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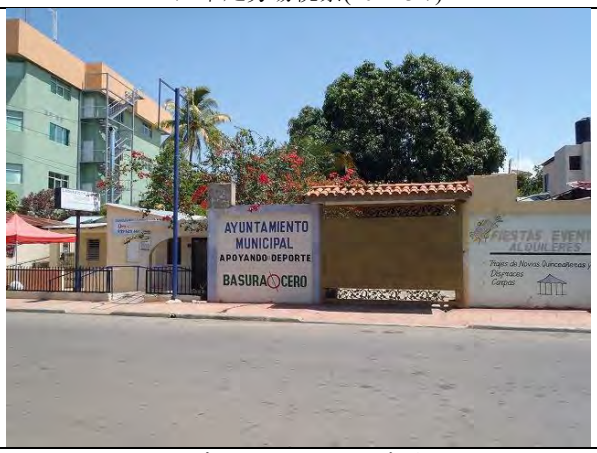	
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	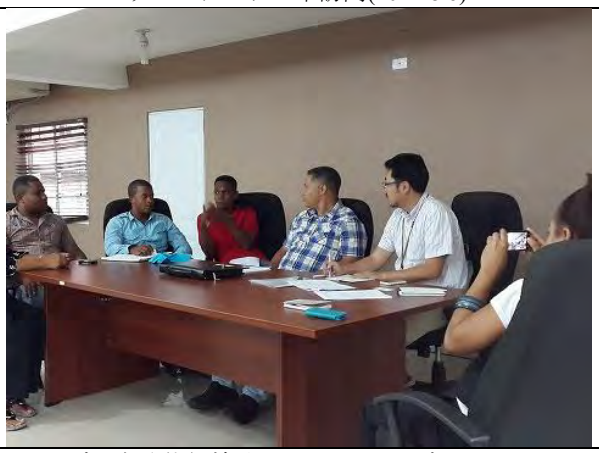
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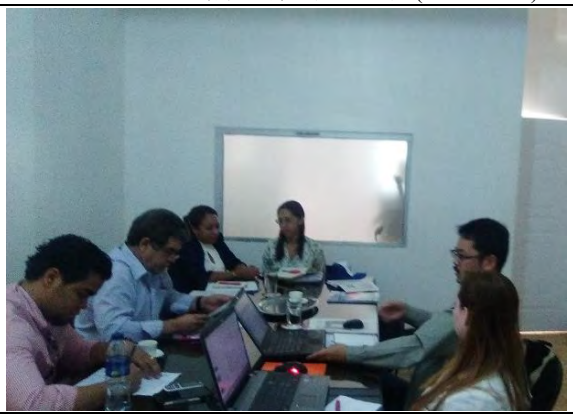	
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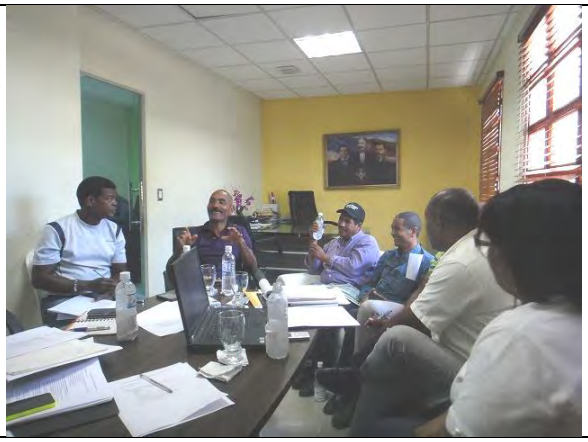

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	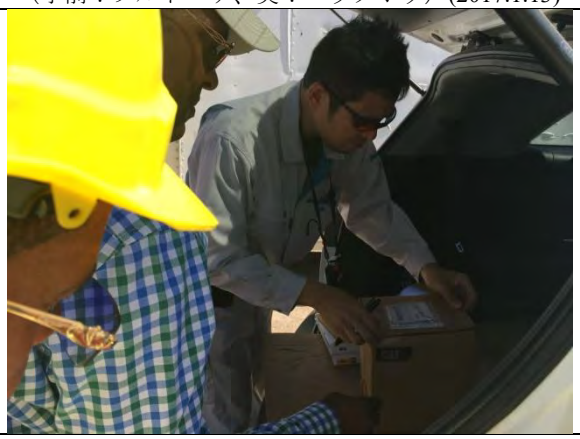
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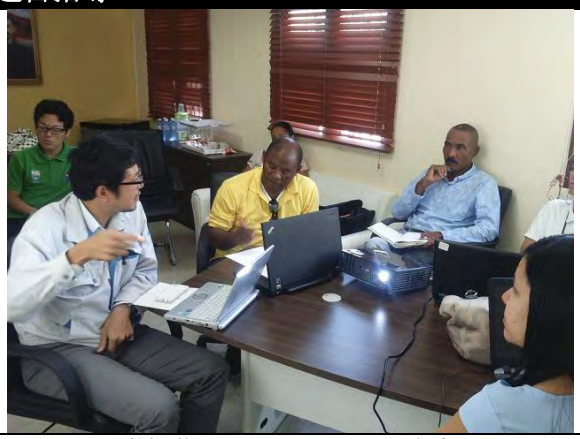

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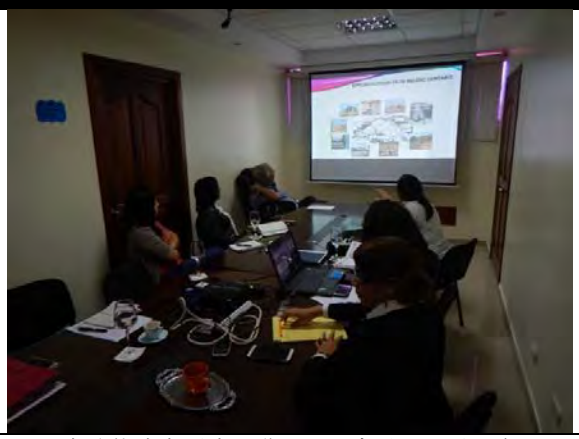

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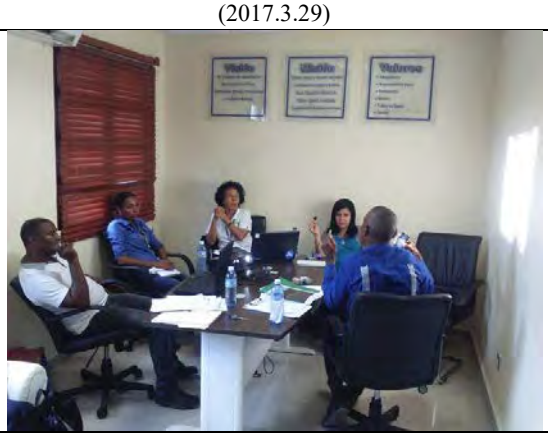

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	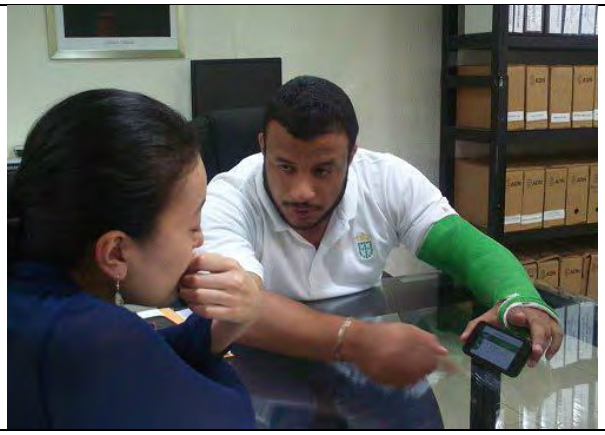
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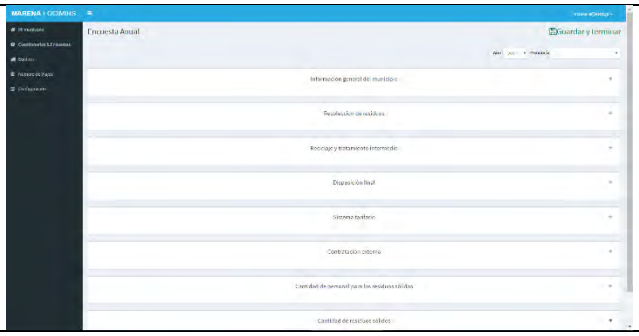
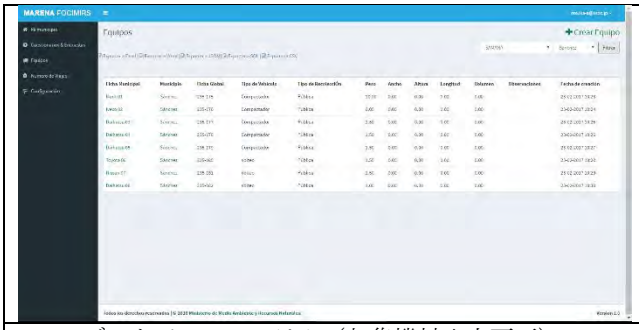
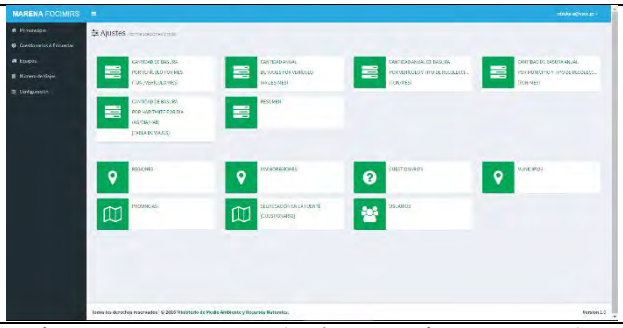


データベースシステム（質問票入力画面）



データベースシステム（収集機材入力画面）



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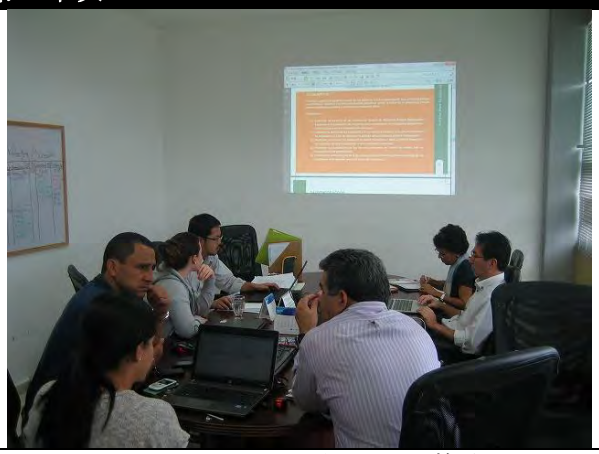

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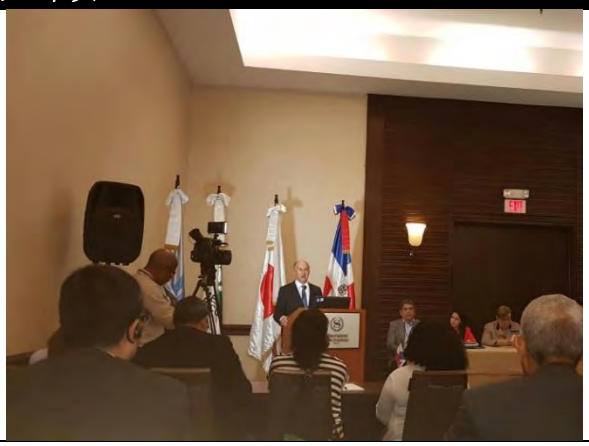

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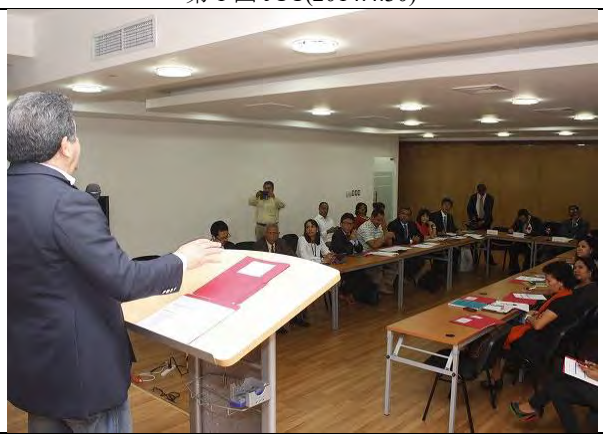

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第 3 回　JCC(2015.8.7)

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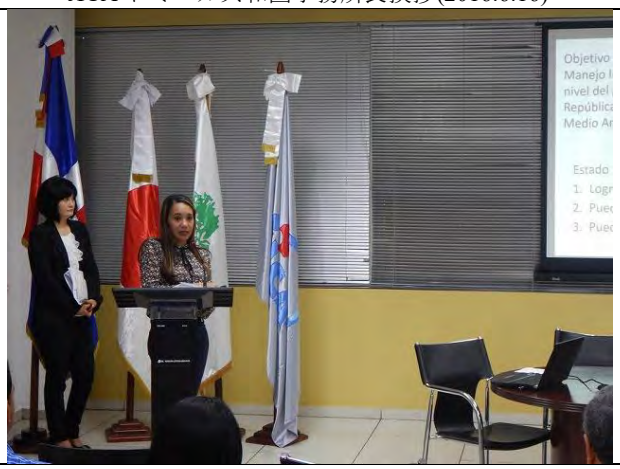	
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第 6 回 JCC （MEPyD 来賓挨拶）(2017.5.25)	第 6 回 JCC（JICA 本部ミッション総評）(2017.5.25)

廃棄物関連法務

廃棄物管理一般法案の第 2 回公聴会へ参加[国会](2015.5.21)

廃棄物一般法に係る第 3 回公聴会（プンタ・カナ）(2015.9.2)

国会の環境コミッションでの廃棄物一般法案説明の傍聴(2016.9.19)

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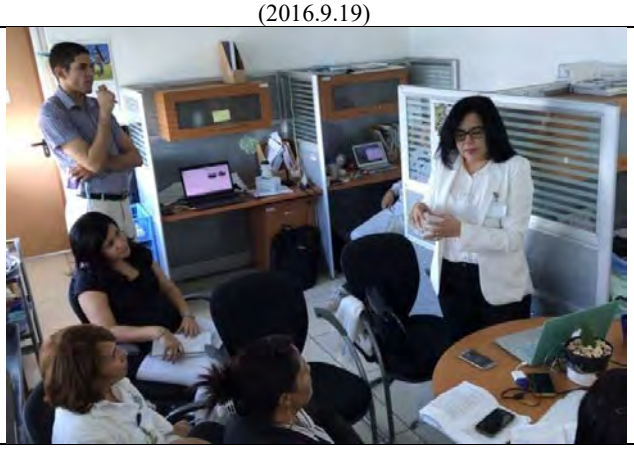

施行令・施行規則案等の C/P への説明(2017.2.13)

施行令・施行規則改訂案に関する協議(2017.4.10)

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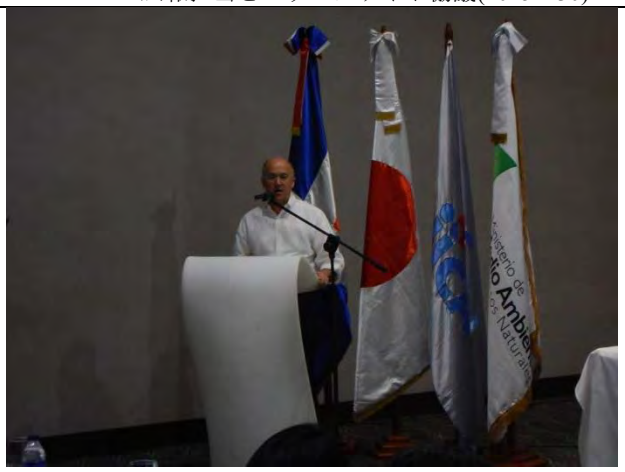	
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終了時セミナー@アスア（MANCOM 代表挨拶）(2017.5.23)	終了時セミナー@アスア（MANCOM より JICA に感謝楯の贈呈）(2017.5.23)

ミーティング

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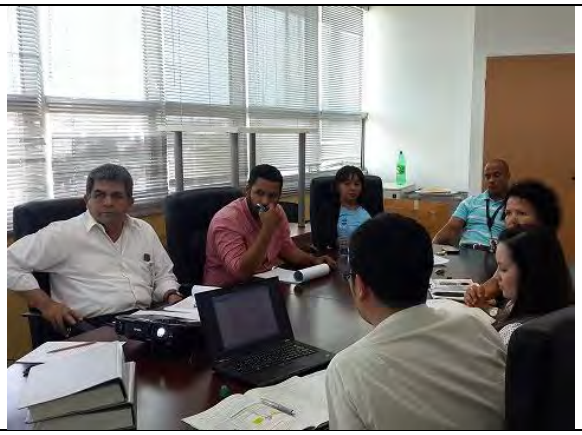

第 2 回 JCC 準備とワーク・プラン（第 2 年次）に関する打合せ(2015.4.28)

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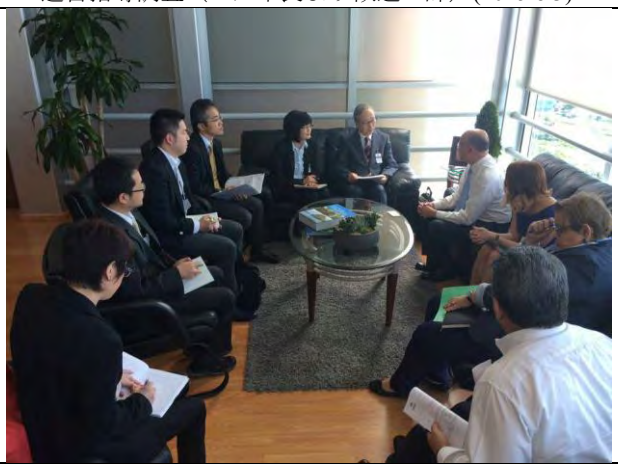
運営指導調査・終了時評価

運営指導調査（キックオフ会議）(2015.7.30)	運営指導調査（アスア市長より歓迎の辞）(2015.7.30)
	
運営指導調査（モカ市長より歓迎の辞）(2015.8.3)	運営指導調査（合同レビューレポート協議）(2015.8.6)
	
MARENA 大臣表敬同行（終了時評価）(2016.9.13)	アスア MANCOM による説明（終了時評価）(2016.9.13)

本邦研修

	
本邦研修 4 日目 （（一財）日本環境衛生センター講義）(2015.10.1)	本邦研修 5 日目 （名古屋市鳴海工場見学）(2015.10.2)
	

本邦研修 5 日目 （名古屋市南リサイクルプラザ）(2015.10.2)	本邦研修 6 日目 （新海面処分場見学）(2015.10.5)
	
本邦研修 7 日目 （新宿リサイクル活動センター実習）(2015.10.6)	本邦研修 8 日目 （（株）アルフォ 飼料化施設見学）(2015.10.7)
	
本邦研修 8 日目（高俊興業（株）建設混合廃棄物リサイクル施設見学）(2015.10.7)	本邦研修 9 日目 （評価会）(2015.10.8)

添付資料９

モデル自治体の ISWM プラン

Moca's Municipal City Hall,
Espaillat Province D.R.

Plan de Manejo Integral de Residuos Sólidos (ISWM)

Moca's Municipality,

Period (2017-2031)

May 2017

ABBREVIATIONS

FOCIMiRS	Project for the Strengthening of Institutional Capacity in Solid Waste Management
JICA	Japan International Cooperation Agency
FDS	Final Disposal Site
GIS	Geographic Information System (Sistema de Información Geográfica)
UGAM	Municipal Environmental Management Unit

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1 Introduction

The treatment of waste in the municipality of Moca has undergone changes in the different administrations. Until the year 2000, the landfill was open pit managed by pouring and burning. From 2000 to 2006, the open-air landfill was converted to a semi-controlled landfill. In 2007, this methodology was abandoned and a new one was chosen for the open landfill until 2010. Since the last quarter of 2010, efforts have focused on returning to the semi-controlled landfill method by compaction and landfill in a natural pit with land cover, although this procedure does not offer the advantages of treatment of leachates and gases as a landfill.

The leadership exercised by the Central Government proposing public policies on the integral management of solid waste, with the publication in February 2014 of the "Policy for the Integral Management of Municipal Solid Waste" by the Ministry of the Environment and Natural Resources, have taken a significant step in terms of the lines of action to follow in this field.

It should be noted that in January 2014, the Ministry of Environment and Natural Resources initiated the "Project to Strengthen Institutional Capacity in Solid Waste Management at the National Level (FOCIMIRS)", with the support of the Japanese people, Through the Japan International Cooperation Agency (JICA), which contemplated the execution of three pilot projects in different places in the Dominican Republic, where the municipality of Moca was chosen for the development of one of the pilot projects, which consists of In the preparation of this ISWM Plan and in the design for the rehabilitation of the landfill.

2 Diagnosis of the current situation of SWM

2.1 Socioeconomic conditions of the Municipality

Moca is the head municipality of the Province Espaillat, which is located in the North Cibao Region of the Dominican Republic. The municipality has a territorial extension of 336km2 and is located within the geomorphological region of the Cibao Valley, specifically within the sub region of the Eastern Valley of the Cibao.

The Espaillat province is made up of 4 municipalities (Gaspar Hernández, Jamao al Norte, Cayetano Germosen and Moca), 11 municipal districts, 50 sections, 299 sites, 115 neighborhoods and 165 sub-neighborhoods. (Statistics Profile Espaillat Province).

Figure 1 Map of Moca

It limits to the north with the Municipality of Jamao to the North, to the south with Province of La Vega, to the east with Province Sisters Mirabal and to the west with Province of Santiago.

The municipality is conformed by an urban zone and six rural sections; It also has eight municipal districts: San Victor, Juan López, Jose Contreras (Villa Trina), Las Lagunas, Higüerito, La Ortega, Monte de la Jagua and Canca La Reyna.

The main neighborhoods of the urban area are: Nuevo Puerto Rico, José Horacio Rodríguez, Muerto Borracho, Puerto Rico Viejo, Juan Lopito, Los Cáceres, Militar, Guachupita, Urbanización La Estela, Salsipuedes, Guaucí, Mejoramiento Social, Urbanización del Este, Villa Elsa, La Piscina, Roque Dabas, Villa Olga, Mairosa, Macotibio, La Milagrosa, Las Flores, Don Bosco, Guaucí Abajo, Residencial Kalaf, Los Panchos, Juan de Dios, La Joyita, Villa Carolina I, Villa Carolina II, Villa Carolina III, Villa Carolina IV, El Corozo, Los Maestros, Eurípides, Quijá Quieta, El Caimito, Yenny María I, Yenny María II, Estancia Nueva, Los López, Miguel A. Michel, Residencial Alexandra, Milito, Nueva Suiza, Residencial Moronta, Los Cocos, Villa Caimito, Pueblo Arriba, La Estación, Los Loros, El Bolsillo, Altos de Chavón, Miguel Rodríguez, Los Torres, Villa Delia, El Cementerio, San José, De Foro, Los Profesionales, Montreal and el Batuto1.

Table 1 Rural Sections and Sites of the Municipality of Moca

SECCIÓN RURAL	PARAJES
El Algarrobo	El Algarrobo, Santa Eduviges, Quebrada de la Jagua, Los Cadillos, La Penda, Los Pomos
LLenas	Los Hilario, El Corozo, Isleta, Llenas-Hinchas
Paso de Moca	Paso de Moca, San Francisco Arriba, La Ermita, Estancia Nueva Abajo, Estancia Nueva, Barrancón
San Luis	San Luis, Quebrada Honda, Los Jengibres, Los Jengibres Abajo, La Piragua y Porra
Santa Rosa	Santa Rosa, Rincón de los Jiménez, La Playita, Los Bretones y La Furnia
Zafarraya	Zafarraya, Los Cercados, La Chancleta, La Soledad, Cacique Soledad, La Rosa de Moca, El Picacho

Source: ONE.

2.2 Population

According to the 2010 census, the population of Moca was 94,981. See table with the municipalities and municipal districts that make up the province Espaillat.

Table 2 Data Census 2010 for Moca

Province / Municipality / D.M.	Inhabitants
Espaillat Province	231,938
Moca Municipality	179,829
Moca	94,981
José Contreras (D.M.)	4,498
San Víctor (D.M.)	21,009
Juan López (D.M.)	14,777
Las Lagunas (D.M.)	15,241
Canca la Reyna (D.M.)	10,998
El Higüerito (D.M.)	9,673
Monte de la Jagua (D.M.)	5,810
La Ortega (D.M.)	2,842
Municipio Cayetano Germosén	6,911
Cayetano Germosén	6,911
Municipio Gaspar Hernández	37,378
Gaspar Hernández	15,182
Joba Arriba (D.M.)	3,601
Veragua (D.M.)	15,320
Villa Magante (D.M.)	3,275
Municipio Jamao al Norte	7,820
Jamao al Norte	7,820

Based on these data and taking into account that the percentage of increase of the population is of 1.3% is estimated that for the year 2015 the population is of 101,317.

2.3 Health indicators

Moca belongs to Regional II of the Ministry of Public Health and Social Assistance. This municipality has a provincial public hospital, 6 private health centers and 40 Primary Care Units.

The Toribio Bencosme provincial hospital is located in the urban center of the municipality; According to the annual report 2010 of the Ministry of Public Health and Social Welfare, this hospital had 150 beds, but currently has 90 beds. This hospital is the best equipped of the Espaillat Province so it offers services to other urban and rural settlements nearby. Among the support services offered by the hospital are the laboratory, Blood Bank, X-ray, Sonography, electrocardiogram, social work, Dentistry, Medical specialties available to the Hospital are: Pediatrics, Gynecology and Obstetrics, Surgery, Internal Medicine , Pneumology, Urology, Dermatology, Psychology, Epidemiology, Orthopedics, Cardiology and General Medicine consultation.

Table 3 List of First and Second Level Care Centers and their Addresses

No.	UNAP	DIRECCIÓN
1	Villa Cafetalera	C/ Principal, Alto de los Pozos, Villa Cafetalera, San Víctor
2	Barrio Viejo Puerto Rico	C/ Rodrigo Cervantes No. 37, Moca ,Centro Comunal Santa Luisa de Marillac.
3	Juan López	Carr. El Mamey, frente al Cuartel de la P.N., Juan López
4	Veragua	Can. La Entrada Trujillo, Gaspar Hernández
5	San Víctor	C/ Principal, Distrito Municipal de San Víctor
6	Los López	C/ Principal, Los López I, Centro Comunal, Moca
7	Tierra Dura	Callejón de Balbina, Tierra Dura, El Higüerito
8	Los Brazos	Carr. De Los Brazos, Jamao al Norte
9	Palma Herrada	Callejón de Palma Herrada, Villa Trina
10	Los Panchos	Barrio Milito, Casa No. 16 Av. Constitución, (Av. Sosa) Moca
11	Santa Rosa	C/ Principal de Santa Rosa, Moca
12	Las Guazumas	C/ Principal de Las Guazumas, Moca
13	Bonagua	Carr. Cruz del Padre, Bonagua
14	Canea La Reyna	Entrada Reyna de los Angeles
15	El Corozo	Carr. Vieja El Corozo, detrás del centro comunal, Moca
16	Sal Si Puedes	C/ Ángel Morales, Esq. Independencia, Logia Perseverancia, Moca

No.	UNAP	DIRECCIÓN
17	Los Puentes	Carr. Los Puentes, Puesto Grande
18	San Francisco Arriba	Carr. Principal, San Francisco Arriba (en el Centro Comunal)
19	La Manzana	Residencial La Manzana, Moca
20	Guaucí	Carr. Duarte (al lado de la Farmacia Jiménez), Guaucí, Moca
21	Reparadero	C/ Principal, El Reparadero, Moca
22	Monte de la Jagua	Carr. Principal Proximo entrada de los perez de Monte de la Jagua
23	Zafarraya	Carr. Principal de Zafarraya (Cruce Zafarraya)
24	Las Flores	C/ Wilber en el club de las flores , Moca
25	La Yagua	Carr. Principal, La Yagua, Gaspar Hernández
26	La Isleta	C/ Principal, dentro de la Escuela Primaria de La Isleta
27	Caimito, Puesto Grande	Carr. Puesto Grande - Jamao, frente al Cuartel de la P.N.
28	Las Lagunas	C/ Principal de Las Lagunas, en la Parroquia de la comunidad
29	Cuero Duro	C/ Principal, No. 27 Cuero Duro,San Victor, Moca
30	Boca Férrea	C/ Principal, en el Centro Comunal de Boca Férrea
31	El Higüerito	C/ Principal de El Higüerito
32	Joba Arriba	Callejón frente a la escuela Joba Arriba
33	Villa Progreso	C/ DUARTE. KM.2· 18
34	Batey Ginebra	C/Duarte No. 374 Batey Ginebra
35	Quebrada Honda	C/ Principal, Quebrada Honda, Moca
36	La Ermita	C/paso de moca San Víctor
37	Ceiba de Madera	C/ San Víctor tamboril
38	Algarrobo	C/principal el algarrobo
39	La Guama	C/ Principal, La Guama
40	Manuel Rodríguez	C/Principal, Manuel Rodríguez/ entrada refresco imperio
		Second Level
1	DR. TORIBIO BENCOSME	CARRETERA DUARTE MOCA LA VEGA #1

SOURCE: Regional Management II Ministry of Public Health

2.4 Education

Moca belongs to the education district 06 of the Regional 06 of the Ministry of Education. Moca has a large student population distributed in:

84 schools of Basic Education

14 High School and High School

3 Higher Education Centers

In addition, 31 private schools, most of these reach middle school. It also has a polytechnic run by Srs. Religious. Laura Vicuña Labor School, Mother Mazzarello, School of Fine Arts and Altagracia School.

There is an Education Department in the City Hall where 3 permanent staff and 3 technical advisers work. Through this direction the City Hall offers scholarships to students of basic and average, as well as university students. In addition, the management maintains a program of "Citizen Education" directed to students of the urban zone from 4th. Until the 8th. Degree of basic, oriented to the protection of the environment and the natural resources of the municipality.

2.5 Commercial trend

The Municipal Services Management Office of Moca (GSM) conducted a survey to determine the commercial trend in the municipality, which resulted in a total of 2384 businesses and industries by 2015.

Table 4 Types of shops in Moca

TYPE OF COMMERCE	CANTIDAD
Spare and related shop	142
Car wash	3
Free trade zone	1
Health and related products	75
Commercial and related banks	75
Fuel Stations	17
Clinics and related	84
Hotels, motels and related	18
Stalls	122

TYPE OF COMMERCE	CANTIDAD
Discotheques and related	17
Restaurants	34
Squares and commercial buildings	17
Vehicle Dealer	45
Real Estate Management	18
Exchange agencies	3
Transport companies	32
Slaughterhouses	4
Coffee shops	135
Schools	53
Public service companies	60
Shops and related	1,026
Grocery stores	260
Factories and related	38
Supermarkets and related	65
Street vending	40
GRAND TOTAL	2,384

2.6 Environmental Indicators

The municipality of Moca is located within the life zone of the Humid Subtropical Forest, which covers much of the Eastern Valley of Cibao. In this area of life the ecological conditions are the result of a complicated climate system, influenced mainly by the presence of the subtropical anticyclones and the direction of the trade winds, which in most of the year are dominant.

The rains in this area of life are more frequent during the months of April to December, with varying intensity according to the orographic situation where the land is located. As much of the land in this area of life is suitable for agriculture, the original natural vegetation has been removed for planting and is scarce; However, it is possible to detect some small forests of oak, mahogany and royal palm trees originating from the flora of the area. The lands of Moca have been classified Class 1, by the Classification System of Soils according to their Capacity of Use, of the Organization of American States (OAS), and its use is

predominantly agricultural. Most of the agricultural land is located southeast of the municipality and the most cultivated products are coffee, avocado, lemon, zapote, yucca, milky, chinola, sweet potato and bananas, among others. Being located within the Eastern Valley of the Cibao, the municipality is located in one of the zones with greater rainfall of the country, situation that favors the agricultural production. Agricultural land on the urban periphery is under constant threat of its use for urbanization.

Another resource that counts the municipality are its water sources, being the most important the rivers Moca and Licey. The first is born on the southern slope of the Cordillera Septentrional and crosses the central area of the municipality, and the second course to the south of the territory. In the case of the rivers, streams and canyons of the municipality, the problems that are presented are the contamination by the discharge of waste water by farms, stables and houses located in its vicinity and the deforestation of the banks. As far as mineral resources are concerned, there are only a few quarries of isolated aggregates in the municipality whose material is mainly used for road construction. The municipality of Moca is vulnerable to seismic risk due to its proximity to the Cordillera Septentrional, since this mountain range presents a fault with active and inactive stretches. Also, some communities such as Macotibio, Los Panchos, Isla Perdida, Viejo Puerto Rico, La Punta, Española and Jarro Sucio, among others, are vulnerable to flooding because they are located in the vicinity of the Moca River. The municipality does not have a risk management plan.

According to data from the VIII National Census of Population and Housing, in 2002 a significant 47% of the population still used latrine to dispose of sanitary waste. According to the same source, those households that did not receive the garbage collection service, preferred to burn it. Both practices are considered harmful to the environment, although the results of the most recent census will have to be awaited to verify if the situation has changed.

In terms of environmental management in the municipality, the Ministry of Environment and Natural Resources has a Forestry Sub-Management that provides service to the municipality and province. In the city hall there is an Environment Office that handles minor issues related to the environment.

2.7 Relationship of the ISWM Plan with the Master Plan of Strategic Development of the Moca Municipality

The ISWM plan developed within the framework of the FOCIMIRS project is related to the Municipal Development Plan for the 2011-2016 management, in the Strategic Lines of Development number 5, which says **"A municipality with an efficient management of solid waste, which has appropriate public facilities and offers quality municipal services".** With the following objectives:

- Implement comprehensive management of solid waste
- Improve the supply of collective public facilities in urban and rural areas.

The programs and projects proposed in the plan were:

- Relocation of the municipal landfill with the landfill modality.
- Articulation of the solid waste collection system.

Table 5 Master Plan Technical Sheet

Línea Estratégica 5: Un municipio con una eficiente gestión de los residuos sólidos, que cuenta con equipamientos apropiados y que ofrece servicios municipales de calidad	
Nombre del Proyecto: ***5.1.1. Reubicación del vertedero municipal con la modalidad de relleno sanitario***	
Objetivo al que contribuye: 5.1. Implementar una gestión integral de los residuos sólidos	
Justificación y descripción del proyecto: Los vertederos a cielo abierto son sistemas antiguos de deposición de residuos sólidos en los cuales no se toman en cuenta los efectos ambientales negativos como la contaminación de las aguas subterráneas y de escorrentía superficial, de los suelos y del aire. El vertedero de Moca se encuentra dentro del área urbana y esta condición agrava los efectos negativos que causa. La disposición de un nuevo vertedero de residuos sólidos a modo de relleno sanitario en un lugar apropiado y la clausura del vertedero existente, es una acción de máxima prioridad en razón de que con ello se mejorará las condiciones ambientales en general del área urbana del municipio. Además facilitará la disposición final de los residuos sólidos.	
Principales actividades: • Contratar un consultor para la formulación del proyecto • Formular el proyecto que integre la adecuación de los terrenos, la impermeabilización del relleno, la red de captación de líquidos, una planta de tratamiento de líquidos residuales y la combustión o tratamiento del bio-gas • Adquirir los terrenos para el emplazamiento del vertedero • Ejecutar las obras de construcción del proyecto	
Principales aliados estratégicos: • Ministerio de Medio Ambiente y Recursos Naturales • Ministerio de Salud Pública • Federación Dominicana de Municipios (FEDOMU) • Sector privado • Asociación para el Desarrollo de la Provincia Espaillat (ADEPE)	
Costo: RD$60,000,000.00	**Duración:** 2 años.

2.8 Existing Management Structure for SWM

The municipal administrative structure in charge of the Integrated Management of Solid Waste in the municipality of Moca is presented in the following organization chart.

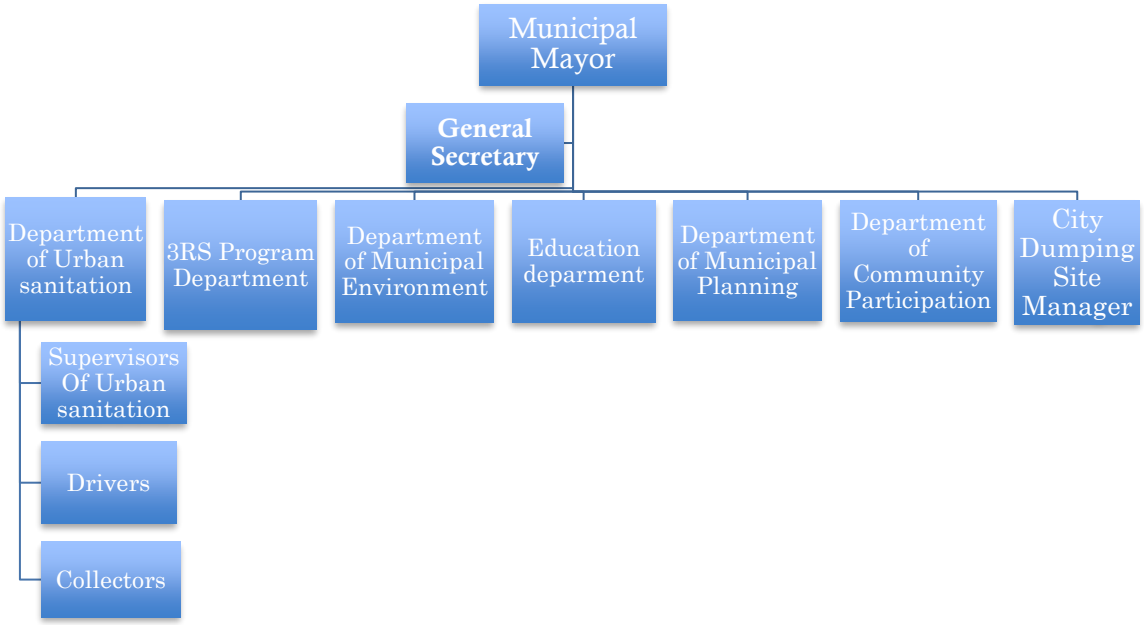

Figure 2 Organization of municipality

2.9 Current SWM rates

The rates that are currently established by the Urban sanitation service are presented below:

Table 6 Residential tariff structure for residential users

Type	Service	Type of service	Tariff
Urban sanitation	Residential R1	Low zone	RD$50.00
	Residential R2	Low Medium	RD$80.00
	Residential R3	High Medium	RD$150.00
	Residential Re	Special	RD$200.00- RD$1000.00

Table 7 Urban sanitation fee structure commercial users

TYPE	DETAIL	Sector 1	Sector 2	Sector 3
C1	Beauty centers, offices, grocery and related, laundry car, opticians, betting stalls, exchange agencies and coffee shops.	RD$100	RD$200	RD$300
C2	Shops and related, electronics, hardware store, bookstores, transport companies, associations, insurers, telecommunications, Emp.De agua, mass service to the population, spare parts shop, workshops.	RD$300	RD$600	RD$900
C3	Supermarkets and supermarkets, casinos, discos, bars, clubs, Reacreativo, restaurants, billiards, schools, universities, training centers, shopping plazas, gas stations, lodging houses, hotels, car distributor.	RD$1000	RD$1500	RD$2000
C4	Health and related products, veterinary, clinics, hospitals, health centers, banks and businesses with high production of garbage.	SPECIAL		

Table 8 Special commercial urban cleaning tariff structure

TYPE	DETAIL	SECTOR 01	SECTOR 02	SECTOR 03
Factories and Manufacturing	Zona Franca, industries, slaughterhouses, any process of transformation.	RD$2,000.00	RD$3,500.00	RD$5,000.00
Special	Industries that due to its high production of waste deserve a particular study of its tariff.			

2.10 Generation and composition of household solid waste

With the FOCIMIRS Project, the solid waste characterization was carried out in the municipality of Moca, calculations of the sample size were established in 100 samples. The sampling areas were chosen according to the socioeconomic quintile criteria 2,4 and 5 that could be defined in the field with the help and knowledge of the reality by the local technical team. The sampling date was from March 21 to 28, 2015 and the per capita generation (kg / hab-day), density (kg / m3) and physical composition of the solid waste were measured. Sampling sectors: Villa Carolina, Residencial Moca, Old Puerto Rico, Villa Estela, Maco Tibio, The Masters, Euripides, Los Cáceres, La Soledad and Carolis. View charts and tables.

As a result of the characterization for the municipality of Moca, the average

generation per capita of municipal waste reaches 0.77 kg / hab / day.

Meanwhile, the density of waste for the highest quintile reaches 156.23 kg / m3 and 182.26 kg / m3 and 259.85 kg / m3 for the middle and low quintiles of this municipality.

Quintil Socio Económico
0.85

Table 9 Generation per Capita of Household Solid Waste per Quintile

SOCIO ECONOMIC QUINTILE	Mocha. Generation Kg / room / day
2	0.85
4	0.64
5	0.83
Avarage	**0.77**

Table 10 Density of Household Solid Waste per Quintile

SOCIO ECONOMIC QUINTILE	Moca. Density kg / m^3
2	259.85
4	182.26
5	156.23
Avarage	199.45

Table 11 Daily Estimation of Waste Generation (Moca)

Total amount of waste	Total Population	Kg / person per household	Total amount of Household Waste	Total waste from businesses	% Household Waste	% Waste Businesses
130 TON	101,317	0.77	78.0141 TON	68.9859 TON	60%	40%

Out of a total of 2,384 businesses, it is estimated that 68.9859 tons of waste are generated daily, corresponding to 40% of the total estimated for the municipality of Moca.

Table 12 Physical Composition of Household Solid Waste per Quintile

Type of solid waste	Quintil Sector		
	2	4	5
Paper	3.38	2.58	2.83
Carton	3.18	2.88	2.15
Organic waste	27.78	24.84	24.78
Green waste	2.8	2.36	3.73
Plastic (bottole)	3.52	3.52	3.18
Grass (include bottole)	3.1	2.83	2.54
Tetrapack	3.17	3.1	3.25
Other plastic	3.98	3.68	3.23
Rubber, leather	2.83	2.45	2.11
Textiles & Leather Products	**3.45**	**3.08**	**2.16**
Aluminium	**2.8**	**2.36**	**2.31**
Ferrous material	**2.81**	**2.46**	**2.19**

For each socioeconomic quintile, the percentage of physical composition of the household waste generated in the municipality of Moca was obtained, according to the characterization study carried out by the FOCIMIRS team:

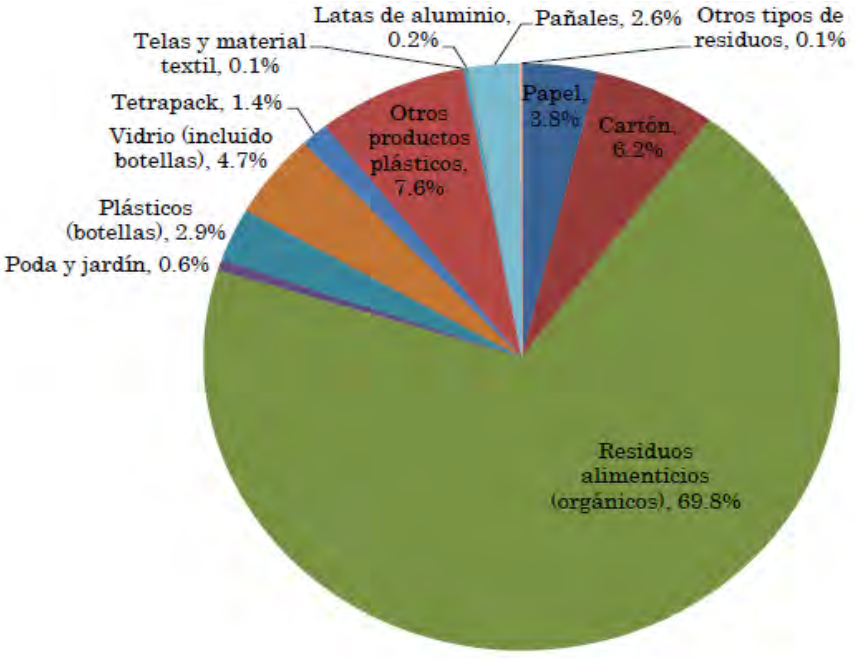

Figure 3 Percent Physical Composition of Household Waste in the Municipality of Moca. High class

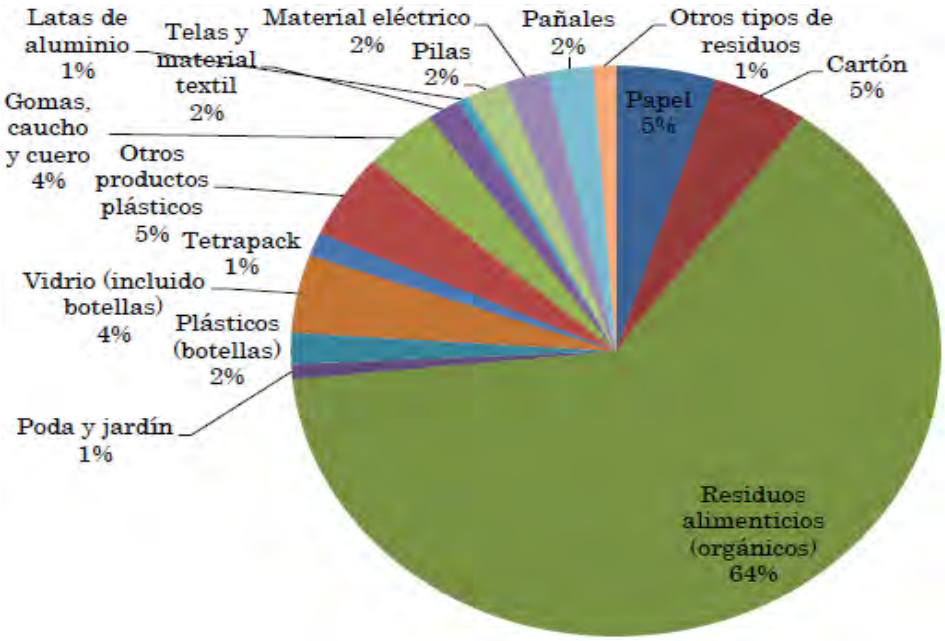

Figure 4 Percent Physical Composition of Household Waste in the Municipality of Moca. Low class

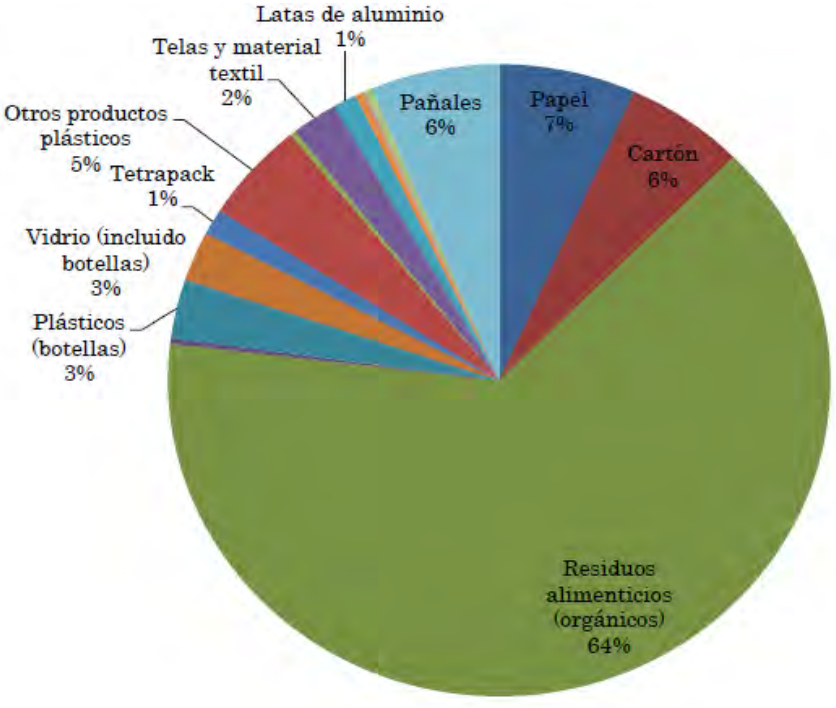

Figure 5 Percent Physical Composition of Household Waste in the Municipality of Moca. Middle class

2.11 Current Solid Waste Flow

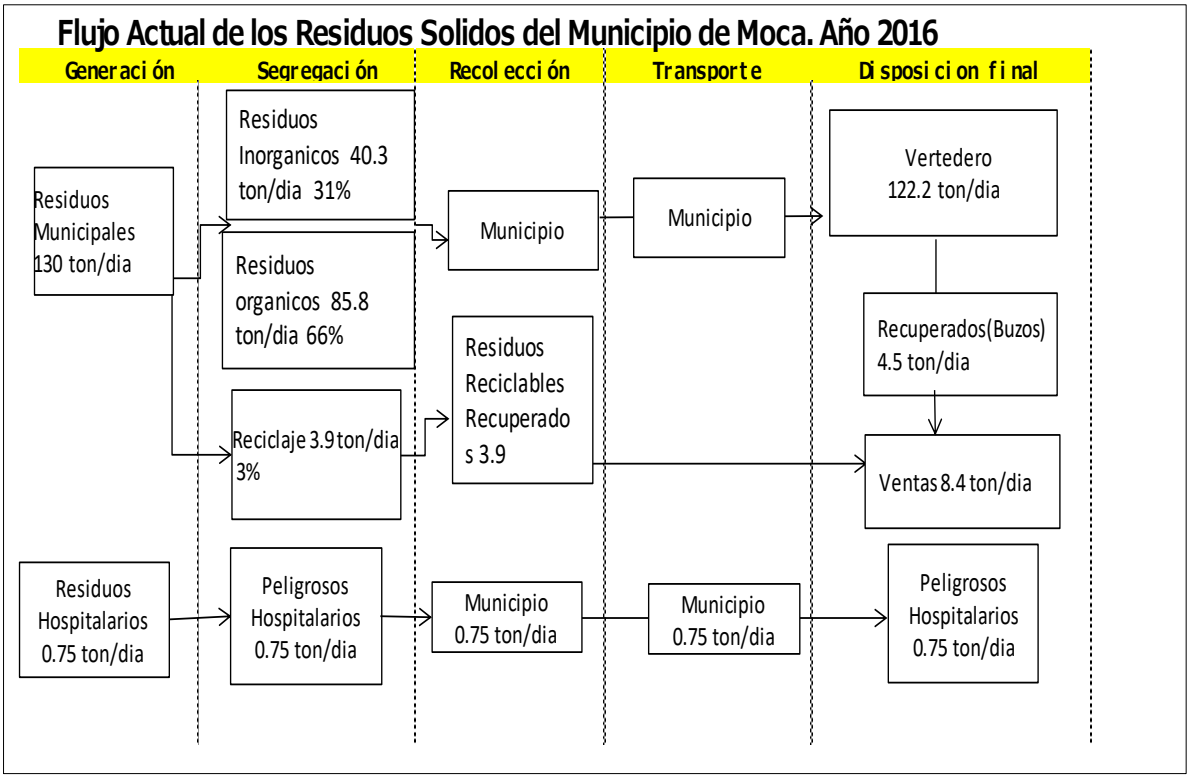

Figure 6 Present waste flow in Moca

2.12 Current Practices for SWM

The management of solid waste in the municipality of Moca consists of manual sweeping, collection and transportation, recycling and final disposal.

2.12.1 Collection and Transportation

The scheme of work of collection and transport is coordinated by the Direction of Urban Cleanliness, being publicized through the media, in which the citizen is informed of the days of collection and any novelty in the service.

At the end of 2011, began to implement "The Waste Collection System", which is developed as follows:

There are 14 Trucks, 108 Door to Door Collectors and 156 Barriers.

On June 17, 2015, the Urban Sanitation route was reorganized, where more

concise routes were established from sector 1 to 6, drawn up by individual plans, which allow the supervisors of Urban Sanitation to work more efficiently.

The collection of solid waste in the Municipality of Moca generates 130 tons per day by both residents and people in transit, according to our latest study.

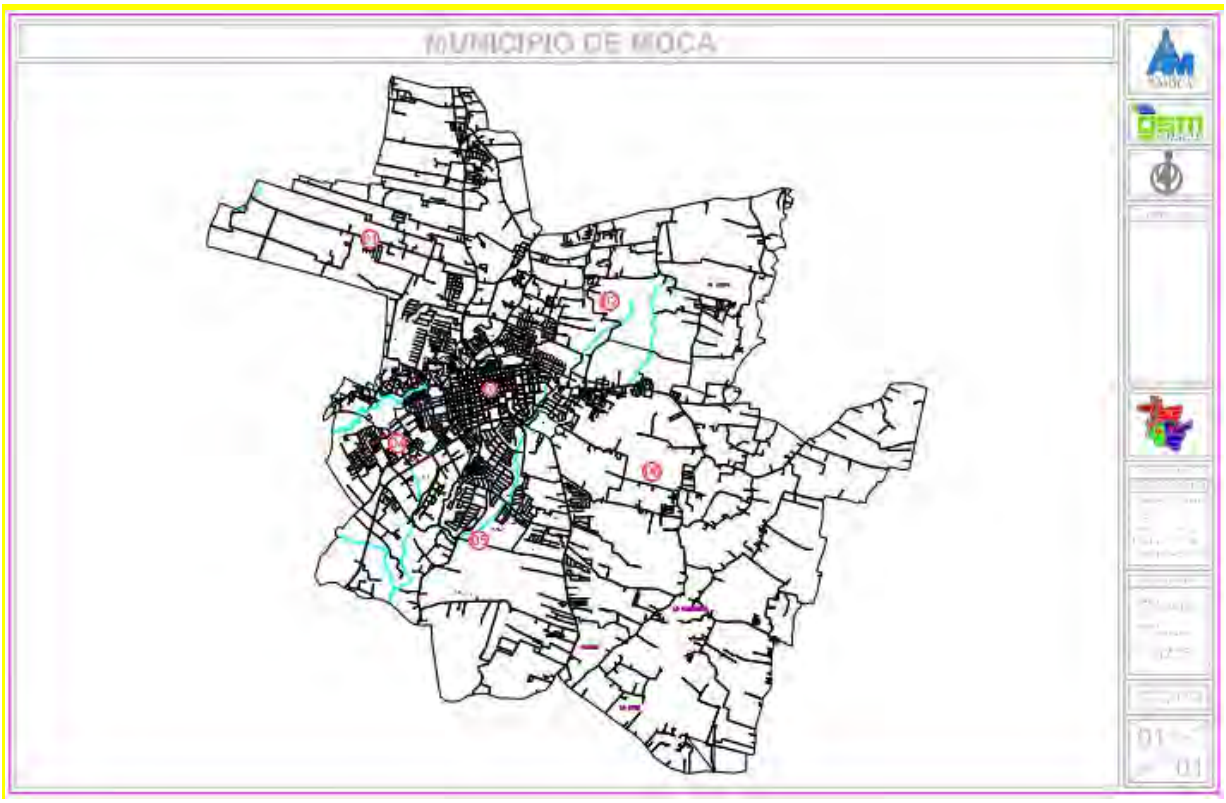

Figure 7 Map of the Municipality of Moca

The Municipality of Moca is divided into sectors, which are highlighted on the map by number as follows:

Sector 1	**Sector 2**
• Villa Delia Gold • Villa Delia • Urb. Gran Estancia • Barrio San Miguel • Barrio Manuel Rodríguez • Barrio El Bolsillo • La Española • Villa Bartola • Barrio Viejo Puerto Rico • Juan Lopito • Res. Los López I, II y III • Barrio las Colinas • Barrio Muerto Borracho	• Res. Evan Luis • Barrio 30 de Mayo • Urb. Buena Vista • Quebrada Honda • Guaci arriba • Guaci • Estancia Nueva • Barrio Santa Ana • Las Flores • Juan López Abajo

Sector 3 • El Centro • Mejoramiento Social • Barrio Roque • Barrio Guachupita • Los Mangos • Barrio Elsa Alexander • San Michel • Urb. Del Este • Calac I y II • Villa Olga • Los panchos • Barrio Militar • Sal si puedes • Barrio Milito • Barrio Juan de Dios	**Sector 4** • Urb. Jenni I y II • Zona Franca Industrial • Barrio Buenos Aires • Barrio La Sajona • Res. Moca • Barrio Los Rodríguez • El Corozo • Barrio Marien García • Barrio Nuevo Puerto Rico • Barrio Boca de Moca • Barrio Irka • Barrio San José
Sector 5 • Los Maestros • Villa Estela • Don Bosco • Juana Saltitopa • Res. Octavio • Los Cáceres • El Batuto • Barrio La Loma • Villa Montreal • Villa Carolina I, II y III • La Milagrosa • Res. Las Palmeras • Eurípides • Urb. Lolita • Res. Caroli • Villa Esmeralda • Res. Sedona	**Sector 6** • La Piragua • Urb Graciela • El caimito • María del Carmen • La Soledad • Urb. ámbar • Villa Elsa • Barrio Del Rosario

It should be noted that, in order to improve the collection service, we have already started to modify the routes and we have raised sector No. 5, which is attached.

2.12.2 Data Registration

The waste treatment register is carried out through the Secretary General who receives a monthly report from the person in charge of the municipal landfill, who supplies the following data through the report using the following formats:

- Numbers of daily trips to the dumping site both by Urban Cleaning and private companies.

Table 13 Direct: Number of Trips

Name of Municipality / D.M.

			1	2	3	4	5	6	7	8	9	10
Type truck												
Name of the company												
Capacity		**Ton**										
		m3										
Date	1-Feb	Mon										
	2-Feb	Tue										
	3-Feb	Wed										
	4-Feb	Thu										
	5-Feb	Fri										
	6-Feb	Sat										
	7-Feb	Sun										
	8-Feb	Mon										
	"Total number of trips"											

- Capacity of the Solid Waste Collection Trucks.

Table 14 Collection: Number of Trips

Name of Municipality / DM

			1	2	3	4	5	6	7	8	9	10
Type of truck												
ID of the Truck (Name)												
Capacity	**Ton**											
	m^3											
Date	1-Feb	Mon										
	2-Feb	Tue										
	3-Feb	Wed										
	4-Feb	Thu										
	5-Feb	Fri										
	6-Feb	Sat										
	7-Feb	Sun										
	8-Feb	Mon										
Total number of trips												

1) Register of equipment used for SWM

As previously mentioned, solid waste management has 14 trucks, 108 door-to-door collectors and 156 scrapers all organized to cover this service at the municipal level.

Among these vehicles we can find a great variety that allow us to adapt to the different situations existing in the city, such as pickup trucks and open box trucks, which are identified in the attached table:

Table 15 Equipment list

Vehicle File	Length	Height	Width
39	320cm	160cm	160cm
11	420cm	270cm	230cm
25	300cm	130cm	180cm
18	280cm	100cm	190cm
33	280cm	160cm	120cm
Rented Truck	330cm	120cm	175cm
51	350cm	190cm	230cm
21	340cm	140cm	220cm
2. 3	340cm	150cm	220cm
53	510cm	200cm	240cm
24	340cm	210cm	240cm
55	640cm	200cm	240cm
15	500cm	200cm	220cm
17	490cm	90cm	210cm

SOURCE: Deprtament of Urban Cleaning

2.12.3 Environmental Education and Promotion of 3Rs

1) 3R'S Program

The "3R" program promotes 3 basic steps (Reduce, Reuse and Recycle) to reduce the production of waste and contribute to the protection and conservation of the environment.

In addition, it aims to change our consumption habits, making them responsible and sustainable. To do this, it focuses on waste reduction, in order to solve one of the major ecological problems of today's society.

This program was implemented in 2012, led by the Mayor and executed by the

Departments of Environment, Urban Welfare, Education, Press and Community Participation, under the coordination of the Secretary General. To date we have 3 platforms, which we call CLEAN POINTS.

These clean points have a platform where garbage is collected from the already ranked community, using this garbage separation scheme:

Figure 8 3R program

- **Platform I. Cast Amelia / Villa Elsa: Inaugurated in the month of May of the year 2012**

These sectors have an average of 260 dwellings and a population of 1,300 inhabitants.

From this platform are collected about 1,001 tons of garbage per day, six days a week that would be 6,006 tons per week.

This platform has 6 containers of 1100 liters.

Photo 1 Opening Villa Elsa and Reparto Amelia platform

- **Platform II. Social Improvement / Barrio Roque:** Inaugurated in September 2014.

The neighborhood Roque has an estimated 375 homes and a population of 1875 inhabitants, while in the neighborhood social improvement has an average of 75 homes with 375 inhabitants, meaning that between these two neighborhoods there is an estimated 2,250 inhabitants.

This platform collects about 1,733 tons per day.

This platform has 7 containers of 1100 liters.

- **Platform III. East Urbanization:** Inaugurated in May of the year 2015.

This sector has an estimated 135 homes and 675 inhabitants, and an estimated 0.5198 tons per day.

This platform has 6 containers of 1100 liters.

This program has been very important, so we intend to expand the whole municipality.

Since June of this year, we have been socializing with the residents of Villa Estela, Carolina, Lolita and Don Bosco communities for the implementation of the 3R'S program.

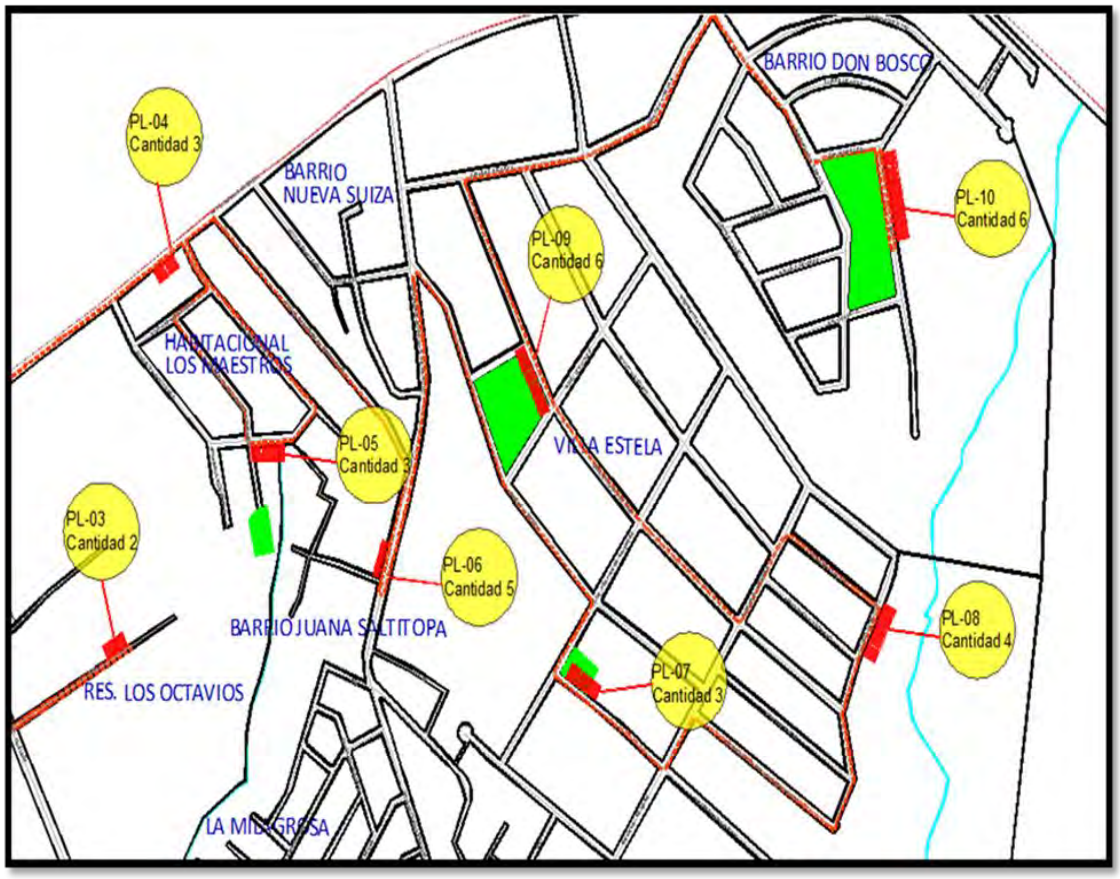

Figure 9 Flat Platform Villa Estela

2.12.4 Final disposal

The disposal in dumping sites is maintained as a common practice in the country and in our municipality.

The municipal dumping site is located in Prolongación Imbert street near the Industrial Free Zone, in the urban area of the municipality. It has a land of an approximate extension of 4.3 hectares and its modality of operation is controlled

by means of compacted and poured in a natural pit. The monthly operating cost of the landfill is approximately RD $ 450,000.00.

The location of the landfill has caused conflicts with the population, since it is located in the urban area, close to several settlements. It is also close to the banks of the Moca River, which increases its environmental impact due to the occasional saturation of the land and the generation of pollution.

At present, about 130 tons of waste per day are deposited in the landfill, and 150-160 tons per day were deposited, of which only 30% corresponded to the Municipality of Moca, and the rest corresponded to waste of other municipalities that were also dumped in the landfill. This situation represented a problem and made the cost of operating the landfill more expensive and worse, since collection for collection was not enough. At present only waste that corresponds to the municipality of Moca is deposited.

Another problem faced in the municipal landfill revolves around the 50 independent waste classifiers (Waste Pickers) that disregard the rules of treatment and management of the garbage, altering security, making difficult the processes of compaction and treatment of waste.

Although Waste Pickers make it difficult to operate within the landfill, it is important to recognize that they perform important work in recovering materials with commercial value and reducing the amount of waste that is buried in the place.

Efforts have been made to keep the landfill under optimum conditions so that it does not affect the environment, but when its useful life is exhausted, good management is difficult.

A properly designed and well managed dump prevents the proliferation of vectors such as rats, flies, mosquitoes, etc., bad odors and the generation of leachate. This practice minimizes its impact on the environment. A landfill such as the one currently in Moca generates an adverse environmental impact such as wind-blown pollution, insect attraction, and the generation of leachates contaminate groundwater.

Another important problem is that we have had difficulty in defining the location of a new landfill due to the opposition of the owners of the adjacent plots. Few

people want a landfill next to their plot. This situation has affected even the collection service, since for a period the landfill was closed by the Ministry of Environment and the waste was transferred to the semi-controlled landfill of Santiago and also to the Vega for final disposal. The cost of transportation during that period was very high.

At the beginning of 2011, an environmental impact study of a new land was started with a view to relocating the landfill; however, these plans have been hampered by the reclamation of inhabitants of nearby settlements who oppose the new FDS. Location.

At present, it has been tried to cover with material and vegetal layer to the landfill, with a view to the closure of the same one.

Photo 2 Excabeter in landfill

Photo 3 Current aspect of the Dumping Site of the Municipality of Moca

2.12.5 Description of Current Costs for the SWM

The municipality allocates monthly financial resources for the maintenance of equipment, personnel, fuel expenses, among others, as shown in the following table:

Table 16 Current budget for SWM in Moca

Description of costs	Valores mensuales
Waste management	RD$1,555,325.81
Remuneration and contributions	RD$1,484,041.51
Newspapers	RD$1,330,218.25
Annual salary no.13	RD$1,237,600.00 (no devengado)
Compensation for overtime	RD$3,400.00
Social security contribution	RD$150,423.26
Contributions to health insurance	RD$69,478.89
Contributions to pension insurance	RD$69,576.88
Contributions to occupational risk insurance	RD$11,367.49
Recruitment for services	RD$16,500.00
Materials and supplies	RD$54,784.30

Description of costs	Valores mensuales
Food and drink for people	RD$1,220.00
Fuel, lubricants, chemicals and related	RD$51,764.30
Gasoil	RD$42,300.00
Gas LPG	RD$9,464.30
Miscellaneous products and supplies	RD$1,800.00
Solid Waste Management	RD$245,266.92
Recruitment of services - rent and lease	RD$223,580.00
Rental of transport, traction and lifting equipment	RD$163,580
Rental of land	RD$100,000.00
Materials and supplies	RD$4,309.31
Movable, immovable and intangible assets	RD$17,377.61
TOTAL COSTS	**RD$6,773,801.95**

2.12.6 Current legal basis for SWM

The municipalities of the Dominican Republic are governed by Law 176-07 of the National District and Municipalities, in which there are several articles of relevance regarding the management of solid waste. The following is a summary of the current regulations:

- The Constitution of the Republic
- The General Law on Environment and Natural Resources 64-00
- The General Law on Public Health and Social Assistance 42-01
- The Law on the Municipal District and Municipalities 176-07
- Law 120-99
- Law 83-89
- The National Development Strategy -END, Law 1-12
- The Standard for the Environmental Management of Non-Hazardous Solid Waste.
- Resolution No. 15/2009
- General Law of Education Law 66-97
- Law 163-03 on Regime of Cooperation and Financial Assistance of the Executive Power to the municipalities.

3 Assessment of the Current Situation and Identification of Critical Problems

For the analysis of the problem in the SWM, a participatory workshop was held at the City Hall of Moca on June 12, 2015 titled **"Analysis of the problem and possible solutions in the management of Solid Waste in the Municipality of Moca"**, in the Which were attended by representatives of the different sectors of society and management departments of the City Hall. The workshop was supported by the Ministry of Environment, JICA and the Dominican Federation of Municipalities.

The participants were grouped into four groups analyzing the problem and its possible solution, then the team for the preparation of the ISWM Plan carried out another workshop where each of the components and their possible execution period were analyzed, establishing that the ISWM Plan would be developed within 15 years.

Group 1 : Generation, Storage and Delivery.

Group 2 : Collection and Transportation.

Group 3 : Transfer and Intermediate Treatment

Group 4 : Final Provision

Results by team are shown below:

Table 17 Results Team 1: Generation, Storage and Delivery

Problems	Solutions	Activities	Execution time
Excessive generation of solid waste.	Educate the citizen to responsible consumption through campaigns with non-profit institutions, teaching them to separate and pack correctly.	• Expand 3RS program and continue educating. • Raise awareness in the schools and propose separation of waste.	5 years: 25% (Educated inhabitants 25,330) 10 years: 50% (Educated inhabitants 50,659) 15 years: 100% (Educated inhabitants 101,317)
Citizens deliver the open packages	Improve the quality of packaging	• This will improve with education and awareness programs.	5 years: 25% 10 years: 50% 15 years: 100%
Lack of resources for the implementation of educational programs.	Apply programs that allow income and encourage the Neighbors Boards and entrepreneurs for collaboration in environmental education of citizens.	• Talks with 120 Community Councils	5 years: 30% (36 educated Community Councils) 10 years: 70% (49 Educated neighborhood meetings) 15 years: 100% (120 Community Council encouraged)

Table 18 Results Team 2: Collection and Transportation

Problems	Solutions	Activities	Execution time
High operational cost of transport of the City Hall	Improve the viability of collection routes and change vehicles that are in poor condition.	• Establish monitoring mechanisms. • Improve vehicle fleet. • Restructure routes.	5 years: 25% 10 years: 50% 15 years: 100%
Lack of staff training.	Train employees to do their job better.	• Plan de capacitación	1 año: 50 % 2 año: 100%
Poor distribution in collection times and constant problems with trucks.	Design efficient routes to avoid causing corks, modify the schedules, change the trucks and have an emergency truck in case they are damaged.	• Efficientize routes. • Plan an emergency budget for car rentals.	5 years: 25% 10 years: 50% 15 years: 100%

Table 19 Results Team 3: Transfer and Intermediate Treatment

Problems	Solutions	Activities	Execution time
Excess of plastics by the generating source, which causes a jam in the equipment of the dumping site.	Regularize and sanction companies that use non-recyclable plastics.	• Educate local businesses about the use of recyclable materials. • Create ordinance to regulate this situation.	5 years: 50% 10 years: 75% 15 years: 100%
Lack of connection with companies that facilitate or take advantage of waste.	Create agreements with the recycling company to handle recyclable Waste.	• Create institutional arrangements. • Source segregation.	5 years: 50 % 10 years: 100%

Table 20 Results Team 4: Final Provision

Problems	Solutions	Activities	Execution time
The City Hall does not have adequate physical space for the management of waste in the Dumping Site.	Transfer of the Dumping Site to an adequate space and regularized by environment.	• Rehabilitation and closure of the Dumping Site.	4 years
Lack of equipment for the operation of waste and presence of Waste Pickers without adequate protection.	Acquisition of new equipment for good management.	• Acquisition of personal protective equipment for Waste Pickers and training of Waste Pickers.	5 years: 25% 6 years: 50% 10 years: 100%

For the conceptualization of this ISWM Plan of Moca, a workshop was held to analyze the problems of the municipality with the different sectors and / or actors, analyzing the current situation of each component.

3.1 Critical Issues Prioritization: Landfill Rehabilitation Design

Based on the conclusions of the problem analysis workshop, it was identified that the main problems are due to the impacts caused by the landfill, since for the maintenance and treatment of the waste, financial support is needed according to the operational cost, which Has not been developed in Moca. In addition, the current use of waste is minimal at all stages and hospital waste is mixed with solid household waste.

Based on the above, in a joint work it was considered that the Pilot Project to

work through the FOCIMiRS Project should be related to the rehabilitation of the existing final disposal site. Thus, the steps for rehabilitation were defined.

3.1.1 Steps for Rehabilitation of Moca Dumping Site

To proceed with the design of the rehabilitation, a series of steps were exhausted, under the supervision of the JICA expert team of the FOCIMiRS project:

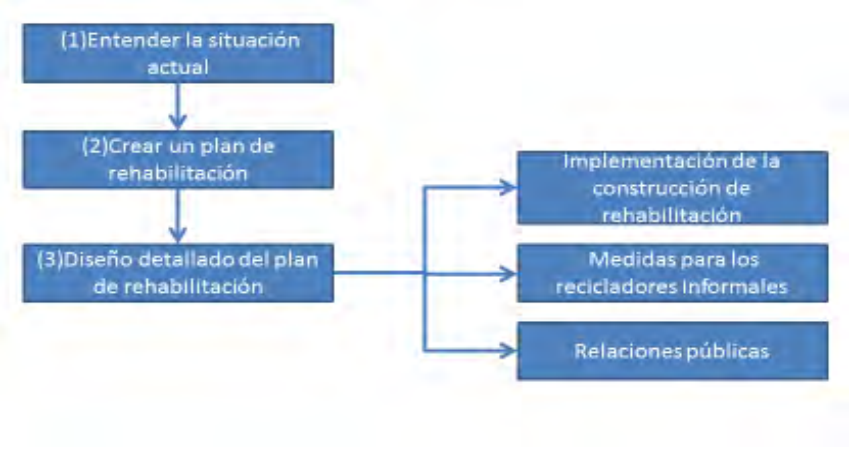

Figure 10 Steps for the Design of Dumping Site Rehabilitation

1) Identification of the Current Status of the Final Disposal Site

From a first survey of the areas affected by the Dumping Site the following questions arise:

Figure 11 Actual situation of dumping site

- What is the remaining capacity of the existing Dumping Site?
- What influence does environmental pollution have on the outside?
- How many more years can be used?
- How much waste is still available?
- What is the target environmental value when we take action?
- What measures are required for informal recyclers?
- What is the cost of a rehabilitation or technical closure?
- How would you operate after the rehabilitation?

Photo 4 View of the Moca River behind the landfill

2) Preliminary studies

In order to answer the above questions, preliminary studies were carried out, consisting of:

- Water quality study: upstream sampling (before Dumping Site, downstream (after Dumping Site) and into the Dumping Site (leachate).
- Topographic study.

The sampling points for the study of water quality and leachate are shown in the following figure:

①Río arriba (antes del vertedero), ②Río abajo (después del vertedero), ③Vertedero

Photo 5 Sampling points

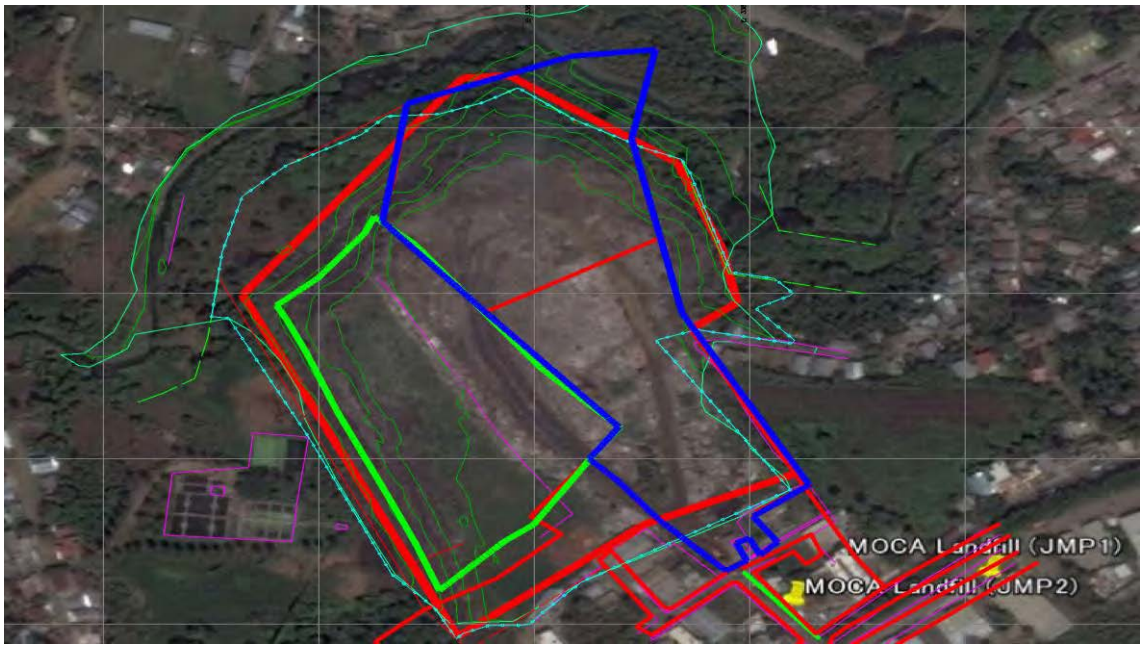

Photo 6 Current Dumping Site condition: Current Dumping Site area in blue; Green area portion of previous use.

3) Rehabilitation Plan Design

After carrying out the previous steps, proceeded with the detailed design of the Rehabilitation Plan:

4) Goal of the Rehabilitation Plan

(1) Reducir los impactos ambientales negativos

(2) Reduce negative environmental impacts

Preventing waste from collapsing.

- Decreasing scattered waste
- Avoiding Leachate Discharge

(3) Check the remaining capacity to pour waste.

(4) Reduce negative environmental impacts through the following activities:

Table 21 Activities for rehabilitation

Items	Function
Tilting the ground (1: 2.0)	- Prevent collapse
Ground cover (t = 50cm)	- Prevent collapse
Drainage system	- Prevent foul odors and scattered waste
Leachate System	- Prevent the infiltration of rainwater
(Catchment network + lagoon)	- Prevent the infiltration of rainwater
Ventilation of gases	- Prevent the emanation of leachates

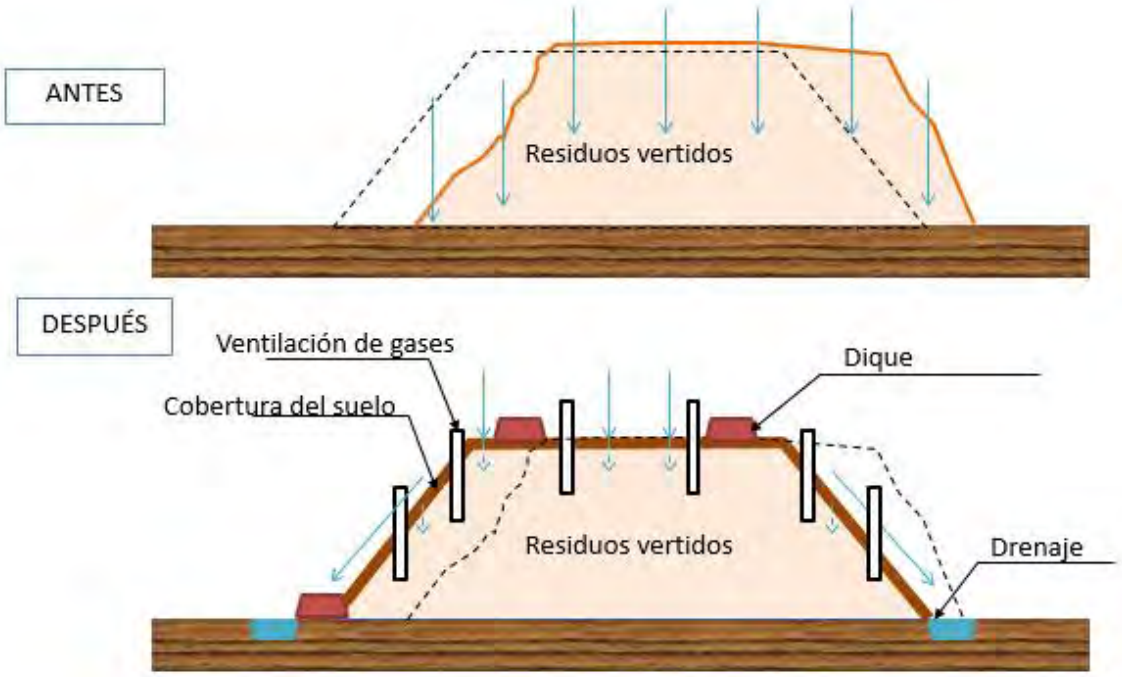

Figure 12 Moca Rehabilitation Plan

4 Policy, objectives and conditions for the ISWM

4.1 Policy

The overall goal of the ISWM Plan will be to achieve integrated management of municipal solid waste that, while avoiding and / or minimizing negative impacts on the health of the population, is environmentally sustainable and socioeconomically viable.

4.2 Objectives of ISWM

The objectives of the ISWM have been established in different deadlines and for each component, but in general, we have aligned them with the Solid Waste Management Policy of the Ministry of Environment:

1. Encourage the creation of a Municipal Solid Waste Management System based on the improvement of economic, technological and environmental conditions, with social and economic inclusion of Waste Pickers.
2. Encourage public participation and public commitment with the actions that are implemented, in order to optimize the management of municipal solid waste.
3. To reaffirm, clarify and / or strengthen the institutional framework for the integral management of municipal solid waste, at national and municipal level.
4. Promote the training of human resources at all levels with a focus on participation.
5. Encourage the incorporation of scientific research aimed at solving the problems of national, regional or provincial reality.

4.3 Planning Conditions

In order to achieve the implementation of the plan, the activities to be carried out in its three (3) stages: five (5) years, ten (10) years and fifteen (15) years.

4.3.1 Estimate of the Future Flow of Solid Waste

By 2015 the municipality of Moca generated 130 tons / day for a population of

101,317 with an increase of 1.3% per year.

Taking into account what is currently generated and the annual increase we would have until 2031, a waste generation of 57,594 tonnes / year, which would represent 157.8 tonnes / day, is projected. We would distribute solid waste in the following way:

Table 22 Amount of generation per year

	Year	Population growth	Population	Amount of solid waste Ton / day	Amount of solid waste Ton / year
0	2015		101.317	130,0	47.450
1	2016	0,013	102.634	131,7	48.067
2	2017	0,013	103.968	133,4	48.692
3	2018	0,013	105.320	135,1	49.325
4	2019	0,013	106.689	136,9	49.966
5	2020	0,013	108.076	138,7	50.615
6	2021	0,013	109.481	140,5	51.273
7	2022	0,013	110.904	142,3	51.940
8	2023	0,013	112.346	144,2	52.615
9	2024	0,013	113.807	146,0	53.299
10	2025	0,013	115.286	147,9	53.992
11	2026	0,013	116.785	149,8	54.694
12	2027	0,013	118.303	151,8	55.405
13	2028	0,013	119.841	153,8	56.125
14	2029	0,013	121.399	155,8	56.855
15	2030	0,013	122.977	157,8	57.594
16	2031	0,013	124.576	159,8	58.343

Based on the above information, we could determine that the future flow would be the following:

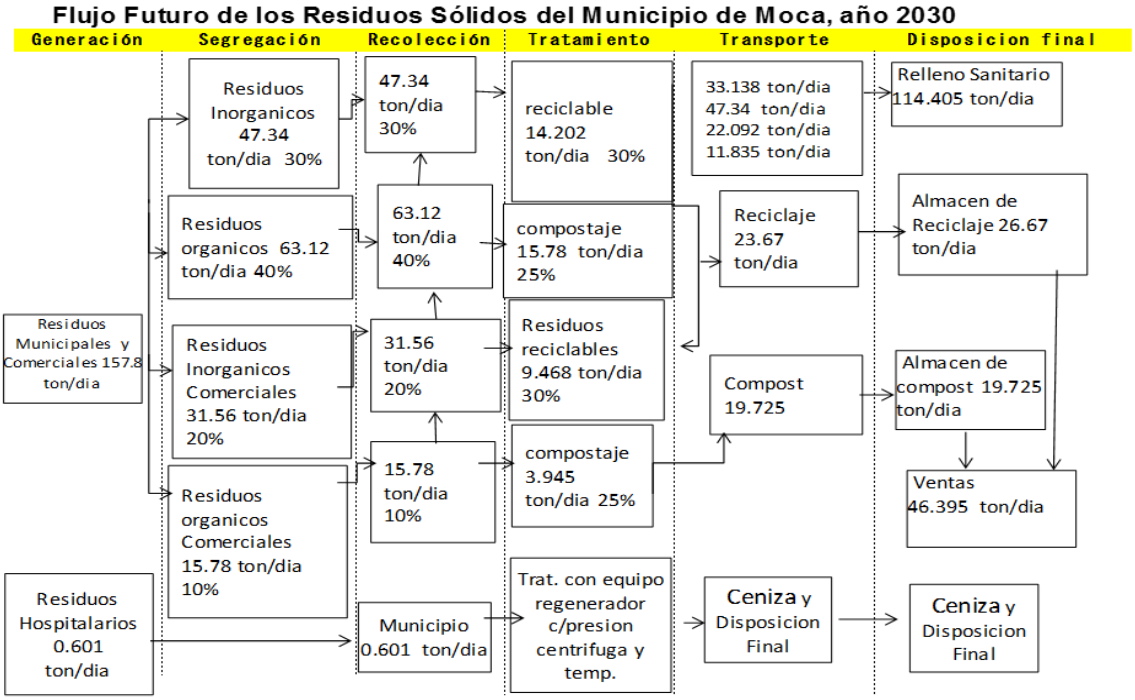

Figure 13 Future waste flow in Moca

5 Component Plans for each Phase

5.1 Strategic Plan for Storage, Collection and Transportation

Table 23 Component of Dissemination of information to the population

Objectives	Activities	Period of Execution		
		5 years	10 years	15 years
Educate the citizen to responsible consumption through campaigns with non-profit institutions, teaching them to separate and pack correctly.	Expand 3RS program and continue to educate.	25% (Educated inhabitants 25,330)	50% (Educated inhabitants 50,659)	100% (Educated inhabitants 101,317)
	Raise awareness in schools and propose separation of waste.	25%	50%	100%
	This will improve with education and awareness programs.	25%	50%	100%
	Improve the quality of packaging.	25%	50%	100%
Apply programs that allow income and encourage the Neighbors Boards and entrepreneurs for collaboration in environmental education of citizens.	Talks with 120 Community Councils.	30%(36 Educated Community Councils)	70 % (49 Educated Community Councils)	100%(120 Educated Communit y Councils)
	Valorización de los residuos	50%	75%	100%
Responsible	Secretario General, Director Aseo Urbano y Planeamiento Urbano.			

Table 24 Strategic Intermediate and / or Recycling Treatment Plan

Objectives	Activities	Period of Execution		
		5 years	10 years	15 years
Improve the viability of collection routes and change vehicles that are in poor condition.	Create plans where the routes are reflected by each sector, to allow us to better visualize the exact location of each clean point and thus recommend to the truck waste collector, a fluid, clear and well defined route, with a logical meaning that guarantees us the savings Of time and money.	100%		
	Improve the decoration of the sectors.	25%	50%	100%
	Relocate containers in strategic locations.	50%	100%	
	Also, through the plans to visualize which are the sectors that are missing to intervene in this sense, in order to analyze what is the appropriate sequence for such intervention.	25%	50%	100%
	Establish monitoring mechanisms.	25%	50%	100%
	Improve vehicle fleet.	25%	50%	100%
	Restructure routes.	25%	50%	100%
Train employees to do their job better.	Training plan	100%		
Design efficient routes to avoid causing corks, modify the schedules, change the trucks and have an emergency truck in case they are damaged.	Efficientize the routes.	25%	50%	100%
	Plan an emergency car rental budget.	25%	50%	100%

Table 25 Component of Recycling and 3Rs

Objectives	Activities	Period of Execution		
		5 years	10 years	15 years
Expand the entire municipality 3RS program and control excess waste.	Build collection centers.	50 %	75 %	100%
	Socialize with the different communities to implement the 3RS program. Create agreements with different recycling companies to handle recyclable waste.	50 %	75 %	100%
Regularize and sanction companies that use non-recyclable plastics.	Educate local businesses about the use of recyclable materials.	50 %	75 %	100%
	Create ordinance to regulate this situation.	75 %	100%	
Create agreements with the recycling company to handle recyclable waste.	Create institutional arrangements.	50 %	100%	
	Separation at the source.	25%	50%	100%
Responsible	Director of Urban Welfare, Director Environment office, Director Community participation and Manager 3RS Program.			

6 Strategic Final Disposal Plan

6.1 Strategic Plan for Safe Closure of the open-pit Dumping Site

Table 26 Component of Final disposal

Objectives	Activities	Period of Execution		
		5 Years	10 Years	15 Years
Closure of the Dumping Site	The FInal Disposal will only be in the site authorized for these ends. No improvised and illegal dumping sites will be allowed.	50%	75%	100 %
	Random daily inspections of the trucks deposited in the FDS will be carried out to verify the types of incoming waste.	50%	75%	100 %
	Coverage of waste: recommended daily, minimum 3 times / week).	50%	75%	100 %
	Management of leachate (installation of catchment network and construction of lagoon for storage).	50%	75%	100 %
	Management of gases (network of collection and ventilation to the atmosphere).	50%	75%	100 %
	Waterproofing of the base of the dump, according to the conditions of the place.	50%	75%	100 %
	Monitoring of groundwater: 2 times / year	50%	75%	100 %
Responsible	Municipal Mayor, Moca ISWM Plan Team, Environment and Secretary General.			

6.2 Strategic Plan for Public Awareness, Environmental Education and promotion of 3R's

Table 27 Component of Public consensus and Environmental Education

Objectives	Activities	Period of Execution		
		5 years	10 years	15 years
Make people aware of good waste management	Provide information to the public on the integral management of waste (general population, companies, businesses, institutions, etc.).	25%	75%	100%
	Mobilize citizens to be responsible for their waste.	25%	75%	100%
	The municipality will develop a process of public consensus for the installation of infrastructures related to ISWM.	25%	75%	100 %
Responsible	By the Municipal Mayor and executed by the Departments of Environment, Urban Welfare, Education, Press and Community Participation, under the coordination of the Secretary General.			

6.3 Strategic Plan Financial Management

The municipality must take the necessary steps to increase its income and decrease its operating costs.

Table 28 Strategic Plan of Financial Management

Objectives	Activities	Period of Execution		
		5 years	10 years	15 years
Obtaining Resources for Dumping Site Remediation	Execution of the dumping site remediation plan	100%		
Financial planning	Calculation of the cost of the measures (construction costs, maintenance)	100%		
	Determine cost responsibility.	100 %		
Improve the distribution of the budget in the collection of waste	Increase the percentage allocated to municipal services	40%	70%	100%
Improve collection service	Implement efficient collection measures.	25%	70%	100%
	Efficiently collect waste to reduce costs.	50%	100%	
Responsible	Moca Solid waste project team jointly with the Ministry of Environment, JICA and departments in charge of the financial area.			

Below are general activities:

6.4 Evaluation, Monitoring and Monitoring Plan

The evaluation, monitoring and monitoring will be carried out by the Moca Solid Waste Project Team in conjunction with the Ministry of the Environment..

Table 29 Activities Component of Monitoring and Financial Management

Objectives	Activities	Period of Execution		
		5 years	10 years	15 years
Maintain project activities on schedule	Carry out constant checks to verify that the implementation proceeds as planned	50 %	75%	100%
Measure the progress of the plan Identify incidents and find solutions	Confirm that all proposed changes to the project (scope, budget, schedule, quality, procurement, monitoring and evaluation, transition, etc.) are evaluated and recorded, and that appropriate actions are taken.	50%	75%	100 %
	Identify and actively manage project risks that can deplete their ability to achieve results so that the final population benefits from the project.	50 %	75%	100 %
Responsible	Solid waste project team Moca in conjunction with the Ministry of Environment and JICA.			

Annex 1 shows the breakdown of activities by component.

7 CONCLUSIONS

The Integrated Management of Solid Waste, is based on the Sustainable Development of the municipalities, has as main objective the reduction of the waste sent to final disposal. This results in the preservation of human health and the improvement of the quality of life of the population, as well as the care of the environment and the conservation of natural resources.

Currently the municipal administration does not have the economic, human and material resources to comply with the integral management of waste.

The municipality generates too much waste and it is necessary to count on methods that minimize the generation of these, besides the cost, for the small capacity of land of the municipal Dumping Site and the difficulty to find a new place.

This ISWM Plan seeks to design and implement a policy of Integral Management of Solid Waste in order to ensure the care and preservation of the environment, manage equipment and technical inputs necessary to increase the quality of the cleaning services (collection and sweeping), To promote the recovery of recyclable materials, to promote the use of waste for both recycling and energy transformation and to guarantee an adequate final disposal, treatment of leachate. In addition to implementing the separation of hazardous and special waste, to minimize the impacts of solid waste on the environment and the health of the population.