project;
- (6) To draw the lessons learnt from the project implementation;
- (7) To summarize the results of the study in a Joint Terminal Evaluation Report and share this at a Joint Coordination Committee (JCC) meeting in order to contribute to the better understanding of the achievement of the project outcome as well as the measures to be taken to further improve and sustain the Project.

1.3 Members of the Evaluation Study

The Joint Terminal Evaluation Team (hereinafter referred to as “the Team”) consists of the following members:

(1) Mozambican side

	Name	Position / Affiliation
1	Mr. João Cipriano	Head of Waste management and Green Spaces, Ministry of Land Environment and Rural Development (National Directorate of Environment)
2	Mr. Agostinho Fernando	Technician for Waste Management and Green Spaces, Ministry of Land Environment and Rural Development (National Directorate of Environment)

(2) Japanese side

	Name	Responsibility	Position / Affiliation
1	Mr. Daisuke Iijima	Team Leader	Acting Director, Environmental Management Team 2, Global Environment Department, JICA
2	Mr. Takaaki Murata	Cooperation Planning	Special Advisor, Environmental Management Team 2, Global Environment Department, JICA
3	Dr. Makoto Tanaka	Evaluation and Analysis	Senior Consultant, ICONS Inc.

1.4 Schedule of the Evaluation Study

The evaluation study was implemented from 5th to 19th August 2016 in Mozambique. The schedule is attached as Annex 1.

1.5 Methodology of Evaluation

(1) Process of Evaluation

In the first step, the Team classified the evaluation items based on the Project plan and the information collected during the survey in Japan. The Team then summarized them into a so-called “Evaluation Grid” in order to verify the progress and implementing process of the Project, and to assess the whole project activities in view of the five evaluation criteria provided by JICA, including “Relevance”, “Effectiveness”, “Efficiency”, “Impact”, and “Sustainability” (see Table 1.1). Questionnaires were also prepared, and were distributed to the counterpart researchers and related ministry officers prior to the field survey.

In the second step, the Team carried out the survey in Mozambique to collect the detailed information from project counterparts through questionnaire survey, interview survey, and site visit.

Table 1.1 Five evaluation criteria

Criteria	Viewpoint
Relevance	An overall assessment of whether the project purpose and overall goal are in line with policy of both sides, and with needs of the partner country and the sectors.
Effectiveness	A measure of whether the Project purpose will be achieved by the end of the Project period. This is then a question to the degree to which the Outputs contribute towards achieving the intended Project purpose.
Efficiency	A measure of the production of Outputs (results) of the Project in relation to the total resource Inputs.
Impact	Direct and indirect, positive and negative impacts caused by implementing the Project, including the extent to which the Overall Goal has been attained.
Sustainability	An overall assessment of the extent to which the positive changes achieved by the Project can be expected to last after the completion of the Project.

(2) Data Collection Methods

Evaluation items, necessary data, and evaluation indicators are described in the Evaluation Grid. The following data collection methods were applied to this evaluation: 1) document review; 2) questionnaire survey; 3) interview survey; and 4) site visit.

Chapter 2 OUTLINE OF THE PROJECT

The Projects has been carried out since February 2013. The designed Overall Goal, Project Purpose and Outputs are as follows: The structure of the Project plan is summarized in the Project Design Matrix (PDM) version 4.0, and the schedule of each Activity is in the Plan of Operation (PO). The PDM and PO are listed in Annexes 2-1 and 2-2 respectively.

2.1 Outline of the Project

The followings are the outline of the Project, depending on the current PDM 4.0 that was revised on 10 Jun. 2015.

Overall Goal

The urban environmental and living condition in Maputo City is improved.

Indicator 1: Amount of inadequate waste Management (*1) is decreased.

Indicator 2: Amount of final waste disposal per person is decreased.

Indicator 3: Amount of collected recyclables is increased.

Indicator 4: Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020.

Indicator 5: Satisfaction of citizen for solid waste management is increased.

*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.

Project Purpose

Capacity for Solid Waste Management (SWM) in CMM is improved.

Indicator 1: The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM.

Indicator 2: Average score of capacity assessment achieve at least 3 point of 5 scale evaluation.

Indicator 3: Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period.

Indicator 4: Guidelines of SWM for Maputo city are approved by CMM.

Outputs of the Project

Output 1: Capacity to analyze the current status of SWM in CMM is improved.

Indicator 1-1: CMM understands progress and differences of the current M/P.

Indicator 1-2: CMM understands current status about SWM.

Output 2: Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.

Indicator 2-1: Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area.

Indicator 2-2: Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1.

Indicator 2-3: Problem reports regarding waste collection from the residents and contractors in Maputo city.

Output 3: Capacity for financial management of SWM in CMM is improved.

Indicator 3-1: Financial operation procedure is shared with official document.

Indicator 3-2: Basic Revenue and Cost data is regularly collected and reported.

Indicator 3-3: Annual budget execution rate reaches to 100%±15% in 2015 and 2016.

Indicator 3-4: Sustainable financial management strategy for SWM sector is developed.

Output 4: 3R activities for reduction of solid waste (including private sector) is introduced in project target area.

Indicator 4-1: Educational material about 3R is developed.

Indicator 4-2: New office for civic education is established in DMSC.

Indicator 4-3: 31 primary schools participate in civic education program related 3R through the most creative school contest or other occasions.

Indicator 4-4: Average quantity of recyclables collected per month through PP reaches at least 200kg.

Indicator 4-5: 50% of households who participated the PP for utilization of organic waste continues the activity.

Indicator 4-6: Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2times/year.

2.2 Project Implementing Organizations

The implementing organization in the Mozambican side is the Directorate for Waste Management and Cemeteries (DMSC) of the Municipal Council of Maputo (CMM).

Chapter 3 ACHIEVEMENT OF THE PROJECT

3.1 Inputs

3.1.1 *Japanese side*

(1) Assignment of experts

A total of 9 experts were assigned to the Project, in total 74.88 man-month (MM) till the end of February 2016. The record of assignment is shown in Annex 3.

(2) Trainings in Japan and a third country

The Project held two trainings. The first one was held in Japan from 12 to 27 October 2013 with 8 trainees and the other in Brazil from 26 September to 10 October 2015 with 8 trainees. The latter was originally planned as a training in Japan but changed to a training in a third country. Due to a request by the counterpart members (C/Ps) to see the status in a country other than Japan, Brazil, a Portuguese-speaking country, was selected as the venue. The main topics in the two trainings were "M/P, and legislation", "collection and transportation", "financial and institutional management", "3R and civic education" and "final disposal site and waste pickers" (only in Brazil). The participants of each training is listed in Annex 7.

(3) Provision of equipment and machinery

The Japanese side provided two vehicles and other equipment as listed in Annex 4. It also provided materials necessary for the Project implementation (pilot project (PP) and civic education). The PPs are listed in Annex 5.

(4) Local operation costs spent by the Japanese side

The Japanese side disbursed expenses and local costs as the need arose, such as consumables, fuel costs.

3.1.2 *Mozambican side*

(1) Assignment of counterpart members (C/Ps)

The Mozambican side assigned 7 counterpart members (C/Ps) in the 1st year (except the Project Director and the Project Manager). The number has been gradually increased to 20 at the start of the 4th year. The current C/Ps are listed in Annex 6. Before the start of the Project, it was agreed by the Japanese and Mozambican sides that salaries and allowances of C/P members should be at the own responsibility of the Mozambican side. Daily allowances at the training in the third-party country are paid under the regulation of Maputo city.

(2) Provision of facilities and office spaces

The Mozambican side provided 3 rooms (including 1 for secretaries), each for 4 persons, in the DMSC building and 1 room for 2 persons in the Department of Monitoring and Planning, together with electricity, lighting and air conditioners. Electricity, gas and water supply charges have been basically borne by DMSC. However, the electricity service has often stopped. Each time it stops the JICA Expert Team (JET) has borrowed a meeting room with electricity in a hotel near DMSC by its own expenses.

(3) Costs for the implementation and the management

The Mozambican side disbursed costs for domestic transport and storage of the equipment / machinery. For example, DMSC asked the National Fund of Environment (FUNAB, currently the National Fund of Sustainable Development, FNDS) to disburse costs for the Environmental Fair related to "the Day of Maputo (10 November)". The JET disbursed some part of the costs for event tools, etc.

3.2 Achievement of the Outputs

The status of achievements of the Project Outputs and their indicators as designated in the PDM is shown as follows.

Output 1: "Capacity to analyze the current status of SWM in CMM is improved."	
Degree of achievement by the end of the Project: Already achieved	
Verifiable Indicators	Achievements
1-1 CMM understands progress and differences of the current M/P.	<ul style="list-style-type: none">- The current M/P has been established in 2007 with the assistance by GTZ (currently GIZ). In the 1st year of the Project period, CMM already reviewed it and compared its targets with the actual.- After reviewing, the M/P was revised in 2013. After that, the Action Plan (A/P) was established in 2014. The items in the A/P have been implemented and monitored every 4 months (3 times per year) by using monitoring sheets.- From above, <u>this indicator has already been achieved.</u>
1-2 CMM understands current status about SWM.	<ul style="list-style-type: none">- The C/P members share each of their experiences and knowledges on SWM as follows, through insider discussions.<ul style="list-style-type: none">➤ CMM has conducted civic education campaigns and the pilot projects (PPs) in urban areas of Maputo city.

	<ul style="list-style-type: none"> ➤ CMM implemented a project named Participatory Monitoring Pilot Project (MOPA) at the same time in suburban areas of Maputo city: Polana Canico B, Inhagoia B, Magoanine C and Maxaquene C Bairros. ➤ Through the above PPs and MOPA, the C/P members have direct contacts to current status about SWM. - Chapter 4 “Current Status of SWM in Maputo City” of the M/P is revised mainly by the C/Ps after problematic analysis by utilizing knowledge and experience on SWM acquired through the Project. - Through these activities, CMM understands the current status about SWM. - From above, <u>this indicator has already been achieved.</u>
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In consideration of the achievement of Indicators 1-1 and 1-2, Output 1 has already been achieved.

Output 2: “Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.”											
Degree of achievement by the end of the Project: Already achieved											
Verifiable Indicators	Achievements										
2-1 Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area.	<ul style="list-style-type: none"> - The PP for waste collection and transportation in urban area was implemented its main activity from June 2015 to February 2016. During the activity, the number of critical points of waste collection and illegal dumping is reported by a contractor that joined in the PP and also monitored by the Supervision Section of the Department of Planning and Monitoring (DPM), DMSC. The results are as follows. 										
	<table border="1"> <thead> <tr> <th>Month</th><th>Number reported</th><th>Remarks</th></tr> </thead> <tbody> <tr> <td>Jul. 2015</td><td>452</td><td>Reported by the contractor</td></tr> <tr> <td>Dec. 2015</td><td>272</td><td>Sum of the numbers reported by the contractor and monitored by DMSC</td></tr> </tbody> </table>	Month	Number reported	Remarks	Jul. 2015	452	Reported by the contractor	Dec. 2015	272	Sum of the numbers reported by the contractor and monitored by DMSC	
Month	Number reported	Remarks									
Jul. 2015	452	Reported by the contractor									
Dec. 2015	272	Sum of the numbers reported by the contractor and monitored by DMSC									

	<ul style="list-style-type: none"> - As above, the number reduced by 40% from July to December 2015. The number in July 2015 may be less than the reality, and the reduction rate of 40% may be larger. - DMSC is likely to grasp all critical points through PP activities of urban area. - From above, <u>this indicator has already been achieved.</u>
2-2 Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1.	<ul style="list-style-type: none"> - A PP for segregation of recyclables in suburban area was implemented in Chamanculo D Bairro (district) in the second half of 2014. In this PP, waste was segregated, first collected by micro enterprises (ME) and handed over to a large-scale contractor that plays a role of secondary collection. - This style of waste collection continues with cooperation by MEs even after the intervention to the target area completed at the end of 2014. - From above, <u>this indicator has already been achieved.</u>
2-3 Problem reports regarding waste collection from the residents and contractors in Maputo city.	<ul style="list-style-type: none"> - A System has already been established, in which system problems on the collection and transportation are reported by residents and the contracted private companies. - After the establishment of the Civic Education Office in DMSC in 2014, citizens who have found problems regarding waste collection have been able to report such problems directly to the office. CMM accepts reporting by citizens through the contractors as well. - The waste collection and transportation in urban area have been improved through the implementation of the related PP. This PP proved that strengthened cooperative relation among the related departments of CMM and contractors causes stronger actions to tackle and improve problems regarding waste collection and transportation. - From above, <u>this indicator has already been achieved.</u>

The C/P and related personnel members accumulated their experiences through the implementation of PPs of segregation of recyclables in suburban area and developed their capacity to

find problems and to consider countermeasures against them. In consideration of these facts and the achievement of Indicators 2-1, 2-2 and 2-3, Output 2 has already been achieved, and further developed if DMSC continues the PPs with more intensity.

Output 3: "Capacity for financial management of SWM in CMM is improved."	
Degree of achievement by the end of the Project: Likely to be almost achieved	
Verifiable Indicators	Achievements
3-1 Financial operation procedure is shared with official document.	<ul style="list-style-type: none"> - This is included in the future activities. - The C/P members who are in charge of finance have deeply understood the details of financial management through formulating a guideline on financial operation procedure. - Thus they are ready to formulate a document that describes financial operation procedure as a draft for official document said in the indicator. This task is likely to be completed within the Project period. - From above, <u>this indicator is likely to be achieved.</u>
3-2 Basic Revenue and Cost data is regularly collected and reported.	<ul style="list-style-type: none"> - This is already implemented mainly by the C/Ps. - From above, <u>this indicator has already been achieved.</u>
3-3 Annual budget execution rate reaches to 100%±15% in 2015 and 2016.	<ul style="list-style-type: none"> - In 2015, the annual budget execution rate was 88%. - Since this value was 49%, 137%, 117% and 78% in 2011, 2012, 2013 and 2014 respectively, it is expected from the improving tendency that the value is likely to reach to the designated range. - Budget execution has been visible at any time of each fiscal year. This visualization enables DMSC to grasp the current status of budget execution and to adjust it in the remaining period of the fiscal year. - For example, the value of 56% was reported as budget execution rate in 2016 as of early August. Considering the value reflects the execution for about 7 months, the rate in 2016 is likely to reach very near to 100% at the end of the year. - From above, <u>this indicator is likely to be achieved.</u>
3-4 Sustainable financial management strategy for	<ul style="list-style-type: none"> - This is included in the future activities. - The strategy said in the indicator is likely to be completed within

SWM sector is developed.	<p>the Project period by the same reason as that for Indicator 3-1.</p> <p>- From above, <u>this indicator is likely to be achieved.</u></p>
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The annual budget of 2016 was estimated by the effort of DMSC. A database system has been developed in order to register large-scale waste generators, who pay charge for SWM. In consideration of these facts and the achievement of Indicators from 3-1 to 3-4, Output 3 is likely to be almost achieved within the Project period.

Output 4: "3R activities for reduction of solid waste (including private sector) is introduced in project target area."	
Degree of achievement by the end of the Project: Likely to be achieved	
Verifiable Indicators	Achievements
4-1 Educational material about 3R is developed.	<p>- Education material about 3R has already been developed by 2015.</p> <p>- From above, <u>this indicator has already been achieved.</u></p>
4-2 New office for civic education is established in DMSC.	<p>- The Civic Education Office was established in DMSC in 2014.</p> <p>- At the establishment, 3 C/P members were assigned to the office and 2 members keep working for it. 1 Japanese expert and 2 local experts work in the office together with them. 2 Japan Overseas Cooperation Volunteer (JOCV) members are also allocated.</p> <p>- From above, <u>this indicator has already been achieved.</u></p>
4-3 31 primary schools participate in civic education program related 3R through the most creative school contest or other occasions.	<p>- 31 primary schools participated in civic education program related 3R in 2015.</p> <p>- It is planned to conduct the same program in 2016 as well. Within the Project period, the number of primary schools that participate in the program will reach a certain number that is closer to 53, the number of all primary schools in Maputo city.</p> <p>- From above, <u>this indicator has already been achieved.</u></p>
4-4 Average quantity of recyclables collected per month through PP reaches at least 200kg.	<p>- It was discussed to prepare and operate 3R stations in Zimpeto Bairro (district) among DMSC, the JET and a micro enterprise (ME) that implements primary collection in the bairro. They agreed and signed on a memorandum of understanding (MOU)</p>

	<p>on these activities. This MOU was approved by the Legal Department of CMM.</p> <ul style="list-style-type: none"> - After this MOU, 3R stations were installed and started their operation in Zimpeto Bairro as components of a PP in 2015. However, the operation stopped after several month due to several reasons including lower prices of recycled materials. - It is expected to take a long time and effort to correspond to conditions on restarting 3R stations that were tried in the PP. - During the implementation period of 160 days from 23 September 2015 to 29 February 2016, totally 7,690 kg of recyclables were collected, which is more than 1,400 kg per month. - From above, <u>this indicator has already been achieved</u>. However, it is desirable to restart the 3R stations.
4-5 50% of households who participated the PP for utilization of organic waste continues the activity.	<ul style="list-style-type: none"> - The PP has been implemented in Mahotas and Costa do Sol Bairros, targeting 34 households. - A professor and a student of the University of Eduardo Mondlane (UEM) instructed households who participated in the PP to produce soil conditioner from organic waste. The student graduated from UEM and started to work for the Civic Education Office as a local expert. - In January 2016, the Project asked the participating households whether they will continue the activity after the PP is finished. 33 households (97%) answered that they will continue the activity while 1 household will quit. - In August 2016, the same question was asked to the 34 target households. 20 households (59%) answered in the affirmative. - There exists a demand for soil conditioner because many people grow edible plants in small scale farmyards and residential gardens while most part of the land surface in Maputo city is covered with sand that is not suitable for plantation. - From above, <u>this indicator is likely to be achieved</u>.
4-6 Workshops for 3R promotion in Maputo	<ul style="list-style-type: none"> - Workshops for 3R promotion have already been conducted 6 times since 2013 as listed below, with the participation of the

City inviting concerning private institutions and NGOs are held regularly at least 2times/year.	<p>private sector including cooperatives, NGOs, enterprises and MEs.</p> <ul style="list-style-type: none"> ➤ 1st 3R Workshop: 28 Nov. 2013. Main topics: waste flow. ➤ 2nd 3R Workshop: 17 Feb. 2014. Main topics: waste flow. ➤ 3rd 3R Workshop: 2 Jul. 2014. Main topics: promotion of 3R. ➤ 4th 3R Workshop: 8 Dec. 2014. Main topics: the PP for biodegradable organic waste. ➤ 5th 3R Workshop: 12 Feb. 2015. Main topics: outcome of the PP for biodegradable organic waste. ➤ 6th 3R Workshop: 4 Aug. 2015. Main topics: the PPs for organic waste and for 3R. ➤ 1st 3R Forum: 9 Dec. 2015. Main topics: the PP for organic waste, and presentations by the Project and by local NGOs. <ul style="list-style-type: none"> - Since topics in the workshops increased, the term “workshop” is replaced by “forum”. The latter is considered to be an expanded workshop. - Workshops or forums will be held for 2 times as listed below. <ul style="list-style-type: none"> ➤ 2nd 3R Forum: beginning of Sep. 2016. Main topics: discussion of draft the 3R guideline. ➤ 3rd 3R Forum: by the end of Dec. 2016. Main topics: discussion on 3R part of the M/P 2017. - From above, <u>this indicator has already been achieved.</u>
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In consideration of the achievement of Indicators from 4-1 to 4-6, Output 4 is likely to be achieved within the Project period.

3.3 Achievement of the Project Purpose

Project Purpose: “Capacity for Solid Waste Management (SWM) in CMM is improved.”	
Degree of achievement by the end of the Project: Likely to be achieved	
Verifiable Indicators	Achievements
1. The M/P for post-termination of the Project including plans	<ul style="list-style-type: none"> - The formation of the M/P is not delayed much and will be drafted by November 2016. - The draft M/P will be submitted to the Councilors’ Meeting by

to promote sustainable 3R activities is approved by CMM.	<p>the end of November 2016, discussed for about a month and confirmed and approved by the end of December 2016. Then the draft will be submitted to the Assembly of the Municipality and discussed in its monthly congress in January 2017. Since in most cases this kind of discussions will take about 2 weeks, the M/P will be finally confirmed and approved by the end of January 2017.</p> <ul style="list-style-type: none"> - Since there is seen no obstructing factor, it may not need a long time for the approval of the M/P. - From above, <u>this indicator is considered to be achieved</u>, if the approval is smoothly processed. 														
2. Average score of capacity assessment achieve at least 3 point of 5 scale evaluation.	<ul style="list-style-type: none"> - The Project planned to assess the capacity of the C/Ps by using capacity assessment sheets. A set of assessments was carried out in February 2016. The results are listed below. <table border="1"> <thead> <tr> <th>Topics</th><th>Average scores</th></tr> </thead> <tbody> <tr> <td>Current Status Analysis Capacity Development (Output 1)</td><td>3.80</td></tr> <tr> <td>Urban Area Collection & Transportation Capacity Development (Output 2-1)</td><td>3.13</td></tr> <tr> <td>Suburban Area Collection & Transportation Capacity Development (Output 2-2)</td><td>3.78*</td></tr> <tr> <td>Financial Management Capacity Development (Output 3)</td><td>3.86</td></tr> <tr> <td>Introducing Capacity of 3R Activities (Output 4-1)</td><td>3.11</td></tr> <tr> <td>Public Awareness Raising Capacity for 3R Introduction (Output 4-2).</td><td>4.33</td></tr> </tbody> </table> <p>*excluding questions for activities that have not started yet.</p> <ul style="list-style-type: none"> - Assessment will be carried out again in the same method from December 2016 to January 2017. Judging from the past results above, it is probable to be achieved. - From above, <u>this indicator is likely to be achieved</u>. 	Topics	Average scores	Current Status Analysis Capacity Development (Output 1)	3.80	Urban Area Collection & Transportation Capacity Development (Output 2-1)	3.13	Suburban Area Collection & Transportation Capacity Development (Output 2-2)	3.78*	Financial Management Capacity Development (Output 3)	3.86	Introducing Capacity of 3R Activities (Output 4-1)	3.11	Public Awareness Raising Capacity for 3R Introduction (Output 4-2).	4.33
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Financial Management Capacity Development (Output 3)	3.86														
Introducing Capacity of 3R Activities (Output 4-1)	3.11														
Public Awareness Raising Capacity for 3R Introduction (Output 4-2).	4.33														

3. Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period.	<ul style="list-style-type: none">- There has been a permanent and constant sharing of the actions that have been conducted under the scope of the M/P revision, through seminars, workshops, Progress Meetings and JCC.- The Guideline will be drafted by the end of August 2016. Then the A/P and M/P will be drafted by the end of November 2016.- Workshops will be held for 3 times as shown below, with the involvement of the Department of Administration and Finance (DAF) of DMSC, private companies and NGOs, for the purpose of discussing the Guidelines, the A/P and the new M/P. <table><tr><th>Time</th><th>Workshops</th><th>Involvement</th></tr><tr><td>Beginning of Sep. 2016</td><td>Workshop on 3R guideline (as a part of 3R Forum)</td><td>Private enterprises and NGOs who deal with 3R activities</td></tr><tr><td>End of Oct. - end of Nov. 2016</td><td>Workshop on Draft M/P</td><td>Mozambican JCC members</td></tr><tr><td>By the end of Dec. 2016</td><td>Workshop on submitted M/P (together with 3R workshop)</td><td>Mozambican JCC members</td></tr></table> <ul style="list-style-type: none">- From above, <u>this indicator is likely to be achieved.</u>	Time	Workshops	Involvement	Beginning of Sep. 2016	Workshop on 3R guideline (as a part of 3R Forum)	Private enterprises and NGOs who deal with 3R activities	End of Oct. - end of Nov. 2016	Workshop on Draft M/P	Mozambican JCC members	By the end of Dec. 2016	Workshop on submitted M/P (together with 3R workshop)	Mozambican JCC members
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End of Oct. - end of Nov. 2016	Workshop on Draft M/P	Mozambican JCC members											
By the end of Dec. 2016	Workshop on submitted M/P (together with 3R workshop)	Mozambican JCC members											
4. Guidelines of SWM for Maputo city are approved by CMM.	<ul style="list-style-type: none">- A draft of the Guidelines of SWM is under preparation and will be formulated by the end of August 2016.- The main Guidelines will be reflected in the M/P which will suggest specific aspects such as changes in the municipal ordinance and sensitization for the public participation.- The draft Guideline will be submitted to the Councilors' Meeting by the end of September 2016, discussed for about a month and confirmed and approved by the end of October 2016. Then the draft will be submitted to the Assembly of the Municipality and discussed in its monthly congress in November 2016. Since in most cases this kind of discussions will take about 2 weeks, the Guideline will be finally confirmed and approved by the end of												

	<p>November 2016.</p> <p>- From above, <u>this indicator is likely to be achieved.</u></p>
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In consideration of the achievement of Indicators 1, 2, 3 and 4, the Project Purpose is likely to be achieved within the period of the Project.

3.4 Possible Achievement of the Overall Goal

Overall Goal: "The urban environmental and living condition in Maputo City is improved."	
Degree of achievement by the end of the Project: Expected to be achieved	
Verifiable Indicators	Achievements
<p>1. The number of reports on inadequate waste management (*1) is decreased.</p> <p>*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.</p> <p>Note: Verifiable Indicators was revised at the terminal evaluation mission.</p>	<ul style="list-style-type: none"> - CMM will acquire the data of inadequate waste management through the supervision activities by DPM and reports from the contractors that are in charge of waste collection and transportation. The past data and future estimations will be described in the new M/P together with target values. - MOPA started in 2014, targeting 4 suburban bairros. It is planned to expand its activities to the whole city in 2017. This will also help reducing inadequate waste management. - The PP for waste collection and transportation in urban area resulted in the decrease of such cases (see Indicator 2-1 of Output 2). Continuous activities will enable reducing the cases of inadequate waste management. Ongoing civic education activities will also contribute. - From above, <u>inadequate waste management is expected to be decreased.</u>
<p>2. Amount of final waste disposal per person is decreased.</p>	<ul style="list-style-type: none"> - According to DMSC, daily average of the amount of final waste disposal was 875 t/day in 2015 and 890 t/day from January to June 2016. Divided by the number of population, the amounts per person in those periods are 0.70 and 0.71 kg/person/day respectively. No clear change is seen. - The waste generated in Maputo city is collected, transported and finally disposed at Hulene dumping site. Though the accurate amount of final waste disposal at Hulene is not available because

	<p>the weigh bridge (truck scale) at its entrance is broken, it can be estimated from the number of trucks that transported waste to the site. It is requested to repair the weigh bridge as soon as possible.</p> <ul style="list-style-type: none"> - If the amount of generated waste per person is constant, current efforts for recycling will contribute to increasing amount of recycled waste and to decreasing amount of final waste disposal. - From above, <u>this indicator is expected to be achieved.</u>
3. Amount of collected recyclables is increased.	<ul style="list-style-type: none"> - The amount of collected recyclables was reported as 191t in 2010 by registered recycling companies. In 2012, 121t of recyclables and 143t of compost material were collected. - The amount of collected recyclables is likely to be incorporated in the new M/P and A/P. The data on this indicator will be available in annual reports by registered recycling entities from 2017. - The Project will invite registered recycling entities to the next 3R Forum (see Indicator 4-6 of Output 4) and request them to disclose the data of amount of recyclables they collected. Moreover, DMSC is planning to organize the 3R Forum periodically after the Project completion. - From above, <u>this indicator is expected to be achieved.</u>
4. Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020.	<ul style="list-style-type: none"> - It is currently discussed that the annual satisfactory surveys on public services by CMM would include the rate of residents who understand the definition of 3R and engage 3R activities. - If the rate is surveyed, the data will be collected by the Civic Education Office. The rate in 2016 will be available by the end of the Project period. After that, the Project is requested to fix "X%" in 2020. - 3R will be described in the new M/P and A/P, which will be announced to public after its approval. - 3R promotion is ongoing through civic education in primary schools (see Indicator 4-3 of Output 4), and also will be broadcasted in television programs. - From above, <u>residents who understand the definition of 3R and engage 3R activities are expected to increase.</u>

<p>5. Satisfaction of citizen for solid waste management is increased.</p>	<ul style="list-style-type: none"> - As described above, CMM implements satisfactory surveys on public services every year. These surveys request the answerers to rank public services such as electricity supply, water supply, public security and traffic jam, etc. by that they are not satisfied in them. According to these surveys, SWM was ranked 1st, i.e. SWM was the most unsatisfactory public service by 2013, but ranked 4th in 2015. These results might mean that SWM in Maputo city was improved. - From above, <u>this indicator is likely to be achieved</u> with the effort of the C/Ps.
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In consideration of these facts and the achievement of Indicators from 1 to 5, the Overall Goal is expected to be achieved by concrete outcomes by actions following the Master Plan (M/P) and the Action Plan (A/P) which will be formed in the Project. If all items in the A/P are implemented properly, the Overall Goal will be achieved. Since the A/P will deal with the period of 5 years from 2017 to 2022, it may be appropriate to judge the achievement of the Overall Goal at the end of this period.

Chapter 4 PROJECT IMPLEMENTATION PROCESS

4.1 Revision of the Project Plan

Though the basic contents of the plan has not been revised, the PDM was revised for 3 times as shown in Table 4.1. These revisions were for the purpose of making the indicators of the Overall Goal, the Project Purpose and the Outputs concretized and appropriate. They were put into force after the Japanese and Mozambican sides discussed and agreed.

All revisions of indicators are relevant to the then situation such as degree of progress and accumulated information on local situation. There is no willingness to make the achievement of the Overall Goal, the Project Purpose and the Outputs easier in terms of indicators but to make it clearer and more concrete. Each provision was after discussions in daily communication and progress meetings held every two weeks between the Japanese and Mozambican sides, and approved and announced by both the Japanese and Mozambican sides in Joint Coordinating Committee (JCC) meetings as listed in Annex 8. The history of revision of PDM is summarized in Annex 9.

Table 4.1 Revision of the PDM

Date	PDM Ver.	Contents of revisions	Remarks
17 Jul. 2012	PDM1.0	<ul style="list-style-type: none"> - There were 2 indicators of the Overall Goal. - There were 3 indicators of the Project Purpose. - There were 2 indicators of Output 1. - There were 4 indicators of Output 2. - There was 1 indicator of Output 3. - There were 4 indicators of Output 4. 	—
27 Jun. 2014	PDM1.0 → PDM2.0	<ul style="list-style-type: none"> - Indicator 1-2 of Output 1 was corrected. - Indicator 3-1 (1.0) of Output 3 was divided into Indicators 3-2 and 3-3 (2.0). - Indicators 3-1 (2.0) of Output 3 	<ul style="list-style-type: none"> - The Indicators of Outputs 3 and 4 were concretized. ➤ As for Output 3, Indicator in PDM1.0 was unavailable, and replaced because the balance of revenue and disbursement was

		<p>was added.</p> <ul style="list-style-type: none"> - Indicator 4-2 of Output 4 was corrected. 	<p>considered to be important.</p> <ul style="list-style-type: none"> ➤ As for Output 4, establishment of the Civic Education Office was thought to be more appropriate as indicators than the capacity, which had been already acquired. - This revision was approved in the 3rd JCC meeting on 9 June 2014 and put into force on 27 June 2014.
27 Nov. 2014	<p>PDM2.0 → PDM3.0</p>	<ul style="list-style-type: none"> - Indicators 3, 4 and 5 of the Overall Goal were added. - Indicators 2 and 3 of the Project Purpose were corrected. - Indicator 4 of the Project Purpose was added. - Indicator 2-2 of Output 2 was corrected. - Indicators 2-3 and 2-4 (2.0) of Output 2 were deleted. - Indicators 2-3 and 2-4 (3.0) of Output 2 were added. - Indicator 3-2 of Output 3 was corrected. - Indicator 3-3 (2.0) was deleted. - Indicators 3-3 and 3-4 (3.0) of Output 3 was added. - Indicators 4-3 and 4-4 (2.0) of Output 4 were deleted. - Indicators from 4-3 to 4-6 (3.0) of Output 4 were added. 	<ul style="list-style-type: none"> - Several items to be clarified were pointed out in the Mid-term Review. - It was clarified if the Overall Goal is achieved or not by adding the followings. <ul style="list-style-type: none"> ➤ Amount of collected recyclables ➤ Rate of residents who understand the definition of 3R and engage 3R activities. ➤ Satisfaction of citizen for SWM. - The Indicators of the Project Purpose and Outputs 2, 3 and 4 were concretized. <ul style="list-style-type: none"> ➤ As for the Project Purpose, a term "3R system" in PDM2.0 seemed unclear and was replaced by results of capacity assessment. ➤ As for the Project Purpose, development of documents in PDM2.0 seemed activities rather than indicators, and replaced by approval of such documents. ➤ As for Output 2, the contract of waste collection and transportation was renewed. ➤ As for Output 3, all departments in DMSC started to estimate the budget

			<p>for their own tasks. Then 100% of annual budget execution rate became realistic.</p> <p>➤ As for Output 4, the Project started activities of civic education at schools, and the PPs for recyclables and for organic wastes.</p> <p>- This revision was approved in the 4th JCC meeting.</p>
10 Jun. 2015	PDM3.0 → PDM4.0	<ul style="list-style-type: none"> - Indicator 1 of the Overall Goal was corrected. - Indicator 2 of the Project Purpose was corrected. - Indicator 2-1 of Output 2 was corrected. - Indicators 2-3 and 2-4 (3.0) of Output 2 were deleted. - Indicator 2-3 (4.0) of Output 2 was added. - Indicators 4-2, 4-3 and 4-6 of Output 4 were corrected. - Indicator 4-4 (3.0) of Output 4 was deleted. - Indicator 4-4 (4.0) of Output 4 was added. 	<ul style="list-style-type: none"> - The Indicators of the Overall Goal, the Project Purpose and Outputs 2 and 4 were concretized. ➤ As for Output 2, the waste collection and transportation are implemented in different methods in the urban and suburban areas, and the Civic Education Office was established. ➤ As for Output 4, the number of households who conduct segregation was unavailable before 2015. - This revision was approved in the 5th JCC meeting.

4.2 Impeding Factors

4.2.1 *Fallen prices of recycled materials*

At the beginning of the Project, the international price of petroleum was higher than USD 100 per barrel. However, it started to rapidly fell down in 2014 and 2015 to about USD 30 - 40 per barrel. The prices of recycled plastics decreased in connection with petroleum. Due to the fallen prices, the chain of recycling of plastics came to stop. In fact, the 3R station that was installed in the 3R PP was suspended.

4.2.2 *Financial crisis in 2016*

A financial crisis happened in early 2016. This crisis caused a serious damage to the finance of the Government of Mozambique. CMM is also affected by the crisis and is forced to reduce its budget for any budgetary categories. Budget for SWM is not exceptional and expected to be reduced mainly in the portion of 3R.

4.3 Promoting Factors

4.3.1 *Close communication between the JET and the C/Ps*

The JET and the C/Ps hold progress meetings every two weeks to exchange and share information on the Project in addition to daily communication. They have tackled the problem of the lack of common languages by the effort of local experts who speak English. The progress meetings were held among the related departments of DMSC even in the absence of the JET. They started to share necessary information. Thanks to these efforts, the C/P members have grasped the own roles.

4.3.2 *Contributions by the contractors in charge of waste collection and transportation*

The contractors in charge of waste collection and transportation are trying to find critical points of waste collection and illegal dumping in addition to their routine works. They also help residents report such problems to CMM. These efforts contributed to smoother operation of the system of problem reports regarding waste collection.

Chapter 5 EVALUATION BY FIVE CRITERIA

5.1 Relevance

The Relevance of the Project is evaluated as high.

5.1.1 *Necessity and priority*

The Project Purpose corresponds with the needs of the Mozambican side. The National Environmental Policy (PNA, 1995) declares that Mozambique needs to accelerate SWM with introduction of recycle system, construction and management of sanitary landfills, etc. The National Strategy of Integrated Management of Urban Solid Wastes (2012) mentions the 3R would be introduced by 2025, where active involvement of local people and community based organizations (CBO) would play important roles.

The Project Purpose also corresponds with the needs of the target area and society. CMM established the M/P (2007) with the aid of GTZ (then). It states that introduction of 3R is necessary for promoting integrated solid waste management (ISWM). Since Maputo city has been rapidly developing with much more population and waste, the M/P is partly estranged from the current status and required to be modified.

5.1.2 *Coherency with Japan's policies*

Japan's Country Assistance Policy for Mozambique (Mar. 2013) states that Japan contributes improvement of environmental quality in urban areas. It says "to assist environmental countermeasures represented by the improvement of waste disposal capacity in urban areas, while environmental pollution is a cause to damage the municipal function".

In Japan's ODA Rolling Plan for Mozambique (April 2015), the Project is positioned in "the Maputo Corridor Development and Rehabilitation Program" (Establishment of a development plan, construction of infrastructures and technical assistance are to be implemented, in order to strengthen the municipal function of Maputo city, the capital, which will be a gateway of the Maputo Corridor that leads to the Republic of South Africa.), in Development Issue 1-1 (minor issue) "Assistance for the development of the corridors".

5.1.3 *Relevance of the approach*

The Project utilized the experiences of the Japanese experts in the following projects.

- Technical Cooperation Project: Palau "Improvement on Solid Waste Management in the Republic of Palau" (Oct. 2005 – Oct. 2008) ... Establishment of M/P, 3R and civic education
- Preparatory Study: Kenya "Construction of a Waste Disposal Landfill in Nairobi city" (under preparation) ... Review of the plan by the Export-Import Bank of Korea (KEXIM, or Korea

Eximbank), advices to C/Ps

- Development Study: Nepal “The study on the solid waste management for the Kathmandu Valley” (Jan. 2004 – Mar. 2007) ... Capacity development, waste collection and transportation plan
- Technical Cooperation Project: Cuba “Improvement of the Capacity on Urban Solid Waste Management in Havana city, the Republic of Cuba” (Sep. 2009 – Sep. 2014) ... Method of intervention to recyclable collection PP
- Technical Cooperation Project: Vietnam “Implementation support for 3R INITIATIVE of Hanoi city for Cyclical Society” (Nov. 2006 – Nov. 2009) ... Same as above

5.2 Effectiveness

The Effectiveness of the Project is evaluated as relatively high.

As discussed in 3.3, the Project Purpose is likely to be achieved within the period of the Project. Most of the planned capacity development has been achieved and contributed to the achievement of the Project Purpose.

All the four Outputs contribute to the achievement of the Project Purpose. This is because the plan of the Project has a logical structure.

However, the effectiveness of SWM policies may not be enough due to the lack of compulsion in them. Monitoring in the initial stage is important.

5.3 Efficiency

The Efficiency of the Project is evaluated as relatively high.

All the 4 Outputs of the Project have been achieved, almost achieved or are likely to be achieved within the period of the Project. Almost all inputs of human resources, technology transfer activities, facilities, equipment, consumables, etc. surely contributed to the achievement of the Outputs.

However, there is seen slight inefficiency in time. For example, the PP for 3R stations suspended due to several external conditions. CMM is making effort for restarting by implementing 3R promotion activities in primary schools, and supporting a recycling system named Ecoponto (eco-point).

5.4 Impact

The Impact of the Project is relatively high.

As described in 4.5, the Overall Goal is expected to be almost achieved by actions following the M/P and the A/P which will be formed in the Project. However, it is possible to take more than about 3 years for the achievement.

In addition, the following positive effects are seen.

- The Office of Civic Education, which was established in the Project, not only implements awareness raising and environmental education for inhabitants of which DMSC is in charge, but also contributes to related awareness raising activities of which departments of CMM other than DMSC are in charge.
- The Project is expected to have good effects as a concrete novel case for the Ministry of Land, Environment and Rural Development (MITADER), the ministry in jurisdiction of SWM and promotion of 3R, to implement national policies.
- Positive effects are expected, e.g. to share the experiences of Maputo city with the country and other local governments. Activities by the initiative of Maputo city have been already started, such as holding the Seminar on SWM in the Southern Areas.

No negative effects and influences are seen.

5.5 Sustainability

The Sustainability of the Project is evaluated as relatively low from the following discussion. The financial aspects makes the effect of the Project less sustainable.

5.5.1 Policy and institutional aspects

The Sustainability of the Project is evaluated as relatively high in policy and institutional aspects. There is a high possibility for continuation.

- MITADER makes promotion of 3R policies as its basic direction.
- The experiences of MITADER on implementation of national policies and strategies are not yet sufficient. Since the experiences of Maputo city are valuable for monitoring, forming and revising related regulations, it is expected that the assistance for policies continues.
- The current President visited Maputo in 2016 and commented “Making a pure and clean city is a basis for promoting sightseeing in Maputo city and Mozambique”.
- Though the priority of SWM is often set lower in least developed countries among many development issues, Mozambique regards SWM as one of the most important issues and tackles problems in the waste sector.

5.5.2 Organizational aspects

The Sustainability of the Project is evaluated as high in organizational aspects.

There is a high possibility that the cooperation among the related entities (CMM and MITADER, etc.) continue after the end of the Project because of the followings.

- The Mayor of Maputo city keeps high interests for the Project.
- To minimize the influence of the completion of Maputo Municipal Development Program II (PROMAPUTO II) by the World Bank (WB, 2016), tackling by the whole municipality is indispensable.
- The judgement that the results of the Project should be officially approved is by the own thought of DMSC.
- Though the priority of SWM is often set lower in least developed countries among many development issues, Mozambique regards SWM as one of the most important issues and tackles problems in the waste sector.

5.5.3 *Financial aspects*

The Sustainability of the Project is evaluated as relatively low in financial aspects.

The budget for continuing activities of the Project does not seem secured. The financial source is clearly short for increased maintenance and transportation costs that will be necessary after the operation of the new sanitary landfill in Matola city starts. The financial source is short for promoting 3R policies by the public sectors (expenses for required facilities and equipment, subsidies, etc.). The setup to monitor financial management is not clear while it will be necessary to monitor it so that makes the Project effects sustainable.

In addition, it is apprehensive that the execution of budget for the Project by CMM becomes difficult if the economic and financial situation becomes worse.

5.5.4 *Technical aspects*

The Sustainability of the Project is evaluated as high in technical aspects.

CMM has enough capacity to revise by itself the policy, standards, guidelines and other tools if necessary. DMSC has already implemented monitoring of the existing M/P by its own effort. However, external support is thought to be necessary for it to implement many items in expertized and technically correct ways. As for awareness raising of inhabitants and environmental education, the monitoring and evaluation by collaborative efforts are thought to be available because the dispatch of JOCV is planned to continue for a while. It is desirable to try to firmly establish the experiences and disseminate them to other cities by further assistance.

The related ministries (MITADER, etc.) have enough capacity to technically contribute to the dissemination of the experience and knowledge acquired in the Project. DMSC of Maputo city is trying to lead the Southern areas and the country as the department of the capital in charge of SWM. It has already started and will continue to share the results of awareness raising with the Municipality of Matola. MITADER refers them as well.

5.5.5 *Society, culture and environmental aspects*

The Sustainability of the Project is evaluated as high in society, culture and environmental aspects.

No factors are seen that obstruct the Sustainability in society, culture and environmental aspects. Consideration to vulnerable risk groups (absolute poor, aged, disabled, jobless and waste pickers, etc.) is paid. Collaborative works with socially vulnerable people have been promoted in existing activities on collection of recyclables by related NGOs. Social surveys on waste pickers, etc. was implemented for the closure of existing Hulene dumping site. The civic education plan designates risk groups as main stakeholders. There have been no activities that are worried to badly affect socially vulnerable people.

Chapter 6 CONCLUSIONS

Based on the above findings and evaluation, the Team concludes as follows.

- The Project realized a significant improvement in the capacity of CMM in SWM, by making the Project Purpose likely to be achieved within the Project period.
- As for the Outputs, Outputs 1 and 2 have already been achieved, Output 3 is likely to be almost achieved and Output 4 is likely to be achieved.
- As for the five evaluation criteria, the Relevance of the Project is evaluated as high, the Effectiveness, the Efficiency and the Impact relatively high, while the Sustainability is evaluated as relatively low in terms of financial aspects.

Chapter 7 RECOMMENDATIONS

(1) Ensuring the approval of new M/P and guidelines on SWM for Maputo city

Indicator 1 and 4 of the Project Purpose, namely the approval of the new M/P and the guidelines on solid waste management for Maputo city, need to be fulfilled before the completion of the Project in order to achieve the project purpose.

Therefore, the team recommends that CMM/DMSC should clarify the approval procedure and set the timeline of its process for the new M/P and the guidelines of Maputo city, and ensure completion of the process within the project period.

(2) Securing of financial sustainability

The team concluded financial sustainability is the most essential factor to ensure the sustainability of proper service since following risks are foreseen.

- ✓ PROMAPUTO II (2016), which is a financial assistance from the World Bank and account for 30% of the budget, will complete in 2016.
- ✓ After the new sanitary landfill site in Matola is constructed, Maputo city needs an additional budget for the waste transportation and management of the landfill site.
- ✓ Maputo city needs the additional budget for the closure of the existing Hulene dumping site.

Therefore, the team recommends that CMM/DMSC should make an effort to increase its revenue or relevant measures to be considered to secure the financial sustainability. For example, to conduct strict collection of cleaning tax from the large-scale waste generators would be high priority, which are not collecting thoroughly at the moment.

(3) Immediate repair and appropriate management of weigh bridge in Hulene dumping site

In Hulene dumping site, a weigh bridge (truck scale) has been used inappropriately by the private contractors, and it have been broken down for some months, the resulting accurate amount of final waste disposal has not been measured in Maputo city.

Therefore, the team recommends that CMM/DMSC should repair the weigh bridge as soon as possible and instruct the private contractors to use in appropriate manner, for monitoring amount of final waste disposal in Maputo city.

(4) Early and smooth transition to the new sanitary landfill site in Matola city

The Hulene dumping site in Maputo city is already beyond its capacity, and might hinder proper waste collection/transportation and then increase risk of illegal dumping when this situation lasts for a long period. On the other hand, a new sanitary landfill site in Matola City is planning to be constructed by 2018 under the scheme of ODA loan together with technical support by Korea

Eximbank.

Therefore, the team recommends that CMM/DMSC should ensure the closure of the existing Hulene dumping site and the opening of the new landfill site as scheduled.

(5) The revision of the Indicator 1 of the Overall Goal and its Means of Verification

Indicator 1 of the Overall Goal requires the amount of inadequate waste management for the achievement. However, the collection of data including the amount of illegal dumping is very difficult since there are no means of measure for its quantity.

C/P and JET have agreed that the indicator is replaced from “the amount of inadequate waste management” to “the number of reports on inadequate waste management” by DMSC’s supervision section and the private contractors, and replace its means of verifications accordingly. In addition, the baseline data would be obtained within the project period and report to JICA.

(6) Obtaining the baseline Data of the Indicator 3 for the Overall Goal within the project period

Indicator 3 of the Overall Goal requires the amount of collected recyclables for the achievement. However, it is difficult to obtain the baseline data and to verify the Indicator because the data has been not included in the Annual Social Survey of CMM.

Therefore, C/P and JET are recommended to obtain the baseline data in the 3R forum which will be held within the project period, and to report the data to JICA.

(7) Consideration of the revision of the Indicator 4 for the Overall Goal within the Project Period

Indicator 4 of the Overall Goal includes unfixed numbers in its statement “Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020.” However, the results of this mission’s survey showed that it is difficult to determine the unfixed numbers.

Therefore, C/P and JET are recommended to consider revision of the Indicator and clarify its means of verification. Its baseline data should be obtained within the project period and reported to JICA.

(8) Continuing the Capacity Building Activities among DMSC and Sharing its Experience to CMM and Other Cities

The Project achieved significant development of C/P’s capacity in SWM and 3R through the activities in the Project. The staffs of DMSC acquired the capacity to hold the workshop by themselves. Moreover, the training in Japan in 2013 had a positive impact toward their operation,

that is, the establishment of the Civic Education Office in DMSC.

Therefore, DMSC is recommended to develop C/P's capacity continuously and share CMM and other cities with the experiences for improving SWM in Mozambique.

(9) Estimating SWM Costs after Katembe is Connected to the Mainland with a Bridge

A new connection bridge between Maputo urban area and Katembe will be completed within a couple of years, and cause drastic increase of Katembe's population, and DMSC should cover the costs for waste collection/transportation from Katembe.

Therefore, DMSC is recommended to estimate SWM costs after the bridge is completed.

Chapter 8 LESSONS LEARNED

(1) Effective Utilization of Counterpart Training

Meeting with the needs and the situation of the C/P contribute to success of a project. In fact, in case of the Project, the trainings provided the C/P with the opportunities to observe actual SWM in Japan, particularly in Tajimi city, which is in the similar level of manpower as Maputo city. The observation and learnings in Japan led to establish the Civic Education Office in the DMSC because they realized the importance of civic education for SWM.

(2) Careful Identification of the Project Risk

In developing countries, the sustainability of material recycle tends to depends on the material price and the existence of recycling industry. In fact, according to MITADER, metal and paper are not recyclable and exported overseas because of a lack of local market for them in Maputo city, and only plastics are recyclable in Maputo city.

Material price and recycling industry should be identified as Indicator on a PDM when the sustainability recycle activities are required as External conditions.

Annex 1: Schedule of the Japanese Evaluation Team

Date	Activities
5 Aug. (Fri.)	[Dr. Tanaka] 10:45 Arrival at Maputo (SA142) 13:30-14:30 Meeting with the Mozambican Evaluation Team 15:00-16:00 Meeting with the JET 16:30-17:00 Meeting with JICA Mozambique Office
6 Aug. (Sat.)	Analysis of the survey
7 Aug. (Sun.)	Analysis of the survey
8 Aug. (Mon.)	10:00-12:00 Interview with Mr. Florentino Galdes Ferreira, city Councilor 13:00-14:30 Interview with Mr. Shungo Soeda, Chief Advisor 14:40-15:40 Interview with Mr. Takahiro Kamishita, Sub-chief Advisor 16:00-17:40 Interview with Mr. João Agostinho Mucavele, Director
9 Aug. (Tue.)	09:00-10:00 Interview with Output 1 members 10:30-11:30 Interview with Output 2 members 13:30-15:00 Interview with Output 3 members 15:00-16:00 Interview with Mr. Choshin Haneji, Japanese Expert 16:00-17:00 Interview with Mr. Tomoyuki Hosono, Japanese Expert
10 Aug. (Wed.)	09:00-10:00 Interview with Wiriyamu Primary School (Zimpeto Bairro) 10:30-11:30 Interview with Unidade 29 Primary School (Benfica Bairro) 13:00-14:30 Interview with Output 4 members 16:00-16:30 Interview with Mr. Mario Fijamo, Local Expert (alumnus of UEM)
11 Aug. (Thu.)	09:30-10:30 Interview with MITADER 11:00-12:00 Interview with Reciplastico (recycling cooperative) [Mr. Murata] 10:45 Arrival at Maputo (SA142) 14:00-16:00 Meeting with JICA Mozambique Office
12 Aug. (Fri.)	09:00-10:00 Interview with AMOR (NGO) 14:00-15:00 Interview with Korea EximBank 15:30-16:30 Interview with LVIA (Italian NGO)
13 Aug. (Sat.)	Analysis of the survey
14 Aug. (Sun.)	[Mr. Iijima] 10:45 Arrival at Maputo (SA142) 13:30-15:30 Visit to Hulene dumping site 16:00-19:00 Internal meeting
15 Aug. (Mon.)	08:30-12:00 Discussion with the JET 13:00-14:00 Visit to Ecoponto (waste collection company) [Mr. Iijima and Mr. Murata] 14:30-18:00 Presentation by C/P members [Dr. Tanaka] 14:50-15:40 Interview with the World Bank (WB)
16 Aug. (Tue.)	09:00-12:00 Evaluation Team Meeting 15:30-16:00 Courtesy call to the Mayor of Maputo [Mr. Iijima] 16:30-17:00 Visit to EcoLife collection work
17 Aug. (Wed.)	10:30-12:30 Discussion on the draft of Joint Evaluation Report with C/P 14:00-16:00 Discussion on revision of PDM with C/P and the JET
18 Aug. (Thu.)	10:00-11:00 Evaluation Team Meeting AM/PM: Finalizing the Joint Evaluation Report
19 Aug. (Fri.)	09:00-12:00 JCC and signing on the Minutes of Meeting (M/M) 14:00-15:00 Reporting to the Embassy of Japan in Mozambique 16:30-17:30 Reporting to JICA Mozambique Office
20 Aug. (Sat.)	11:30 Departure from Maputo (SA143)

Annex 2-1: Project Design Matrix (PDM)

Project Design Matrix (PDM)

Project Title: The Project for Promotion of Sustainable 3R Activities in Maputo
 Duration of the Project: 4 years
 Target Group: Municipal Council of Maputo (CMM) and people living in Maputo City
 Target Area: Maputo City (excluding Kalambe and Kanyaka)

Version 4.0
 Date: 10 June 2015

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal The urban environmental and living condition in Maputo City is improved.	1) Amount of inadequate waste Management ("1") is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.	1) 2) Annual monitoring report of DMSC/CMM, 3) 4) 5) Annual Social Survey of CMM -> Clear contents of the report shall be discussed during the project.	
Project Purpose Capacity for Solid Waste Management (SWM) in CMM is improved.	1) The MIP for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the MIP for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period. 4) Guidelines of SWM for Maputo city are approved by CMM.	1) 4) Minutes of Municipal Council (Approval of MIP) 2) Capacity Assessment sheet 3) Project Report	• The current policies and laws for SWM in Maputo City will not change drastically. • The CMM will secure the enough budget to continue the activities proposed in the Project.
Outputs 1. Capacity to analyze the current status of SWM in CMM is improved.	1) CMM understands progress and differences of the current MIP. 2) CMM understands current status about SWM.	1) Updated MIP 2) Reports of Social survey, waste quantity & composition survey, time & motion survey, current situation survey	The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. Stakeholders will not oppose to the implementation of each Pilot Projects.
2. Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairro where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.	1) Project report / annual monitoring report of DMSC 2) Project report / annual monitoring report of DMSC (to measure the number of Bairro to implement recyclable collection). 3) Project report / annual monitoring report of DMSC	
3. Capacity for financial management of SWM in CMM is improved.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported. 3) Annual budget execution rate reaches to 100% ± 15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	1) Financial operation guideline 2) Annual financial report 3) Annual budget planning report 4) Sustainable financial management strategy for SWM sector (to be described in the updated MIP)	
4. 3R activities for reduction of solid waste (including private sector) is introduced in project target area.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary school participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at least 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2 times/year.	1) 2) 3) 4) 5) 6) Project Report / Annual Report of CMM	

Activities	Input	
<p>1-1 Review the existing MP and identify differences compared to actual situation.</p> <p>1-2 Collect and review latest information and data of waste quantity and composition and final disposal volume.</p> <p>1-3 Update the existing MP.</p> <p>1-4 Develop an Action Plan for the project period based on the updated MP.</p> <p>1-5 Develop a guideline of SWM for Maputo City.</p> <p>1-6 Set a target of SWM for post-implementation of the Project and develop a draft of MP.</p> <p>1-7 Develop the Action Plan toward 2021.</p>	<p>1. Japanese Side</p> <p>(a) Dispatch of Experts</p> <ul style="list-style-type: none"> - Chief Advisor / Solid Waste Management - Solid Waste Collection and Transportation - 3R Planning - Environmental Public Awareness Raising / Capacity Development - Financial Management Development <p>(b) Vehicle</p> <p>(c) Equipment and Materials necessary for the Pilot Projects and Public Awareness Raising</p> <p>(d) Counterpart Training in Japan (2-3 counterpart personnel (C/Ps) x twice)</p> <p>2. Mozambican Side</p> <p>(a) Assign of Counterpart Personnel (C/Ps)</p> <p>(b) Facilities and Equipment Necessary for the Project Implementation</p> <p>(c) Office Space for the Japanese Experts</p> <p>(d) Necessary Expenses for the Activities</p> <ul style="list-style-type: none"> - Salaries and Other Allowance for Government Officials - Expenses for Utility such as Electricity, Water Supply, and Gas Fuel - Operational Expenses for Customs Clearance, Storage and Domestic Transportation 	
<p>2-1. Review the situation of waste collection and transportation in Maputo City.</p> <p>2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area.</p> <p>2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3.</p> <p>2-5. Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned.</p> <p>2-6. Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5.</p> <p>2-7. Review and feedback the result of the Pilot Project conducted in Activity 2-6.</p> <p>2-8. Develop the Action Plan for improvement of waste collection and transportation.</p>		
<p>3-1. Review and analyze the current financial management of SWM to identify problems.</p> <p>3-2. Collect periodical data on tax-and-spend of wastes every month.</p> <p>3-3. Enter the data and calculate annual budget and monthly expense.</p> <p>3-4. Develop annual financial report.</p> <p>3-5. Develop annual budget planning.</p> <p>3-6. Review the waste service fee.</p> <p>3-7. Develop the Action Plan for improvement of the financial management.</p>		
<p>4-1. Review the current status of recycling activities for recyclable materials (waste papers, glass, metals, and plastics) and organic wastes.</p> <p>4-2. Study possibility for recycling of materials (including cooperation with waste pickers).</p> <p>4-3. Review and improve public awareness raising programs for 3R introduction.</p> <p>4-4. Implement improved programs for 3R introduction.</p> <p>4-5. Develop a plan for a Pilot Project for promotion of recycling activities (cooperation with private sector) based on the results of Activity 4-2.</p> <p>4-6. Implement a Pilot Project for expansion of the recycling activities (cooperation with private sector) based on the result of Activity 4-2.</p> <p>4-7. Review the result of the Pilot Project in Activity 4-6, and develop a plan for promotion of the Pilot Project.</p> <p>4-8. Develop a plan for a Pilot Project for the utilization of organic waste.</p> <p>4-9. Implement the Pilot Project for the utilization of organic waste.</p> <p>4-10. Review the result of the Pilot Project in Activity 4-9, and develop a plan for promotion of organic waste utilization.</p> <p>4-11. Develop the Action Plan for expansion of the Pilot Project for valuable recycling and organic waste utilization.</p>		<p>Pre-Conditions</p> <p>The GMM will secure the enough budget to implement the Project.</p>

*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or unsanitary final disposal.

Annex 3: Record of Expert Assignment

(As of 29 February 2016)

Position		Name	1st year (MM*)	2nd year (MM*)	3rd and 4th years (MM*)	Total (MM*)
Field Work	Chief Advisor / Solid Waste Management	Mr. Shungo Soeda	5.03	4.40	3.70	13.13
	Deputy Chief Advisor / Solid Waste Collection and Transportation	Mr. Takahiro Kamishita	4.50	3.27	4.23	12.00
	3R Planning	Mr. Kenji Igarashi	4.07	4.00	3.97	12.04
	Civic Education / Social Survey	Ms. Akiko Abe	4.30			4.30
		Mr. Choshin Haneji		2.57	3.43	7.00
	Financial Management Development	Ms. Grace Marco Neptuno	4.53	3.57	3.40	11.50
	Impact Evaluation / Promotion of Source Separation	Mr. Tomoyuki Hosono	2.53	4.00	1.00	7.53
	Project Coordinator / Assistant for 3R Planning and Impact Evaluation / Third Country Training	Mr. Ryu Koide	0.50	1.40	4.40	6.30
	Total of Field		25.46	23.21	24.13	72.80
Home Work	Chief Advisor / Solid Waste Management	Mr. Shungo Soeda	0.37	0.15		0.52
	Deputy Chief Advisor / Solid Waste Collection and Transportation	Mr. Takahiro Kamishita	0.13	0.30		0.43
	Impact Evaluation / Promotion of Source Separation	Mr. Tomoyuki Hosono	0.20		0.50	0.70
	Training in Japan	Mr. Keita Saito	0.43			0.43
	Total of Home		1.13	0.45	0.50	2.08
Total			26.59	23.66	24.63	74.88

*MM stands for man-month

Annex 4: List of Equipment Provided by the Japanese Side

No.	Name	Model	Manufacturer	Qty.	Location	Status
1	Car	Hardbody 2.5 Double Cab 4WD	NISSAN	1	DMSC	In use
2	Car	Urban 2.5 TDi 15 Seats 4x2	NISSAN	1	DMSC	In use
3	Desktop PC	HP 600B MT G640, HP W1972a, UPS 650VA Meissner, Microsoft Office, Anti-Virus Kaspersky	Hewlett-Packard	2	DMSC	In use
4	Laptop PC	HP Probook 4540s, Microsoft Office, Anti-Virus Kaspersky	Hewlett-Packard	2	DMSC	In use
5	Laptop PC	HP Sleekbook G4-14b001e, Microsoft Office, Anti-Virus Kaspersky	Hewlett-Packard	1	DMSC	In use
6	Laptop PC	HP 1000 Laptop	Hewlett-Packard	1	DMSC	In use
7	Laptop PC	Acer Aspire 15.6	Acer	1	DMSC	In use
8	Printer	Canon C2020L	Canon	1	DMSC	In use
9	Container	20 GP Container	-	1	Zimpeto Bairro	stored awaiting for reopen of 3R station

Annex 5: List of Pilot Projects

Subjects	Venues
Waste collection and transportation in urban area	Urban Area
Segregation of recyclables in suburban area	Chamanculo D Bairro
3R station	Zimpeto Bairro
Utilization of organic waste	Mahotas Bairro and Costa do Sol Bairro

Annex 6: List of Counterpart Members

(As of July 2016)

	Name	Task (in the project)	Output	When they joined the project
Management	Florentino Ferreira	City Councilor		
	Joao Mucavele	Director		
	Domingos Chivambo	Deputy Director		
Department of Planning and Monitoring [DPM]	Adelina Mocubela	Finance Proof of Service	Output 3	2013 2016
	Ibraimo Caroga	Proof of Service	Output 3	2013
	Alfredo Leitaio	Civic Education	Output 4	2014
	Nhantumbo	3R Activities	Output 4	2013
	Euridia Isabel	Civic Education	Output 4	2016
	Antonio Chauque	Supervision	Output 2 Output 4	2014
	Elsa Manhique	Supervision – Urban Area Reports using QGIS	Output 2 Output 4	2015
	Rute Massingue	Civic Education Supervision	Output 4 Output 4	2014 2016
	Anselmo Inguane	3R Activities	Output 2 Output 4	2013
	Fidel Henriques	Assistant	Output 2 Output 4	2016
	Florência Martins	3R Activities	Output 4	2013
	Hortência Nhamahango	3R Activities Assistant	Output 4	2015
	Luisa Langa Bila	Head of Coordinator/Master Plan Department	Output 1	2013
	Sergio Manhique	Master Plan	Output 1 Output 4	2013
	Simão Mutereda	3R Activities	Output 2 Output 4	2014
DAF	Rosa Paula	Finance	Output 3	2013
	Leonardo Almanjane	Finance	Output 3	2016
DGRSU	Meriamo Stela	Head of SWM – Treatment and Disposal of USW Department	Output 2 Output 4	2013
	Zefanias Langa	SWM – Collection and Transportation of USW	Output 2	2015

DAF: Department of Administration and Finance

DGRSU: Department of Management of Urban Solid Waste

Annex 7: List of Participants of Trainings

(1) Training in Japan (13 - 26 October 2013)

Main topics: "M/P, and legislation", "collection and transportation", "financial and institutional management" and "3R and civic education"

Name of Counterpart	Position/Department	Related Output
Mr. Florentino Abilio Geraldês Ferreira	City Councilor of Solid Waste Management and Cemeteries	Project Director
Mr. Joao Agostinho Mucavele	Director, Municipal Directory of Urban Solid Waste Management	Project Manager 1, (2, 3, 4)
Mr. Sergio Manhique	Head of Distribution Monitoring & Quality Control	1, 3
Mr. Martins Mandlate	Head of Department of Urban Solid Waste Management	2, (1)
Mr. Anselmo Salvador Inguane	Manager of Secondary Collection Contracts	2
Ms. Euridia Isabel Cesar Sithoy	Coordinator Collect primary activities in the suburban area	2, 4
Ms. Florencia Francisco Martins	Coordinator of Civic Education Activities and Secondary Collection	2, 4
Ms. Rosa Paulo Chissico	RAF income management	3

(2) Training in Brazil (27 September - 10 October 2015)

Main topics: "M/P, and legislation", "collection and transportation", "financial and institutional management", "3R and civic education" and "final disposal site and waste pickers"

Name of Counterpart	Position/Department	Related Output
Mr. Florentino Abilio Geraldês Ferreira	City Councilor of Solid Waste Management	Project Director
Mr. Joao Agostinho Mucavele	Director, Municipal Directory of Urban Solid Waste Management	Project Manager 1, (2, 3, 4)
Ms. Luisa Bila	Head of Department of Planning and Monitoring	Project Coordinator 1
Mr. Sergio Manhique	Head of Monitoring and Quality Control Section	1, 3
Ms. Meriamo Stela Novela	Head of Department of Management of Urban Solid Waste	2, 4
Ms. Rute Massingue	Department of Planning and Monitoring	4
Mr. Tonyningos Muioi	Department of Administration and Finance	3
Mr. Anselmo Salvador Inguane	Manager of Secondary Collection Contracts	2, 4

Annex 8: List of Joint Coordination Committee (JCC) Meetings

No.	Venue	Date	Issues discussed / agreed
1st JCC	DMSC	1 Apr. 2013	- Work Plan of the Project
2nd JCC	DMSC	31 Jul. 2013	- Preliminary Review Result of Current Situations in the M/P 2007 - Preliminary Result of Capacity Survey - Review of Indicators of PDM - Draft Capacity Development Plan - Future Activity Schedule
3rd JCC	DMSC	9 Jun. 2014	- Report of Progress of the 1st Year Activities - Introduction of Action Plan during the Project Period - Proposal for Modification of PDM - Explanation of Work Plan of 2nd Year Activity
4th JCC	DMSC	27 Nov. 2014	- Mid-term review and agreement on recommendation by the review team
5th JCC	DMSC	10 Jun. 2015	- Sharing the Work Plan (1) for the 3rd and 4th years - Revision of PDM
6th JCC	DMSC	9 Jun. 2016	- Approval of the Work Plan (2) for the 3rd and 4th years to finalize the activities
7th JCC	Multi Convention Center	19 Aug. 2016	- Terminal Evaluation and agreement on recommendation by the evaluation team
8th JCC (planned)		Jan. 2017 (planned)	- Reporting the final progress

Annex 9: History of revision of PDM

	PDM 1.0 (17 Jul 2012)	PDM 2.0 (27 Jun 2014)	PDM 3.0 (27 Nov 2014)	PDM 4.0 (10 Jun 2015)
Overall Goal	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.	The urban environmental and living condition in Maputo City is improved.
Objectively Verifiable Indicators of the overall Goal	1) Amount of inadequate waste disposal is decreased. 2) Amount of final waste disposal per person is decreased.	1) Amount of inadequate waste disposal is decreased. 2) Amount of final waste disposal per person is decreased.	1) Amount of inadequate waste disposal (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2017 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.	1) Amount of inadequate waste Management (*1) is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.
			*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.	*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.
Important Assumptions for the Overall Goal	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.	1. The current policies and laws for SWM in Maputo City will not change drastically. - The CMM will secure the enough budget to continue the activities proposed in the Project.
Project Purpose	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.	Capacity for Solid Waste Management (SWM) in CMM is improved.
Objectively Verifiable Indicators of the Project Purpose	1) The M/P for post-termination of the Project is approved by CMM. 1) XX (number) components of 3R system are proposed in Maputo City. 2) A guideline of SWM for Maputo city, a draft of M/P for post-termination of the Project, the Action Plan toward 2021 are developed.	1) The M/P for post-termination of the Project is approved by CMM. - XX (number) components of 3R system are proposed in Maputo City. - A guideline of SWM for Maputo City, a draft of M/P for post-termination of the Project, the Action Plan toward 2021 are developed.	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Results of capacity assessment achieve at X point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for	1) The M/P for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the M/P for

			post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period. 4) Guidelines of SWM for Maputo city are approved by CMM.	post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period. 4) Guidelines of SWM for Maputo city are approved by CMM.
Important Assumptions for the Project Purpose	<ul style="list-style-type: none"> - The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects. 	<ul style="list-style-type: none"> - The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects. 	<ul style="list-style-type: none"> - The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects. 	<ul style="list-style-type: none"> - The Mozambican counter personnel of the Project will not change their position dramatically during the Project term. - Stakeholders will not oppose to the implementation of each Pilot Projects.
Output 1	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.	Capacity to analyze the current status of SWM in CMM is improved.
Objectively Verifiable Indicators of Output 1	<ol style="list-style-type: none"> 1) CMM understands progress and differences of the current M/P. 2) CMM understands public perception about SWM. 	<ol style="list-style-type: none"> 1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM. 	<ol style="list-style-type: none"> 1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM. 	<ol style="list-style-type: none"> 1) CMM understands progress and differences of the current M/P. 2) CMM understands current status about SWM.
Output 2	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.
Objectively Verifiable Indicators of Output 2	<ol style="list-style-type: none"> 1) Amount of collection and transportation of solid waste is increased by XX%. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to XX (number). 3) Rate of broken container is decreased by XX%. 4) Number of container adequately allocated is increased to XX (number). 	<ol style="list-style-type: none"> 2) Amount of collection and transportation of solid waste is increased by XX%. 3) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to XX (number). 4) Rate of broken container is decreased by XX%. 5) Number of container adequately allocated is increased to XX (number). 	<ol style="list-style-type: none"> 1) Amount of collection and transportation of solid waste is accurately monitored by CMM and missing data or discrepancy with data reported by the large-scale contractors is less than X% of the total amount. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Number of instructions to large-scale contractors is more than X times. 4) Number of claims regarding waste collection from the residents in Maputo city decreases 20%. 	<ol style="list-style-type: none"> 1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.
Output 3	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.	Capacity for financial management of SWM in CMM is improved.
Objectively Verifiable Indicators	1) Expenditure for SWM in Maputo	2) Financial operation procedure is	1) Financial operation procedure is	1) Financial operation procedure is

of Output 3	City is monitored and a budget planning is developed.	shared with official document. 3) Revenue baseline data is regularly collected and reported. 4) Budget is planned by considering the variance between budget execution and budget plan of the previous year.	shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported. 3) Annual budget execution rate reaches to 100%±15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported. 3) Annual budget execution rate reaches to 100%±15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.
Output 4	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.	3R activities for reduction of solid waste (including private sector) is introduced in project target area.
Objectively Verifiable Indicators of Output 4	1) Educational material about 3R is developed. 2) CMM is capable of running public awareness activities routinely. 3) Amount of material recovery in the Pilot Project area is increased by XX%. 4) Amount of compost in the Pilot Project area is increased by XX%.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) Amount of material recovery in the Pilot Project area is increased by XX%. 4) Amount of compost in the Pilot Project area is increased by XX%.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) X (number) schools conduct civic education related 3R. 4) Participation rate of households who conduct segregation of recyclables in the PP area is doubled. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Number of participants from private sector is increased to XX (number).	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary schools participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. - Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2times/year.
Pre-conditions	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.	- The CMM will secure the enough budget to implement the Project.

Project Design Matrix (PDM)

Project Title: The Project for Promotion of Sustainable 3R Activities in Maputo
 Duration of the Project: 4 years
 Target Group: Municipal Council of Maputo (CMM) and people living in Maputo City
 Target Area: Maputo City (excluding Kalembe and Inhaca)

Version 5.0

Date: 19 August 2016

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal The urban environmental and living condition in Maputo City is improved.	1) The number of reports on inadequate waste management ("1") is decreased. 2) Amount of final waste disposal per person is decreased. 3) Amount of collected recyclables is increased. 4) Rate of residents who understand the definition of 3R and engage 3R activities increases from X% in 2016 to X% in 2020. 5) Satisfaction of citizen for solid waste management is increased.	1), 2) Annual monitoring report of DMSC/CMM, 3), 4), 5) Annual Social Survey of CMM → Clear contents of the report shall be discussed during the project.	
Project Purpose Capacity for Solid Waste Management (SWM) in CMM is improved.	1) The MIP for post-termination of the Project including plans to promote sustainable 3R activities is approved by CMM. 2) Average score of capacity assessment achieve at least 3 point of 5 scale evaluation. 3) Workshops to share and examine drafts of the Guideline, the Action plan, and the MIP for post-termination of the Project, are held among related authorities and stakeholders at least 2 times during the Project period. 4) Guidelines of SWM for Maputo city are approved by CMM.	1) 4) Minutes of Municipal Council (Approval of MIP) 2) Capacity Assessment sheet 3) Project Report	• The current policies and laws for SWM in Maputo City will not change drastically. • The CMM will secure the enough budget to continue the activities proposed in the Project.
Outputs 1. Capacity to analyze the current status of SWM in CMM is improved.	1) CMM understands progress and differences of the current MIP. 2) CMM understands current status about SWM.	1) Updated MIP 2) Reports of Social survey, waste quantity & composition survey, time & motion survey, current situation survey	The Mozambican counter personnel of the Project will not change their position drastically during the Project term. Stakeholders will not oppose to the implementation of each Pilot Projects.
2. Capacity to collect and transport of SWM in project target area (cooperation with private sector) is improved.	1) Number of critical points of waste collection and illegal dumping is reduced by 20% by PP activities of urban area. 2) Number of Bairros where recyclable collection of solid waste is continually implemented is increased to at least 1. 3) Problem reports regarding waste collection from the residents and contractors in Maputo city.	1) Project report/ annual monitoring report of DMSC 2) Project report/ annual monitoring report of DMSC (to measure the number of Bairros to implement recyclable collection). 3) Project report/ annual monitoring report of DMSC	
3. Capacity for financial management of SWM in CMM is improved.	1) Financial operation procedure is shared with official document. 2) Basic Revenue and Cost data is regularly collected and reported. 3) Annual budget execution rate reaches to 100% ± 15% in 2015 and 2016. 4) Sustainable financial management strategy for SWM sector is developed.	1) Financial operation guideline 2) Annual financial report 3) Annual budget planning report 4) Sustainable financial management strategy for SWM sector (to be described in the updated MIP)	
4. 3R activities for reduction of solid waste (including private sector) is introduced in project target area.	1) Educational material about 3R is developed. 2) New office for civic education is established in DMGRSUS. 3) 31 primary school participate in civic education program related 3R through the most creative school contest or other occasions. 4) Average quantity of recyclables collected per month through PP reaches at least 200kg. 5) 50% of households who participated the PP for utilization of organic waste continues the activity. 6) Workshops for 3R promotion in Maputo City inviting concerning private institutions and NGOs are held regularly at least 2 times/year.	1), 2), 3), 4), 5), 6) Project Report/ Annual Report of CMM	

Activities	Inputs	
1-1 Review the existing MIP and identify differences compared to actual situation. 1-2 Collect and review latest information and data of waste quantity and composition and final disposal volume. 1-3 Update the existing MIP. 1-4 Develop an Action Plan for the project period based on the updated MIP. 1-5 Develop a guideline of SWM for Maputo City. 1-6 Set a target of SWM for post-termination of the Project and develop a draft of MIP. 1-7 Develop the Action Plan toward 2021.	1. Japanese Side (a) Dispatch of Experts - Chief Advisor / Solid Waste Management - Solid Waste Collection and Transportation - 3R Planning - Environmental Public Awareness Raising / Capacity Development - Financial Management Development (b) Vehicle (c) Equipment and Materials necessary for the Pilot Projects and Public Awareness Raising (d) Counterpart Training in Japan (2-3 counterpart personnel (C/Ps) x 1Wce)	
2-1. Review the situation of waste collection and transportation in Maputo City. 2-2. Develop a plan for a Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area. 2-3. Implement the Pilot Project for improvement of waste collection and transportation in cooperation with private sector in urban area. 2-4. Review and feedback the result of the Pilot Project conducted in Activity 2-3. 2-5. Based on the result of Activity 2-1, a plan for a Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs is planned. 2-6. Implement the Pilot Project for introduction of recyclable collection at the primary collection of solid waste in suburbs planned in Activity 2-5. 2-7. Review and feedback the result of the Pilot Project conducted in Activity 2-6. 2-8. Develop the Action Plan for improvement of waste collection and transportation.	2. Mozambican Side (a) Assign of Counterpart Personnel (C/Ps) (b) Facilities and Equipment Necessary for the Project Implementation (c) Office Space for the Japanese Experts (d) Necessary Expenses for the Activities - Salaries and Other Allowance for Government Officials - Expenses for Utility such as Electricity, Water Supply, and Gas Fuel - Operational Expenses for Customs Clearance, Storage and Domestic Transportation	
3-1. Review and analyze the current financial management of SWM to identify problems. 3-2. Collect periodical data on tax-and-spend of wastes every month. 3-3. Enter the data and calculate annual budget and monthly expense. 3-4. Develop annual financial report. 3-5. Develop annual budget planning. 3-6. Review the waste service fee. 3-7. Develop the Action Plan for improvement of the financial management.		
4-1. Review the current status of recycling activities for recyclable materials (waste papers, glass, metals, and plastics) and organic wastes. 4-2. Study possibility for recycling of materials (including cooperation with waste pickers). 4-3. Review and improve public awareness raising programs for 3R introduction. 4-4. Implement improved programs for 3R introduction. 4-5. Develop a plan for a Pilot Project for promotion of recycling activities (cooperation with private sector) based on the results of Activity 4-2. 4-6. Implement a Pilot Project for expansion of the recycling activities (cooperation with private sector) based on the result of Activity 4-2. 4-7. Review the result of the Pilot Project in Activity 4-6, and develop a plan for promotion of the Pilot Project. 4-8. Develop a plan for a Pilot Project for the utilization of organic waste. 4-9. Implement the Pilot Project for the utilization of organic waste. 4-10. Review the result of the Pilot Project in Activity 4-9, and develop a plan for promotion of organic waste utilization. 4-11. Develop the Action Plan for expansion of the Pilot Project for valuable recycling and organic waste utilization.		<div style="border: 1px solid black; padding: 5px;"> <p>Pre-Conditions</p> <p>The ChM will secure the enough budget to implement the Project</p> </div>

*1 "Inadequate waste management" signifies inadequate management of containers, negligence of regular collection, illegal dumping or insanitary final disposal.

The Project for Promotion of Sustainable 3R Activities in Maputo
Japan International Cooperation Agency - Technical Cooperation Project



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Agenda for 7th Joint Coordination Committee Meeting

Purpose:

- To review and discuss the progress of the project
- To share the result of the Terminal Evaluation
- To discuss the future plans and activities

Date and Time	19th August (Fri.), 9:00A.M. to 11:45A.M
Venue	CMM Training Center
Chair	Florentino Ferreira (CMM City Councilor, Project Director)
M/C	Anselmo Inguane (Monitoring and Quality Control Section: DMSC)

Agenda

8:30- 9:00	Registration by DMSC/JET and music/Mr. Leitão
9:00- 9:10	Introduction of Participants
9:10- 9:20	Opening Remarks: CMM/Florentino Ferreira (City Councilor, Project Director) JICA Mozambique/Katsuyoshi SUDO (Chief Representative)
9:20- 10:10	Reporting Result of Terminal Evaluation (Joint Evaluation team) - Achievement of the project activities (Mr. Joao Cipriano and Mr. Agostinho Fernando) - Evaluation by 5 Criteria (Mr. Makoto Tanaka) - Results and Recommendations (Mr. Takaaki Murata)
10:10-10:30	Questions and Answers
10:30-10:40	Display of Photos accompanied by Music/ Mr. Leitão
10:40-11:15	Wrap-up Discussion and Confirmation - Wrap up comments for the project activities/ Shungo Soeda (JET Chief Advisor) and Joao Mucavele (Project Manager) - Wrap up Comment/ Daisuke Iijima (Mission Leader)
11:15-11:25	Closing Remark CMM/Florentino Ferreira (City Councilor, Project Director)
11:25-11:30	Signing of Minutes of meeting
11:30	Coffee and Tea

- END-

**MINUTES OF THE MEETING
OF THE 8TH JOINT COORDINATION COMMITTEE
FOR THE
PROJECT FOR THE PROMOTION OF SUSTAINABLE 3R ACTIVITIES
IN MAPUTO
REPUBLIC OF MOZAMBIQUE**

The 8th Meeting of the Joint Coordination Committee (hereinafter referred as “JCC”) was held on March 23rd, 2017, in the Training Center of Maputo Municipal Council (hereinafter referred to as “SFCMM”). The participants in the meeting were the City Councilor for Waste Management and Cemeteries, in the capacity of chairperson of the Committee, JICA Office Resident Representative in Mozambique, MITADER representatives, and representatives from different institutions such as NGOs, private companies of waste collection, Microenterprises, as well as relevant staff from DMSC and JICA expert team members (hereinafter referred to as “JET”).

The objective of the 8th JCC meeting was to report on the activities conducted throughout the four years of the Project for the Promotion of Sustainable 3R Activities in Maputo (hereinafter referred to as “the Project”). As for the second objective, the proposal of the new Master Plan (hereinafter referred to as “M/P”) on Solid Waste Management for Maputo City was presented.

As a result of the 8th JCC meeting, both the Mozambican side as well as the JICA expert team side confirmed the progress and the completion of the Project and the City Councilor thanked for the knowledge transferred to the Mozambican technicians and ensured that they would carry out with the knowledge acquired.

Maputo, on April 24, 2017



Mr. Florentino Ferreira
Chairperson of Joint Coordination
Committee,
City Councilor for Waste Management
Municipal Council of Maputo



Mr. Shungo SOEDA
Chief Advisor
JICA Expert Team

ATTACHED DOCUMENT

1. Opening Remarks

At the beginning of the JCC meeting, the JCC chairperson, Mr. Florentino Ferreira, Councilor for Waste Management and Cemeteries, delivered his opening remarks and addressed his acknowledgement to the Japanese Government and, especially, to the Japanese people for the technical support. Afterwards, he described the steps taken by the Project, which started in 2013, and ended with this last JCC.

The Project aimed at promoting 3R and reviewing the Master Plan issued in 2007.

When finalizing, he thanked, once again, the Japanese Government for having selected Maputo to host the International Seminar planned to be held weeks after the JCC.

After the remarks from the JCC chairperson, Mr. Hidetake Aoki, the deputy resident representative of JICA Mozambique Office, started by greeting all the participants and, in general terms, described the contours of the cooperation that was the result of the bilateral agreement between the government of Mozambique and Japan, with a duration of four (4) years and which will culminate with the elaboration of the Master Plan.

He pointed out that the project is focused on the collection, transportation of solid waste and composting of organic waste.

He called on the Municipality to disseminate the best practices of USWM such as the 3R on TVs.

He also mentioned the International Seminar to be held in Maputo City in April together with the preparatory meeting for African Clean Cities Platform.

2. Report on the progress of the Project and the new M/P

The JCC had a total of eight (8) presentation focused on the outputs reached over the four years of the Project and the Master Plan.

- Ms. Luísa made a summary of the Project and introduced the members of the Project, the schedule and the main activities developed over the 4 years;
- Mr. Anselmo made a presentation on the contents of the new Master plan;
- Ms. Stela made a presentation on the new Master Plan, on the component pertaining waste collection and transportation;



- Mr. Langa made a presentation regarding the waste treatment and disposal process;
- Ms. Florencia made a presentation on the 3R introduction plan;
- Ms. Eurídia focused her presentation on the implementation of the Civic Education Plan and Environmental Promotion with the aim of promoting good environmental management practices;
- Ms. Adelina presented the Financial Management Plan where she focussed on the revenues collected through the charging of fees;
- Mr. Sérgio made a presentation on the monitoring plan and the action plan of the new M/P, with focus on the pentagon approach;
- Mr. Soeda made a presentation focusing on the course taken by Project and the different trainings attended by the DMSC staff in Japan and Brazil and in other parts of the world. At last, there was a presentation on common issues for all outcomes.
- Director Mucavele made a presentation on ANGER (Solid Waste Management Association) which was proposed to establish in near future in the middle of 2016, with the objective of promoting and developing sustainable SWM practices in a professional manner. This will be a non-profitable association and the documentation for its establishment have already been submitted to the Ministry of Justice.

3. Discussion

In the discussion session, the first intervention was by Mr. **José Machado** who congratulated the work and stated that he had never got any information about the activities, especially the one implemented by JICA in coordination with the Municipality. But he advised the directorate to create a web page in order to disseminate this kind of work.

- Mr. **Hafido Abacassamo** from the CMM raised a query related to the Master Plan, pointing out that this is a guiding document on waste management for the next ten (10) years and that it was giving too much focus on the 3R model. In his opinion, the Municipality of Maputo is still not prepared to receive this model due to the lack of appropriate facilities, i.e. transportation, storage, separation etc.
- The Director of Finance from the CMM, **Mr. Ananias Couane** started his intervention by congratulating the project. He acknowledged the results achieved with regards to the human resources, but he also mentioned the need to specify the source when it comes to data analysis.

He advised that the Civic Education Plans, as well as the monitoring plans, should

include the financial component so as to know how much it will cost.

As for the revenues, he wanted to know whether the improvements observed on revenue collection were an outcome of the project or the result of the IT system that was installed at PdS.

In the end, he showed the need to demonstrate the real amount to be paid by the municipality in order for the municipality to bear the SWM costs, highlighting that there should be an action plan that can show the gradual increase of the cleaning taxes so that, for example, by 2020 the citizen can pay the real amount.

He requested the assessment of the project for the use of plastic bag in order to determine if the objectives have been met.

- Mr. **João Cipriano** from MITADER, requested DMSC to share the data of the project. He also mentioned that MITADER is in the process of developing a database related to all environmental management activities with the purpose of disseminating contents at the level of related institutions, such as schools and other municipalities.

The Director of DMSC, Mr. **João Agostinho Mucavele**, replied saying this Plan aims at solving the current and future problems and explained that there were times when the problem was related to scattered waste on the roads, but now we don't have such problem. The master plan contents were prepared deliberately in order to move in line with other countries.

He also quoted the words of the Finance Director (educated people create less problems), and regarding data sharing he mentioned that there wasn't any inconvenience.

In addition, he highlighted the role of **Ms. Ace Neptuno**, an economist of the JET, who contributed a lot for the achievement of the current status of financial management at the Directorate.

As for the issue raised by MITADER representative, the director mentioned that MITADER representative was also part of the project and that data could be made available up on request of specific information taking into account that not everything could be useful for MITADER.

Mr. **Shungo Soeda**, a chief advisor of the JET, explained the content of the project, especially the steps taken for its implementation during the past four (4) years.

The City Councilor, Mr. **Florentino Ferreira** encouraged the continuation with the 3R implementation, arguing that based on it we could be able to reduce the amount of waste

generated including its disposal. He mentioned that CMM is paying very high SWM costs since the termination of PROMAPUTO 2, funded by the World Bank.

He said that one of the constraints with regard to the 3R is the lack of recycling companies in the country.

4. Closing Remarks

The Chairperson of the JCC, Mr. **Florentino Ferreira**, started by making reference to the 4 years of hard work, and pointed out that the work between different people with different cultures was not easy. He thanked for the knowledge transferred to the Mozambican technicians and ensured that DMSC will continue with the teachings left, especially the Progress Meetings.

In the end he thanked the Government of Japan and specially its people.

A handwritten signature in blue ink, consisting of stylized, overlapping loops and strokes, located to the right of the closing remarks text.

Appendix I

LIST OF PARTICIPANTS

CMM

Mr. Florentino Ferreira	Councilor for Waste Management and Cemeteries
Mr. João Agostinho Mucavele	Director of DMSC

MITADER

Mr. Joao Cipriano	Head of the Department of Solid Waste Management
Mr. Celso Tivane	Technician

MATOLA MUNICIPAL COUNCIL

Ms. Célia Carlos Beira	Solid Waste Management Director
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DMSC, CMM

Ms. Adelina Mucubela	Proof of Service
Ms. Domingas P. Romão	Deputy Director, Cemeteries
Ms. Luísa Langa Bila	Department of Planning and Monitoring
Mr. Sérgio Manhique	Department of Planning and Monitoring
Mr. Leonardo Almajane	Department of Administration and Finances
Mr. Simão Pedro Mutterreda	Department of Planning and Monitoring
Mr. Anselmo Inguane	Department of Planning and Monitoring
Ms. Florência Martins	Department of Planning and Monitoring
Ms. Rosa Paula	Department of Administration and Finances
Mr. Agostinho Lição	Department of Workshop and Motor Pool
Mr. Ananias Coane	Directorate of Finances
Ms. Ângela Matsinhe	DMAE
Mr. Zefanias Langa	Department of Solid Waste Management
Mr. António Chaúque	Department of Planning and Monitoring
Ms. Hortência Nhamahango	Department of Planning and Monitoring
Ms. Mário Manjate	Department of Workshop and Motor Pool
Ms. Rute Massingue	Civic Education Office
Mr. Alfred Leitão	Civic Education Office
Ms. Eurídia Isabel	Civic Education Office
Ms. Vânia Mugabe	Civic Education Office



Ms. Constância Bambu	Municipal Directorate of Markets and Fairs
Mr. António Ferreira	Department of Finances
Mr. Almeida Afonso	Proof of Service
Ms. Miriamo Stela	Department of Solid Waste Management
Mr. Háfido Abacassamo	CMM
Ms. Hortência	Department of Planning and Monitoring
Ms. Elsa Manhique	Supervision Section
Ms. Natacha Morais	Director of International Relations
	Department, CMM

NGOs, microenterprises, Associations, etc

Mr. Dionísio Reis	AMOR
Mr. Quelto Janeiro	Dossiers e Factos
Mr. Muanza Duarte	AGREC Lda
Ms. Honana Nhancupe	GP Municipal
Mr. Fernando Victorino	RTP
Sr. Isildo Nhantumbo	ESF
Mr. Abdul	Enviroserv
Mr. José Machado	CIROCAN
Sr José Fernando	ECOLIFE
Ms. Valéria	LVIA
Ms. Isabel Bombe	SEM LIXO
Mr. Oliveira	AMMEPS
Mr. Angelo	SEM LIXO
Mr. Pedro Laice	ANAMM
Mr. Norberto Costa	ECOLIFE
Mr. F. Élio	LVIA
Mr. Hilário	KIM

JICA Expert Team

Mr. Shungo Soeda	Chief Advisor
Ms. Cândida Boavida	Technical Assistant
Mr. Ilénio Mate	Translator/ Interpreter
Mr. Acacio Muhosse	Translator/ Interpreter

JICA Mozambique Office

Mr. Katsuyoshi Sudo	Resident Representative
Mr. Hidetake Aoki	Deputy Resident Representative

Ms. Makiko Inamori
Mr. Stélio Massuque

Project Formulation Advisor
Program Officer

Embassy of Japan

Mr. Yasuma Takao

Researcher/ Analyst

Japan Overseas Cooperation Volunteers (JOCV)

Mr. Yuta Yamazoe

Volunteer for Environmental Education

Mr. Takuya Sano

Volunteer for Environmental Education

Ms Akemi Seki

Volunteer for Environmental Education

