



Municipal City Hall of Azua

Azua de Compostela Province, R.D.



Integrated Solid Waste Management Plan (ISWM) for the municipality of Azua, Period (2017-2031)

MAY 2017

ABBREVIATIONS

FOCIMIRS	Project for the Strengthening of Institutional Capacity in Solid Waste Management
JICA	Japan International Cooperation Agency
LMD	Dominican Municipal League
ISWM	Integrated Management of Solid Waste
MSWM	Handling of Municipal Solid Waste
ONE	National Bureau of Statistics
NGOs	Non-Governmental Organizations
PAHO	Pan American Health Organization
DSW	Domiciliary Solid Waste
MSW	Municipal Solid Waste
USW	Urban Solid Waste
FDS	Final Disposal Site

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PRESENTATION

The proper management of solid waste benefits health, the environment and the economy; while improving the quality of life of communities, especially in urban areas.

1 Diagnosis of the current situation of the SWM

The province of Azua is located in the south region, specifically in the southwest of the country, at 82 meters above sea level. Its territory occupies 2,531.77 km². It is one of the provinces of greater extension, occupying the fourth place in terms of surface, with 5.6% of the national territory. It limits to the northwest with San Juan, the west with Bahoruco, the southwest with Barahona, the south with the Caribbean Sea, the northeast with La Vega, the east with San José de Ocoa and the south-east with Peravia. It is located in the El Valle administrative region. The province has 10 municipalities and 22 municipal districts.

The main municipality is Azua de Compostela, located about 110 km west of the capital, which is a small urban and commercial center on the southern coast of the Dominican Republic. It has an area of 416.3 km² and has 8 Municipal Districts: Barreras, Barro Arriba, Clavellina, Doña Emma Balaguer, Las Barías-La Estancia, Las Lomas, Los Jovillos and Puerto Viejo. It limits to the North with the Hill of Resolí; To the South, with the Cañada de la Vaca; To the East, with Parcel 664-B and to the West, with the river Las Yayitas.

1.1 Socio-economic conditions

1.1.1 Population

According to the 2010 census, the Municipality of Azua, including its municipal districts, has a population of 91,345 inhabitants, of which 81,332 are in the urban area (89%) and 10,013 in the rural area (11%). The main municipality has a population of 59,319 inhabitants. The female sex predominates with 29,908 (50.42%), while the male sex completes the remaining 49.58% (29,411 inhabitants). (See Table No. 01). The population to 2016 is estimated at 60,460 inhabitants, using the rate of growth (0.316%) indicated by said census.

Municipality and Municipal Districts Azua

Table 1 Population of the Municipality by Sex by Municipal District, year 2010.

Municipality and Municipal District	Men	Women	Total
Azua	29,411	29,908	59,319
Barrio Arriba (D.M)	2,781	2,481	5,262
Las Barías-la estancia (D.M)	3,492	3,390	6,882
Los Jovillos (D.M)	3,154	2,808	5,962
Puerto Viejo (D.M)	1,232	962	2,194
Barreras (D.M)	1,247	1,117	2,364

Municipality and Municipal District	Men	Women	Total
Doña Emma Balaguer Viuda Vallejo (D.M)	1,471	1,288	2,759
Clavellina (D.M)	1,424	1,248	2,672
Las Lomas (D.M)	2,068	1,863	3,931
Total	46,280	45,065	91,345

Source: National Census of Population and Housing, 2010

As for the socio-economic level, there are three quintiles (low, medium, high) in the Municipality of Azua, according to their level of income, as defined by the Central Bank, as shown in Table No. 2.

Table 2 Income Range by Economic Group

Quintile	Income
Quintile 2. Low	Income RD\$ 9,061.00/month
Quintile 4. Medium	Income RD\$ 19,440.00/month
Quintile 5. Medium High-High	Income RD\$ 51,507.00/month

Reference exchange rate: RD \$ 44.5 = US \$ 1.00

Source: Banco Central (Central Bank D.R.)

1.1.2 Economy

The Economic Power in the Province of Azua de Compostela has its manifestations in agricultural, industrial, mining, tourist, financial, fishing and aquaculture activities. 27.3% of the total area of the municipality of Azua is exploited agriculturally (Leonor Asilis, 2005).

1.1.3 Agriculture

Agriculture is the predominant economic activity in Azua, standing out the cultivation of the tomato. Another item that is having a lot of success is organic banana. In addition, in the area of the plain in most of the surface is planted onion, pigeon peas, sorghum, banana, milky, conventional banana and melon. To a lesser extent, peanuts, cassava, onions, aubergines and chilli.

The main river of the province is Yaque Del Sur, whose waters are used to irrigate the arid Llano de Azua. There are other rivers, such as the River Vía, which passes through the city of Azua and the Jura River that passes through the Municipality of Peralta and which is the mightiest of the plains of Azua.

In the province there are 200,000 square meters of greenhouses for the coffee

industries and the production of tomato paste. The province has 260,000 tasks with productive capacity, but only 50% is used, because the rest is flooded by problems of salinization. (Listin Diario, September 15, 2016, page 8A).



Photo 1 Some of the main agricultural products in Azua

As far as land tenure is concerned, the majority of the peasants work under a minifundio regime, so the technology used in agricultural work is very primitive and does not go beyond manual plowing, oxen, ax and machete. This population group lives in a subsistence economy. In contrast, most of the area of the municipality is concentrated in medium-sized properties, in which combined technology is used, predominantly mechanization. Large properties, with over 800 tasks are in the hands of a few large producers.

1.1.4 Cattle raising

The province of Azua is a producer of cattle in its lower parts and in the foothills of its mountains, standing out the milk production. This production is supported by the Ysura Project, which provides milk from this area to schools in the Southern Region for school breakfast.

1.1.5 Fishing

Although Azua has several shrimp farming projects that have made it known with an environment favorable to aquaculture, in general it can be said that the fishing activity is artisanal, which merits being industrialized for an optimization in the Production and economic growth of those engaged in this activity.

Twenty-one years ago, with the support of the Taiwanese government, the project "Camarones Marinos" (Marine Shrimps) began in Azua, which remains today. It is located on El Caney beach and its production is export oriented. Also, there is the EMPA Project, led by the "New York Bodegueros". This produces tilapia and freshwater carp, also for export purposes.

1.1.6 Mining

Regarding Mining, in Azua metallic deposits are known in the sector and foothills of the Cordillera Central and in the Sierra de Martín García, where the most important concentrations of minerals are.

Despite the opposition of the Chapter Hall of the municipality of Azua, under the criterion that it was intended to extract Marble Rosado, the General Directorate of Mining gave permission in 2014 for the exploitation of limestone in Monte Rio. In other places of the province explores limestone, travertine, rocky debris and sulfate. In the past, explorations of hydrocarbons, fossil coal and potential geothermal sources have been carried out. However, they have not yet determined sufficient economic value to commercially exploit these resources, although studies are still ongoing.



Photo 2 Oil explorations in Azua

In Las Cañitas, located on the southern flank of the Cordillera Central north of Padre Las Casas, there are signs of copper that are not exploited.



Photo 3 Salt Mines in La Vigía

1.1.7 Industry and commerce

At the end of 1999 there were in Azua the agro-enterprises Barceló Industrial, Selecta Agroindustrial and Peravia Industrial.

As for industrial development, the first steps in the industrial branch of the Azuana occurred in the first decades of the twentieth century. At the end of 1999 there were in Azua the agro-enterprises Barceló Industrial, Selecta Agroindustrial and Peravia Industrial (tomato farms). To these are added the two companies exporting organic bananas: SAVID and Horizontes Orgánicos.

The municipality of Azua has been one of the most benefited by the installation of Agroindustrial companies covered by Law 409, an agroindustrial incentive law, which has stimulated the development of the public and private financial sector.

Apart from the companies mentioned, there are a large number of small industrial workshops in the municipality, in the form of small and micro-enterprises, dedicated to the production of goods such as cheese, butter, sweets, ice, ice cream, vinegar and mabi.

The "Chamber of Commerce and Production" currently has an active membership of 560 micro, small and medium traders, farmers and industrialists. (Breakfast of the Daily Listin, September 15, 2016). These include hardware stores, pharmacies, grocery stores, cable companies, appliance stores and travel agencies, among others.

In addition, in the municipality of Azua there are seven (07) Regional Distribution Centers of products of large national companies, which shows the importance of this province in the southern region. These centers are:

- Regional Pausterizador Rica Distribution Center
- Regional Distribution Center of the Dominican National Brewery
- Regional Distribution Center of San Miguel Industries (Kola Real)
- MERCASID Regional Distribution Center
- Santo Domingo Café Regional Distribution Center
- Ideal Coffee Distribution Center (local company)

On the other hand, it is worth noting that in 2014 Azua had four hundred twenty-five (425) stalls.

1.1.8 Tourism

Azua has paradisiacal places where you can exploit both beach and sun tourism, as well as ecotourism and historical tourism; including agro-tourism with tomato crops and organic bananas. However, despite its attractions, it has not developed to tourist activity aimed at attracting foreign visitors unlike other provinces of the Dominican coast.

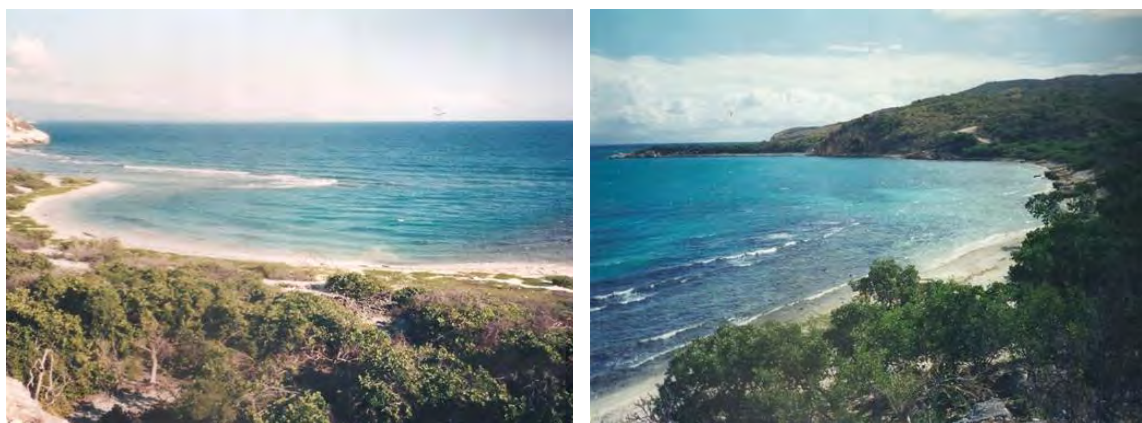


Photo 4 La Uvita and El Guano beaches

Azua has sandy beaches, among which are: Palmar de Ocoa, Chiquita, Caracoles, Estebanía, Monte Rio, Guana, Playa Blanca, La Caobita, Punta de Barco, Caney and Puerto Viejo. Among the attractions of the province are the hot springs of the Sierra Martín García; The spas of the rivers Grande or Del Medio, the spa of La Zurza and The Caves, the Vichy Waterfall, the Loma de los Cacheos and the fishing and diving sites.

1.1.9 Finance

The presence in the municipality of almost all the great banking institutions of the country demonstrates the level of financial movement in the province. The financial sector in the city of Azua has 14 financial institutions in an area of influence that covers the entire province, although its offices are located in the center of the city. Commercial financial institutions are:

- BANCO POPULAR DOMINICANO
- BANCO DE RESERVAS
- BANCO BHD-LEON
- BANCO ADOPEN
- SCOTIA BANK
- BANCO DEL PROGRESO

- COOPERATIVA CENTRAL
- COOFEPPROCA
- ASOCIACIÓN PERAVÍA DE AHORRO Y PRÉSTAMOS
- SOLUCIONES SCOTIA BANK
- BANCA SOLIDARIA
- VISIÓN FUND

While the development and promotion banks are two: Banco ADEMI and Banco Agrícola, respectively.

1.1.10 Public institutions

In the municipality of Azua, there are several regional offices of different public institutions, among them:

- Regional Office of Public Health and Social Assistance
- Regional Directorate of Education
- Regional Passport Office
- Regional Directorate of Internal Taxes
- Regional Land Transit Authority
- Deputy Attorney General for the Electrical System -GASE

1.1.11 International Cooperation Agencies and NGOs

In the municipality of Azua, there are cooperation agencies and / or Non-Governmental Organizations (NGOs), such as:

- • International Plan
- • World Vision
- • United States Agency for International Development (USAID)
- • OXFAM

1.1.12 Basic Services

In the municipality of Azua, 97.16% of the households have access to electricity from the public grid, while 2.84% of homes lack the lighting supply, using other lighting sources such as propane lamp, lamp Kerosene and other media.

On the other hand, 36.83% of the households have access to water inside their house, coming from the aqueduct. 42.21% use the aqueduct as a source outside the home, 3.55% go to a public key and 17.41% take it from other sources, such as rivers, rainwater, among others. (Population and Housing Census 2010).

In another order, 44.12% of households have private toilets. There is a high percentage of shared latrines as a system of disposal of excreta, which indicates that there are still very precarious living conditions, affecting the well-being of household members. (Population and Housing Census 2010).

The proportion of households that receive garbage collection service by the city, according to the 2010 census in the Municipality of Azua is 86.67%.

1.1.13 Education

According to the 2010 census, at the rural level, 36% of women and 38% of men are illiterate. The average schooling for women over 15 years old reaches 6.5 years. The 47.6% reaches some grade of primary, some 31% some secondary school and only 10.7% reaches some degree of university education. (See Table No. 3).

Table 3 Academic Level Reached by the Population of Azua

Población de 5 y más años por sexo, según el nivel de instrucción alcanzado o terminado, año 2010			
Nivel de Instrucción alcanzado	Hombres	Mujeres	Total
Nunca asistió a la escuela	5,896	4,508	10,404
Preprimaria	3,220	3,070	6,290
Primaria o básico	20,040	17,661	37,701
Secundaria o media	9,359	9,644	19,003
Universitaria o superior	3,037	5,564	8,601
Total	41,552	40,447	81,999
Fuente: IX Censo Nacional de Población y Vivienda 2010			

These statistics place this province with a low human development. The vast majority of its residents live with significant material deprivation and limited employment and development opportunities.

The 10.4% of the Economically Active Population (PEA) (over 15 years) of the region did not reach any educational level. (National Census of Population and Housing 2010).

In Azua operates the Regional Education Directorate 03, with four School Districts: 03-01 (Azua), 03-02 (Padre Las Casas), 03-03 (San José de Ocoa) and 03-04 (Baní) are registered (12/27/2016) on the MINERD website (<http://www.minerd.gob.do/Pages/regionales%20listado.aspx>). Public schools

predominate with a total of 167, of which sixty-eight (68) correspond to days of extended classes and ninety-nine (99) to regular days, in addition, there are twenty-seven (27) Private Education Centers. The municipality has 22 public educational centers. (Source: Regional Education 03).

On the other hand, since 1984, the Technological University of the South -UTESUR has been operating in Azua, whose academic offer includes nine (9) degrees at the undergraduate level: law, business administration, bioanalysis, nursing, education in all its mentions, marketing and agronomic engineering. It also offers technical careers in the areas of education, agronomy and secretarial. (MESCyT, 2011).

In addition, it operates the South Regional Institute of Professional Technical Training -INFOTEP.

1.1.14 Employment

The Municipality of Azua, according to the 2010 National Population and Housing Census, has a working-age population of 71,921, of which 36,409 are men and 35,512 are women. It has an unemployment rate of 17.2. (See Table No. 4)

Table 4 Structure of the Labor Market by Sex, Year 2010.

Indicators	Men	Women	Total
Population of working age (PET)	36,409	35,512	71,921
Economically active population (EAP)	17,841	8,894	26,735
Occupied population	16,485	8,043	24,528
Unemployed population	1,356	851	2,207
Population inactive	17,717	25,807	43,524
Global participation rate	49.0	25.0	74.0
Occupancy rate	45.3	22.6	67.9
Unemployment rate	7.6	9.6	17.2

Source: National Population and Housing Census 2010.

1.1.15 Urban and rural areas

The Municipality of Azua presents a morphology and urban structure, with a center and structure of neighborhoods. It has a peripheral geographic position

towards the southwest, linked to the coastal zone. The city is a center of services and of provincial commerce, functioning like a knot of transport, being located to the edge of the Sánchez highway, between the provinces of the west and the east, including the capital. The urban area of the city is composed of 13 sectors, and these in turn are divided into 53 neighborhoods. These people have a low income level.

The rural area is composed of 8 Districts, 14 Sections and 68 Sites. (National Census of Population and Housing, 2010). The inhabitants of the rural area live in their vast majority of the subsistence economy, since they are dedicated to informal agriculture. They have a very low income level.

1.1.16 Land use and protected areas

The Relief of the Municipality of Azua is considered as semi-regular because it is located on a plain surrounded by mountains. It has a considerable extent of plain, but with arid soil that have motivated an agriculture based on channels of risk.

The soils of the municipality of Azua are dry. Most of them are dedicated to agriculture although they have severe natural limiting factors for the crop (aridity, lack of soil development, shallow depth and stoniness). These soils are also used for breeding goats.

The 40.84% of the area of the province is under the National System of Areas protected by the great existing biological diversity. In the province there are a total of 11 protected areas grouped into three management categories that are National Park, Habitat / Species Management Area and Natural Reserve, according to the Department of Environmental Information of the Ministry of Environment and Natural Resources. These areas are¹:

I. National Parks

National Park

1. José del Carmen Ramírez, with an area in the province of 126.16 km²;

2. Sierra Martín García, with a surface area in the province of 81.1 km²;
3. Valle Nuevo, with a surface in the province of 165.08 km²;
4. Francisco Alberto Caamaño Deñó, with an area of 288.8 km², totally in the province; Y
5. Anacaona, with surface of 112.66 km², almost totally in the province.

II. **Habitat / Species Management Area**

Wildlife Refuge

6. Mangroves of Puerto Viejo, with surface of 4.69 km², totally in the province.

III. **Natural reserves**

Forest reserve

7. Arroyo Cano, with an area of 18.71 km²;
8. Barrero, with an area of 192.15 km²;

Hatillo, with an area of 49.64 km²;

Loma The 20, with surface of 50.02 km²; Y

Villarpando, with surface of 79.55 km².

1.2 Meteorological conditions.

The climate of the Municipality of Azua is tropical dry, typical of arid or semi-desert zones. The province of Azua de Compostela is one of the hottest and driest provinces, as the rays of the sun strike directly on the ground due to the little existing vegetation.

On October 28 of this year, on the CEDAF website, <http://www.cedaf.org.do/publicaciones/precipitaciones.pdf>, the following information was reported in relation to precipitation in Azua (municipality). The cumulative average rainfall from 2009 to 2013 (January to November) was 935.2, compared to 728.8 mm in 2013 over the same period. Both surpassed the normal

precipitation of the municipality that is 686.5 mm, being the positive deviation of 36.2% and 6.2%, respectively. The source indicated in the web of CEDAF is: National Office of Meteorology, Deviation, Precipitations.

On the same date, the web <http://es.climate-data.org/location/3000/> (Data collected between 1982 and 2012) the following information was found: The climate is tropical in Azua. In winter there is much less rain than in summer. The climate classification of Köppen-Geiger is Aw (tropical with dry winter). The average annual temperature in Azua is 26.7 ° C. The precipitation is 745 mm per year. The hottest month of the year with an average of 28.2 ° C is August. The coldest month of the year with 24.9 ° C is January. Average temperatures vary throughout the year by 3.3 ° C.

The driest month is January, with 13 mm, while October is the month with the highest rainfall of the year, 138 mm. The difference in precipitation between the driest and the driest months is 125 mm.

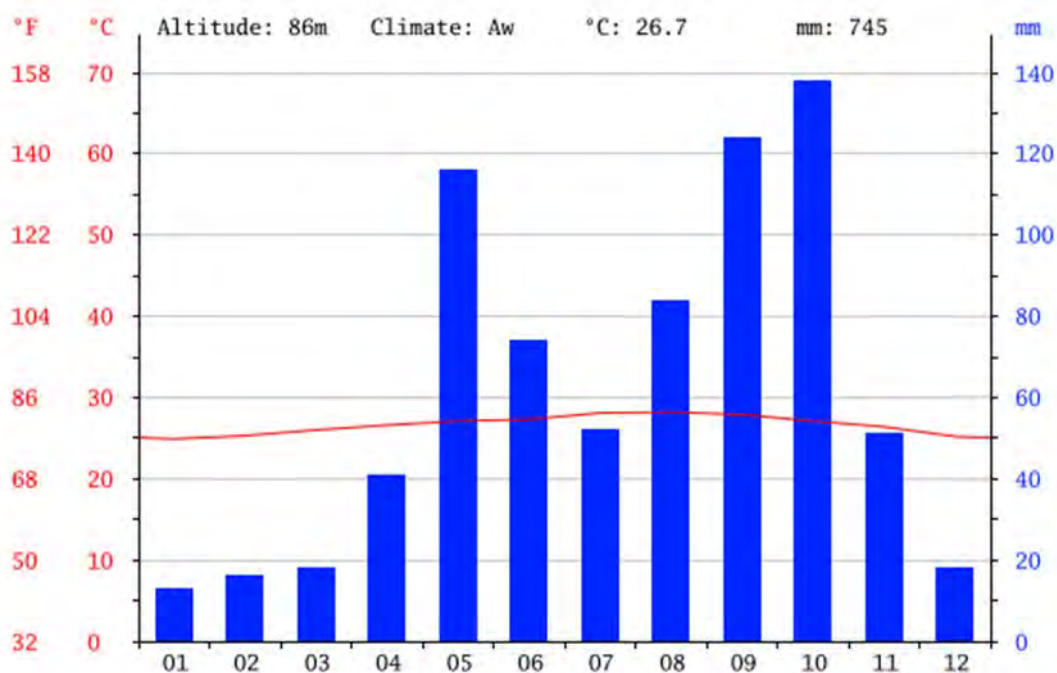


Figure 1 Precipitation and Temperature

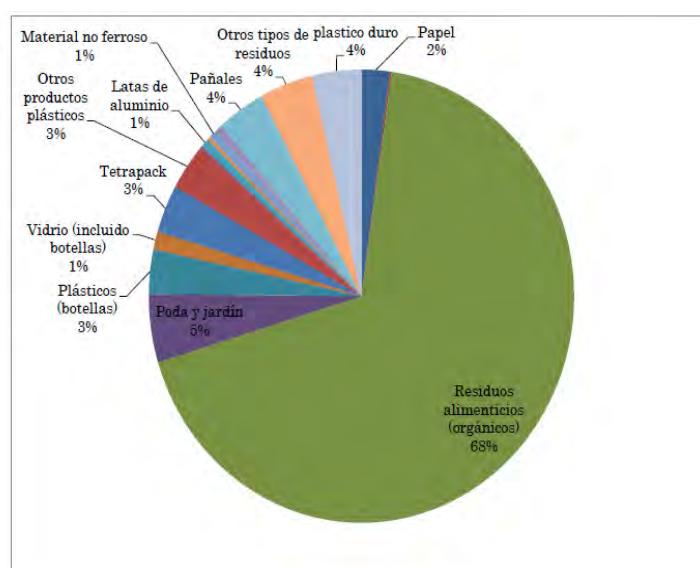
1.3 Current situation of SWM / Current SWM practices

1.3.1 Generation and composition

According to the characterization study (annex) carried out by the FOCIMIRS project team in the municipality of Azua, the average per capita generation of household waste reaches 0.59 kg / person / day. For the different socio-economic quintiles in the municipality, the per capita generation is as follows: 0.50 Kg / inhab / day for the socio-economic quintile 2; 0.57 kg / person / day socioeconomic quintile 4; And 0.71 kg / inhab / day for the socioeconomic quintile 5.

For each socioeconomic quintile the percentage physical composition of household waste generated in the municipality of Azua was determined, according to the study carried out by the FOCIMIRS team, as can be seen in the following graphs.

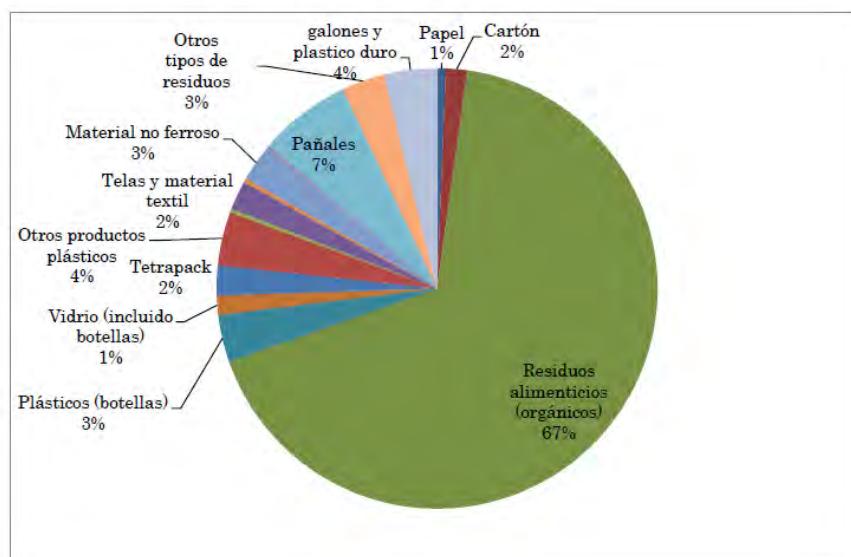
Graphs 3, 4 and 5 show the composition of household waste in each of the studied quintiles: high, medium and low, respectively. In Graph No.2, it can be observed that 68% of the waste generated is organic (of food origin) for the high socioeconomic quintile, 5% are organic from pruning and garden, both constituting 73%. Only 28% is inorganic and of this percentage, 22% is recyclable.



Source: Characterization Study by the FOCIMIRS Team

Figure 2 Physical Composition Percentage of Household Waste in the Municipality of Azua's High Quintile.

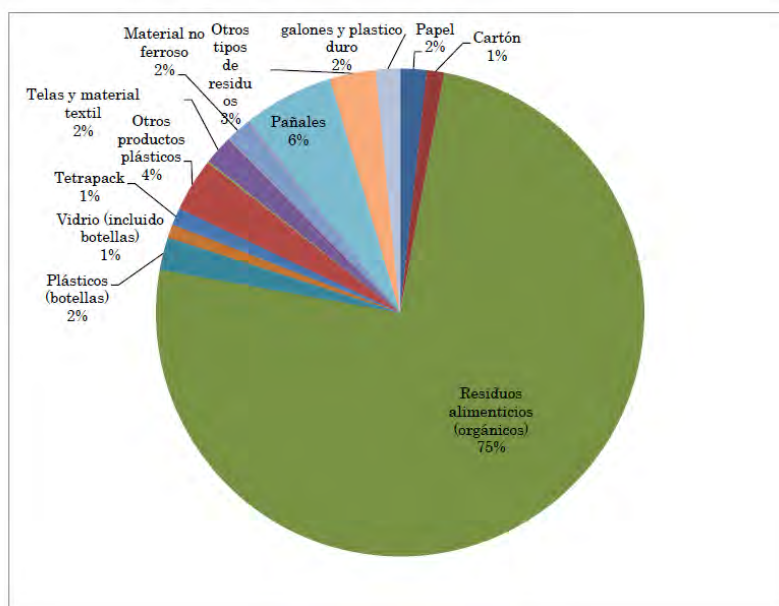
As shown in figure No.03, 67% of household waste generated is organic (of food origin) in the average socioeconomic quintile. The plastic fraction represents 11%, while the paper / board reaches 3%.



Source: Characterization Study by the FOCIMIRS Team

Figure 3 Physical Composition Percentage of Household Waste in the Municipality of Azua Quintile-Middle.

In Figure 4, it is observed that 75% of household waste generated is organic (of food origin) in the low socioeconomic quintile. They are followed by plastics with 8%, disposable diapers with 6% and paper / cardboard with 3%.

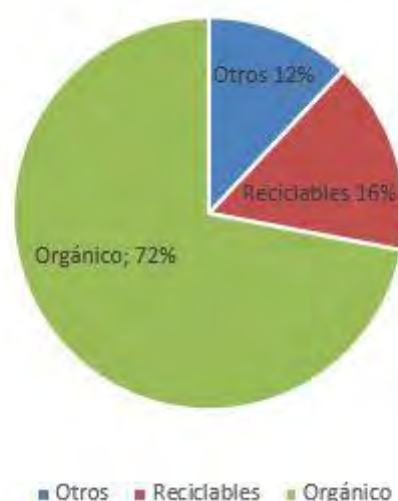


Source: Characterization Study by the FOCIMIRS Team

Figure 4 Physical Position Percentage of Household Waste in the Municipality of Azua Low Quintile

It is important to note that the highest generation for the three socioeconomic quintiles studied corresponds to organic waste (including pruning and gardening), reaching on average almost $\frac{3}{4}$ parts, 72%. The highest proportion of organic is in the lowest quintile (75%), as expected, as people with lower incomes buy fewer processed products. As for the inorganic, the major fraction is plastic in its different types (9.7% on average) in all quintiles. The percentage of disposable diapers (5.7%) is noteworthy, making it the second most important fraction within the inorganic.

Figure 05 presents the composition in three fractions: organic, recyclable and others.



Source: Made by FOCIMIRS project, based on ECCRS data.

Figure 5 Summary composition of the DSW in the municipality of Azua

The study also determined the density of household waste for each quintile studied. The density for the highest quintile reaches 169.59kg / m³, while for the middle and low quintiles of this municipality, the density is 319.9kg / m³ and 241.53kg / m³, respectively. The average density is 243.67 kg / m³.

In the municipality of Azua 58.2 Ton / day are generated, according to the measurements made by the FOCIMIRS team of the municipality during the week corresponding to the end of September beginning of October of 2015. The methodology used was the weighing of each of the trucks, after making their route and before they went to the landfill. Taking this value into account, the municipal per capita generation would reach 0.97 kg / inhabitant / day. This value

is quite similar to that reported by Miguel Ángel Aguilar and Ovispo Familia in June 2014 in a work carried out within the framework of the diploma in "Design, construction and operation of final disposal sites", which indicates that in the municipality of Azua 56.64 tons / day are generated for a municipal generation per capita of 0.94 Kg / inhab / day.

Table 5 Estimation of Non-Domiciliary Generation

Generator	Population	Unit	Unit generation / day Kg	Kg / day	Ton/day	Ton/week	Ton/month	Ton/year
Market	223	Market Stall	1.3	290	0.3	2	9	106
Hospital	105	Beds	1.5	158	0.2	1	5	57
Clinics	35	Beds	1.5	53	0.1	0	2	19
Schools	11,460	Students	0.15	1,719481	4.7	12	52	627
College and Universities	3,205	Students	0.15	481	0.5	3	15	175
Supermarkets	-	Mts2	-	-	-			-
Hotels	-	Bedrooms	-	-	--			-
Others	-	Market Stall	-	-	-			-
Total		Beds		2,700	27	19	82	985

Own elaboration - FOCIMIRS Project

Note: The generation data are estimated based on the data from the Study

Performed in the GSD, given that there is no data for the municipality.

1.3.2 Temporary storage / delivery

The users of the service basically use plastic sheeting, plastic bags, cardboard boxes and plastic buckets for the temporary storage of their waste, which they place on the sidewalks for delivery to the collection service, remaining there until they are removed by the collecting trucks.

The municipality has placed 250 containers for public use, located in different parts of the city, of which 160 are located on major roads and strategic locations such as shopping malls, hospitals, private clinics, student centers, institutions, tourist routes, parks, etc. The rest is distributed in other parts of the population. Each container has the capacity to store approximately half a ton of waste.

A study of the capacity of the public containers for the storage of residues and subsequent retirement by the city council was carried out. In many cases, the delivery of waste by the residents is done properly, that is, in closed bags, but in others is done improperly, since the waste, mostly organic, are released without

order Inside any type of container (open box or bag).



Photo 5 Public containers for temporary storage

1.3.3 Sweeping, collecting and transporting

The collection system is door-to-door and point-to-point. Door to door for household waste and point to point for containers distributed in the city. The loading method is mixed, manual and mechanical, as the containers are collected by pickup trucks, while in the neighborhoods and peripheral locations, the load is done manually. Pickup workers lift containers containing debris and deposit it in small compactor trucks and open trucks.

The waste from the containers is removed once a week, like the rest in the other sectors and are taken to the landfill for final disposal. On the other hand, the containers are washed every week by a washer truck owned by the Town Hall.

As for the routes, there is no designed route system. However, there is a collection route managed by the Cleaners and Transportation managers. The drivers know the city well and come quickly when there is a problem at any point.

Table 6 Weekly SW Collection Program

ITENERARIO DEL AYUNTAMIENTO MUNICIPAL DE AZUA PARA EL RECOGIDO DE LOS RESIDUOS SOLIDOS						
Lunes	Martes	Miercoles	Jueves	Viernes	Sabado	Domingo
La Colonia	Barrio Quisqueya	El Concon	La Bombita	La Placeta	Mercado	Mercado
Pueblo Abajo	Simon Strider	El Caliche	La Cuchilla	Los Restauradores	Parques	Parques
Pajarito	Cartones	La Bombita	La Placeta	Las Marias	Vias Principales	Vias Principales
Alto Las Flores	Los Parceleros	El Prado		Resoli		
los cartones		Buenos Aires				

In the urban area, the frequency of collection is once a week in each sector, during daytime hours, except for the market, where the collection is performed daily (2) times per day, for the amount of waste generate.

According to the Census of 2010, the coverage of the collection service was 86.67%. However after analyzing the situation, it was determined that the coverage is 75%.

Transportation is done directly to the landfill and in the same collector trucks, whether they are compactors or open flaps.

The units used are in good condition, although some of them have more than ten (10) years in operation. The maintenance (change of oil and filters) of these units, is carried out in the same plant of transport; every two (2) months for large trucks and every month for small ones. The washing and greasing is done with a supplier and with the same frequencies (practical maintenance).

Table 7 MAINTENANCE OF COLLECTION EQUIPMENT

EQUIPMENT	Type	MAINTENANCE DESCRIPTION	FREQUENCY OF MAINTENANCE	
TRUCK	BIG TRUCK	Oil change	Once a week	
		Filters, Washing and	Every two months	
		Grease	Once a week	
COMPACTOR	CAMION COMPACTOR			
TRUCK	SMALL TRUCKS	OIL CHANGE	All months	
			CAPACITY	CONSUMPTION
1	2	COMPACTOR	12 TON	50 GAL.
2	2	COMPACTOR	9	40 GAL.
3	1	COMPACTOR	4	30 GAL.
4	2	COMPACTOR	5	30 GAL.
5	8	Big dump truck	2.3 TON	20 GAL.
Other Equipment				
	250	METAL CONTAINERS		
1	1	CONVEYOR WASHING TRUCK		
2	1	GREDAR		
3	1	MECHANICAL SHOVEL		DAMAGED
4	2	TRUCKS		DAMAGED
RELATION OF TRUCKS OF AZUA's CITY HALL				
CODE	FILE	DESCRIPTION	MOTOR	LICENSE PLATE
28	F-30	IVECO WHITE COMPACTOR		
30	F-31	IVECO WHITE COMPACTOR	13669258	
51	FP-42	ISUZU BLUE – dump truck		
50	F-26	ISUZU VERDE - dump truck		
47	FP-36	HINO GREEN COMPACTOR	7721877	
46	FP-40	BLUE FUSION- dump truck		
29	FP-39	DAIHATSU AZUL - dump truck		

15	F-29	mitsubishi GREEN-COMPACTOR		
1845739	F-68	DAIHATSU BLANCO- Dump Truck	500315	
	F-44		1180080952	
	F-45	DAIHATSU – Dump Truck	80094	
	F-43	MACK -COMPACTOR		
	F-101			
	F-33		129272	
7	F-46	ISUZU- COMPACTOR	2325	

STREET SWEEPING

The streets are swept in the city center daily, occupying a journey of six (6) kilometers, including parks March 19, Duarte and SAVICA. Including Sundays.

1.3.4 Recovery and recycling

As in the rest of the country, in the municipality of Azua the recovery of recyclable materials is not a formal activity. This recovery takes place in the municipal landfill, where there are divers who are dedicated to the separation and gathering of some materials, such as plastics, cardboard, glass, metals (iron, aluminum, copper, etc.) and others. These materials are sold to informal buyers who go to the landfill to make the purchase of such recyclable materials. They recover between 2.14 - 5.74% of the total waste generated in said municipality (Study conducted by the Technical Team of FOCIMIRS Azua). In addition, there are street divers who also, informally, recover these materials.

In the municipality of Azua, there is currently no intermediate treatment of these recyclable materials, but they are sold for further processing in the country or for export.



Photo 6 Recovery of materials in the Azua dumping site for later sale.

1.3.5 Final Disposal

The final disposal is made in the open air at the site called "San Francisco site", about 6.3 km from Azua on the Azua-Bani road, behind the ground where ABC Company formerly operated.

In 2004 the city council acquired 500 tasks in that place. However, when the demarcation took place in February 2016, it was determined that these tasks are located in the mountainous part and only 4 tasks in the flat part, reason why almost all the lands acquired at that time, are not apt to The dumping activity, which is mainly carried out on private land occupying an area of 95,406.46m². Bordering the private part, there are plains communal lands with an extension of 100,810.95 m², which have been requested for adjudication to the municipal council.



Photo 7 Entrance to Azua's Dumping Site

In addition, from the specific place of discharge, the entire access road to the FDS is impacted by the uncontrolled disposal of solid waste, as can be seen in the photo.



Photo 8 Azua municipal Dumping Site

In the landfill is frequent burning by divers, which causes great smoke, which is dragged by the wind affecting the nearest populations. This situation is a real challenge for the mayor. In the rainy season, waste strewn by runoff waters reaches Tortuguero beach, according to information provided by city hall staff.



Photo 9 Burning of waste at the Azua's dumping site

The "Standard for environmental management of solid non-hazardous waste" establishes requirements for the installation of Final Disposal Sites. In this sense,

the coordinates of the land where the landfill is currently located were inserted in different maps, in order to verify their compliance.

From the administrative point of view, the landfill occupies land belonging to Las Lomas (DM of Azua de Compostela) and to the municipality of Estebanía, as can be seen in the following map.



Figure 6 Location of the dumping site in the administrative-political map

In relation to the productive capacity of the soil, the land is in soils classes VII and VIII.

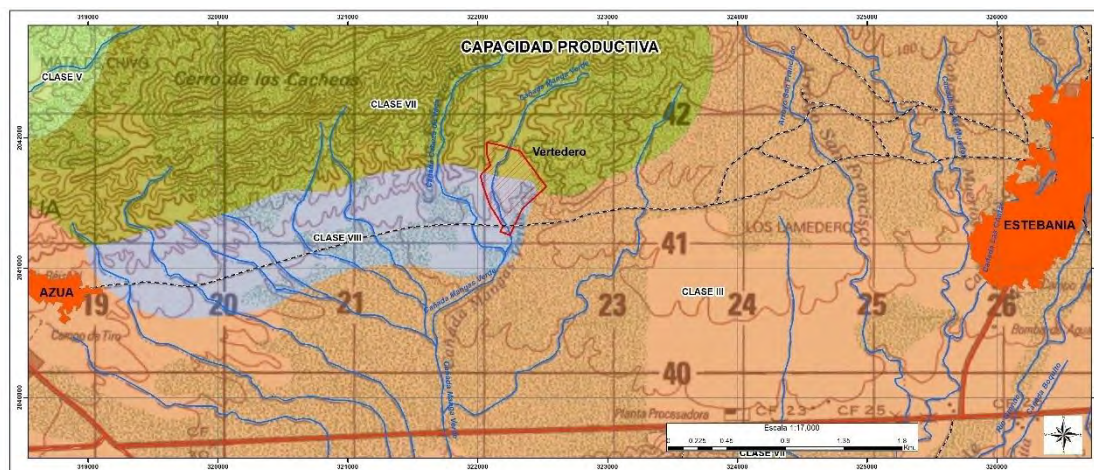


Figure 7 Location of the dumping site in the productive capacity map

As far as human settlement distances and water intake wells are concerned, the landfill is located at greater distances than those established in the standard, 1.5 km and 100 meters, respectively. The landfill is more than 2 kilometers from the nearest towns. The nearest well is about 3 km away (Aguilar).

As for the use and coverage of the soil, the land has, in great majority, with little vegetation.

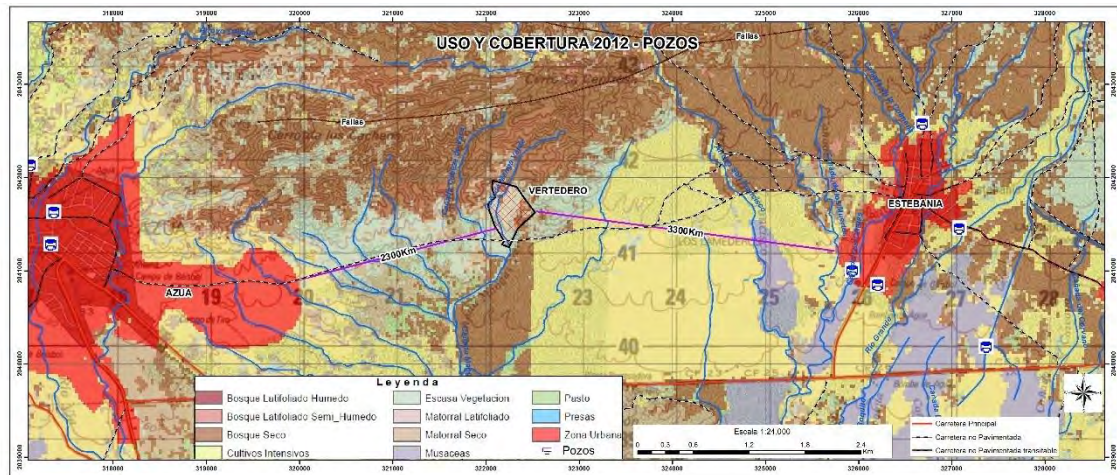


Figure 8 Location of the dumping site in the use and coverage of soil map

In this map you can also see that the green Manga glacier passes over the terrain. Nevertheless, this one does not present continuous flow for many years, according to information of the personnel of city council of Azua. On the other hand, to the west, is the gully Cabeza de vaca, which also has no continuous flow. The standard establishes a distance of 1 km of surface water bodies with continuous flow.

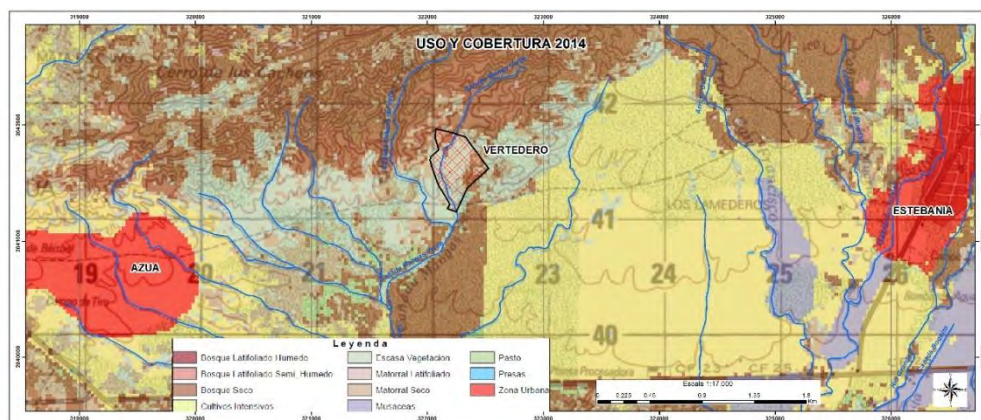


Figure 9 Map 4

As for the water table, an INDRHI certification (annex) certifies that the water table in the area is below the existing wells, located approximately 220 feet deep.

As for the existence of cover material, near the landfill there is a mine of caliche

extraction, as can be seen in the following photo.



Courtesy of Miguel Ángel Aguilar

Photo 10 Caliche Mine

1.3.6 Current waste flow

Of the 58.2 tons generated, 38.4 would correspond to the household generation, according to the characterization study carried out in April 2015. No segregation is carried out at the source.

According to the census of 2010, the coverage of the collection service was 86.67%. Taking this data from the census, 50.44 tons would be collected and 7.75 would go to other destinations (uncultivated lands, thrown into canyons / rivers / streams, burned). It is worth mentioning that in discussion with the responsible for transportation, it was considered that at present this percentage would be estimated at 75%, due mainly to the emergence of new neighborhoods. In that case, the collected waste would amount to 43.65 tons / day. The remaining 25% (14.55 ton / day) is illegally deposited in improvised dumps, or other destination.

Table 8 shows the current flow of municipal waste generated, considering the % of collection assigned by the 2010 census.

Table 8 Current Waste Flow Municipality Azua

Generación	Segregación	Recolección	Transporte	Tratamiento	Transporte	Disposición final
58.2 ton/día 100%		50.052 ton/día 86%		50.052 ton/día 86%		50.052 ton/día 86%
		Caneles Municipales, Puerta a puerta y Contenedores Quien? Ayuntamiento				Vertedero Como? A cielo abierto Quien? Ayuntamiento
						8.148 botaderos

1.3.7 Environmental education and citizen participation

There are no permanent public awareness and awareness programs related to solid waste management. However, at specific times campaigns have been carried out. This is the case of the campaigns promoted by the central government, and supported by the city council, for the elimination of vectors transmitting diseases (dengue, chikungunya, zika, among others), such as the *Aedes aegyptus* mosquito) or for the prevention of Cholera, leptospirosis, etc.

In terms of citizen participation, the population, in general terms, complies with the provisions issued by the municipal authority, as to the days and hours of collection of the various existing routes. On the other hand, there are no formal mechanisms for participation in the SWM.

1.3.8 Organization of the municipality for the SWM

As can be seen below in the general organization chart of the city hall, there is the "Department of Cleaning and Ornament", directly dependent on the mayor, whose characteristics and functions are described in the Organization and Functions Manual, approved by the Ministry of Public Administration in March 2015.

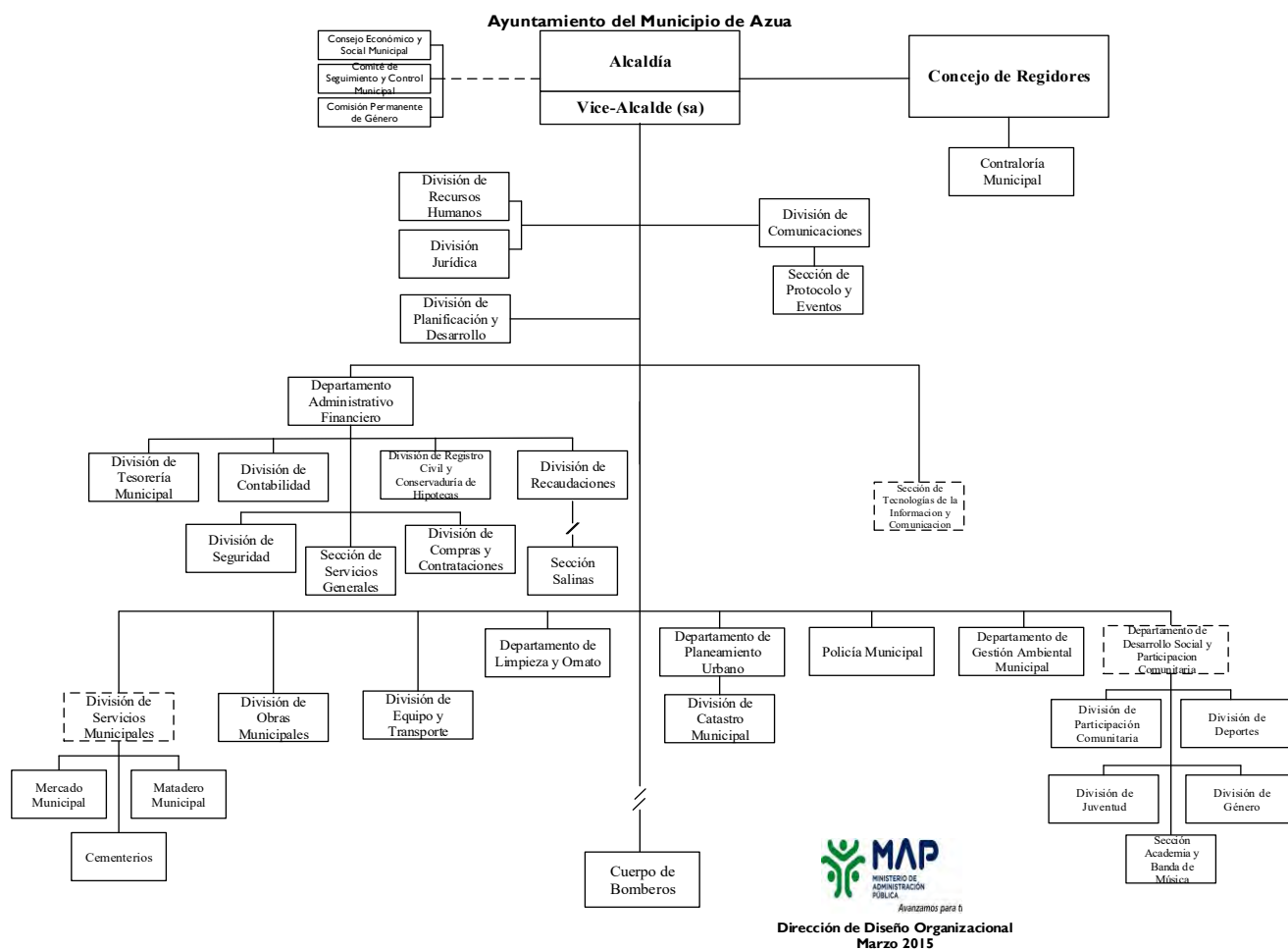


Figure 10 Organization chart in Azua municipality

Unit title	: Department of Cleaning and Ornament
Nature of the unit	: Substantive or Operative
Organic Structure	: The staff that integrates it
Dependency Relationship	: City Hall
Coordination Relationship	: Financial Administrative Department
	: Department of Municipal Environmental Management
	: Division of Equipment and Transportation

Organization chart:**Figure 11 Organization chart of cleansing****General objective:**

Provides and manages the maintenance and cleaning services of the public thoroughfare, as well as parks, cemeteries and the municipal market, in compliance with the attributions and competences of the Azua Municipal Council.

Principal functions:

- Plan, organize and coordinate the collection of solid waste and street cleaning, transport the waste and subject it to the corresponding treatment.
- Plan and schedule, in coordination with the Equipment and Transportation Division, the use of heavy equipment and machinery assigned to the cleaning work, in order to ensure the efficiency of the service.
- Organize and coordinate the cleaning of parks, monuments, cemeteries and other public places.
- Coordinate with the Department of Municipal Environmental Management, the cleaning of streets, sidewalks and lots.
- Eliminate landfills and other illegal areas from solid deposits and apply sanctions and fines to people who violate sanitary provisions.
- Coordinate with the Finance Department, feasibility studies related to the collection of fees for cleaning services.
- Organize, coordinate and supervise the pruning of trees and plants in public places every two months.

Program and direct the activities related to the afforestation of the streets, parks, and gardens of the municipality of Azua.

- Guarantee the order, cleaning and delivery in the parks.
- Perform any related or complementary function assigned to it by its immediate superior.

Structure of Positions:

- In charge of Cleaning and Decoration Department

No specific job description is made.

Source: MUNICIPALITY COUNCIL OF AZUA - Organization and Function Manual

In addition to the manager, the department has four other (4) administrative employees, whose positions are:

- Vice-manager (1)
- Person in charge of the list (1), kind of supervisor of the people who are in the street (brigades of gathering and sweeping)
- Secretary (1)
- Housekeeper (1)

The human resources department provided a list of personnel assigned to solid waste management (annex) to December 2015. A total of 179 people are assigned to the cleaning and street sweeping service. The following table groups the list provided by the assigned roles.

Table 9 Employees assigned to SWM

Role	Equipment or activity	Amount
Drivers	Water truck	01
	Mini bus	01
	Bobcat	01
	Transportation	11
	Greddar	01
	Truck washing	01
Drivers	-	07
	Del Sistema OMB	03
Total amount of drivers		26
Driver's assistants	Mini bus	02
	Greddar	01
	Roller	01
	Retro shovel	01
	Truck washing	01
Total amount of driver's assistants		06
Operator	Retro shovel	01
Total amount of operators		01
Supervisors	Neighborhoods	02

Role	Equipment or activity	Amount
	From park	03
	Gully	03
	Cleaning	03
		05
Total supervisors		16
Sweepers		28
Workers	By Truck	16
	Cleaning	16
	From Park	01
	From Brigade	01
Workers	-	10
Total workers		44
Ornament Supervisor		01
Ornament vice supervisor		01
Ornament inspector		03
Cleaning inspector		04
Inspector		03
Total Inspectors		10
Truck cleaners		02
Total truck cleaners		02
Mechanical Engineer		01
Mechanic		02
Mechanical Engineer		03
Master of Mechanics		02
Tires personnel		02
Total tires personnel		02
Electromechanical		01
Welder Master		01
Assistant Welder		01
Electrical technician		01
Fuel Manager		01
Concierge		24
Secretary		02
Total Secretary		02
Guardian		02
Person in charge of the list		01
Total SW employees		179

The supervisory staff consists of 26 supervisors and inspectors, which means that there is one supervisor for every 7 workers.

It is worth noting that some 29 employees are assigned to the payroll of solid waste, however, their functions do not correspond to any collection / transportation activity or final disposal thereof. Such is the case of the drivers (2) of the water truck and bobcat, the driver and assistants of the minibus (3) and the 24 custodians.

1.3.9 Financial management of the service

The accounting department provided the expense report for the management of solid waste MRS in the period January-December 2015.

Table 10 SWM expense report - January to December 2015

Payroll Management and Repair of Motorized Units (TRANSPORTATION)	
Fixed salaries	3.887.999,91
Annual salary no.13	319.056,61
Contributions to health insurance	245.736,47
Contributions to pension insurance	246.077,80
Contributions to occupational risk insurance	40.437,26
SUB-TOTAL GENERAL	4.739.308,05
List of Ornaments and Sanitation of Streets, Squares and Parks	
Fixed salaries	1.175.358,05
Annual salary no.13	160.815,00
Contributions to health insurance	75.990,62
Contributions to pension insurance	69.856,90
Contributions to occupational risk insurance	12.679,40
SUB-TOTAL GENERAL	1.494.699,97
Payroll for Solid Waste Management	
Fixed salaries	6.301.337,79
Day laborers	1.937.552,51
Annual salary no.13	650.110,23
Contributions to health insurance	311.479,29
Contributions to pension insurance	321.312,54
Contributions to occupational risk insurance	48.214,80
SUB-TOTAL GENERAL	9.570.007,16
TOTAL GENERAL	15.804.015,18

Miscellaneous Expenses Report - Solid Waste Management

Payroll Management and Repair of Motorized Units (TRANSPORTATION)	
Real estate insurance	380.117,03
Tires and tires	1.818.836,49

Automobiles and trucks	1.491.992,68
Tools and machine tools	2.841.386,88
Fuels and lubricants	8.500.000,00
SUB-TOTAL GENERAL	15.032.333,08
GRAND TOTAL	15.032.333,08
TOTAL COSTS of SWM	30.836.348,26

エラー! リンクが正しくありません。 Source: Department of accounting of the municipality of Azua.

The "solid waste management" list refers to personnel assigned to collection, transportation and final disposal, including drivers and assistants. The "transportation payroll" refers to personnel working in the workshop / warehouse of heavy equipment, such as mechanics, guards, among others. On the other hand, the items "tires and tires, automobiles and trucks and tools and machine tools" refer to the repairs and maintenance of the collection equipment.

Based on the information contained in these tables, the following was elaborated, where these costs are presented under the items traditionally used to report costs associated with the SWM.

Table 11 SWM financial sustainability

Costs and Income in solid waste management	
Azua de Compostela	
Period: January - December 2015	
Budget items	AMOUNT RD\$
Personal	15.804.015,18
Equipment and Transportation (Transportation)	4.739.308,05
Sanitation of streets, squares and parks	1.494.699,97
Waste management	9.570.007,16
Fuels and lubricants	8.500.000,00
Repair and Maintenance	6.152.216,05
Tires and tires	1.818.836,49
Automobiles and trucks	1.491.992,68
Tools and machine tools	2.841.386,88
Real estate insurance	380.117,03
Total cost	30.836.348,26
Proceeds from the collection and transportation service	
Payment of businesses by the collection service	594.690,00
Total revenue	594.690,00

% Collections in relation to the cost	1,93
Total municipal budget	104.843.910,90
% SWM of total municipal budget	29,41
Estimated tons 2015	21.170,00
Cost of MRS / ton (RD \$)	1.456,61
Cost of MRS / ton (US \$)	31,67
Cost of repair and maintenance	6.152.216,05
Cost of repair and maintenance / ton (RD \$)	290,61
Cost of repair and maintenance / ton (US \$)	6,32

Own elaboration. Source: Department of accounting of the municipality of Azua.

The total cost of the SWM is RD \$ 30, 836,348.26 and the income only RD \$ 594,690.00. These data show the financial unsustainability of MRS, which is practically subsidized almost entirely with municipal funds, since revenues cover less than 2% of costs. The amount collected (RD \$ 594,690.00) is equivalent to 59.1% of the amount that should be collected (RD \$ 1,005,480.00), according to the list of taxpayers provided by the city council (Annex No. xx). Even if it were charged 100%, only 3.26% of the cost of the service would be covered. It is worth noting that the charge is only made to stores, since there is no billing for the addresses.

On the other hand, the cost for the provision of the service represents almost the maximum amount allowed by law (31%) to municipal services, 29.41%; consequently there is little that the municipality can allocate to other services such as cemeteries, markets, sidewalks, among others. In another order, the personnel costs represent 51.25% of the total cost of the service, more than those incurred in the costs related to the use and repair / maintenance of equipment, which includes 47.52%

1.3.10 Social and environmental aspects

The dumping site, which, as indicated above, is located on land that was later declared as part of the National System of Protected Areas, specifically the Caamaño National Park (Decree 531-09) and the Hatillo Forest Reserve (Law 202-04).

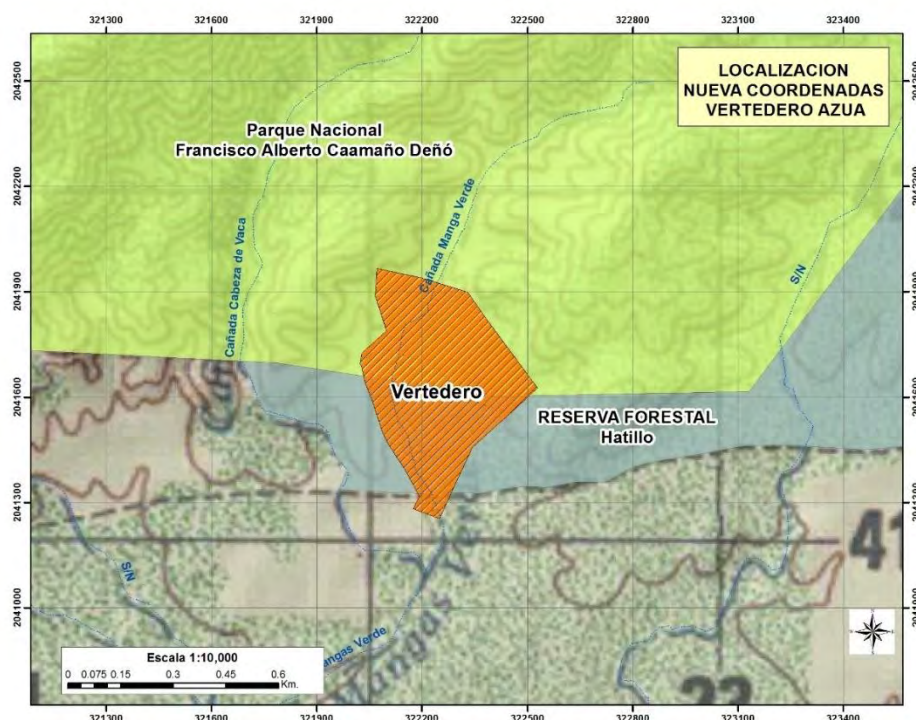


Figure 12 Location of Azua's Dumping Site

As for the social, as indicated above, in the FDS there are divers who perform the recovery of materials without any personal protection, under extreme unsanitary conditions. On the other hand, the divers themselves light the mass of waste to facilitate the recovery of the metals present.

1.3.11 Legal base in force

All the municipalities of the country are governed by Law 176-07 "Of the municipalities and the national district", in which they are established as exclusive competence of the municipalities, among others:

- To regulate and manage the protection of public hygiene and sanitation to guarantee environmental sanitation (Article 19 (f)).
- "Public cleaning and decoration services, collection, treatment and final disposal of solid waste". (Article 19 (m)).

For its part, Law 64-00 on Environment and Natural Resources, article 106 ratifies the competence of municipalities for the collection, final disposal and treatment of solid waste. The "Standard for environmental management of non-hazardous solid waste" establishes the conditions and requirements for each of the stages of waste management.

In 2014, MARENA issued by resolution No. 19-2014 the "Policy for the integral management of municipal solid waste".

At the municipal level, there is no specific ordinance regulating the management of SW. However, since 2014 there has been Ordinance No. 08-14 that approves an Ante-Project for Modification and Adjustment of the Tax Framework of the City of Azua. It establishes:

FIRST: DECLARE how the effect declares of urgency the modification and adaptation of the tax framework of this Municipality, in order to establish taxes, rate, rights and an efficient system of management of billing and collection of the same, to be able to fulfill fully, to Favor of the citizens with the powers and obligations that the constitution and the laws expressly place in charge of this chapter.

SECOND: AUTHORIZE the mayor to carry out a bidding process and public contracting, for the management of billing and collection of taxes, fees, services and rights of this building, or take the appropriate measure by Administration.

In spite of being approved by the council of regidores, at the moment it is not charged to the addresses. The City of Azua can make use of this existing tool, to start charging for the service of collection and transportation of solid waste.

The costs established in Ordinance 08-14 are those in Table 12 below.

Table 12 Cost for the Solid Waste Collection Service

Service	Cost RD \$.
Residential	RD \$ 200.00
Commercial	RD \$ 200.00 to RD \$ 250.00
Using Ramps	RD \$ 200.00 X Annual ML
Association of Buses, Minibuses and Taxis by Annual Circulation Permit	RD \$ 1,500.00
Association of Buses, Minibuses and Taxis by Permit of Monthly Circulation	RD \$ 60.00 to RD \$ 150.00, depending on the number of units.

1.3.12 Monitoring and follow-up

Although there is a large number of supervisors, as indicated above, there is no

formal program for monitoring and control of service provision. There is also no system for recording complaints from users of the service.

In the ornamentation and cleaning department there is the figure of the "listero (Person in charge of the list)", a kind of supervisor who verifies that the street staff is doing the assigned tasks.

2 Assessment of the current situation and identification of critical problems

2.1 Identification and analysis of problems in the SWM

To identify and analyze the current problems in the SWM, a workshop was held on July 19, 2015 entitled "Analysis of the problem of RS and possible solutions", with the participation of a total of xx representatives of institutions and key actors (Annex xx), such as the MSP, the MINERD, neighborhood meetings, mothers' clubs, churches, entrepreneurs, commercial sector, etc.



Photo 11 Workshop on Problems of SW and Possible Solutions

The results of this workshop are presented in annex:

Based on the problems raised in the previous workshop, the local team summarized them as follows:

Summary of the workshop "ANALYSIS OF THE PROBLEM AND POSSIBLE SOLUTIONS IN THE MANAGEMENT OF SOLID WASTE IN THE MUNICIPALITY OF AZUA"

Participants: MARENA Provincial Administration, Azua Municipal Council, FOCIMIRS, Representatives of Neighbors Boards, Churches, Businessmen, Public Health, Education and other institutions

Azua de Compostela July 9, 2015

Table 13 Analysis of the problem

Problems	Solutions
1. Good garbage collection	1. That the city council schedule the collection of the garbage 2. Train staff to avoid overfilling of trucks 3. Hire private companies for the garbage collection
2. Ineficiencia with the transport	1. Use the right trucks, compactors 2. Trucks must be in good condition
3. Household trash and landfill	1. Cover the garbage dump 2. Environment and city council should punish those who burn garbage 3. Seek alternatives such as recycling, producing energy, etc., 4. Collect the trash in time to avoid clumps in homes
4. Small awareness of the population	1. Develop an education plan for citizens and workers with a mass awareness campaign
5. Economic incapacity to manage solid waste	1. Look for alternatives with the private sector in order to take advantage of waste 2. Bring government solutions to support
6. Lack of control and lack of a plan in the use of the FDS.	1. Check the entrance and exit of the landfill as well as the hours of operation 2. Manage with the MOPC the access path arrangement 3. Establish the type of landfill we are going to handle
7. There is no policy for the management of solid waste in the province	1. that the MARENA establish, together with the municipalities a policy for this province so that all give the same treatment to solid waste
8. Mismanagement of hospital waste	1. That hospitals and private clinics manage their waste as a public health policy

3 Prioritization of critical problems and definition of strategic lines

The FOCIMIRS-Azua project team performed the analysis of the problems identified, determining those critical. The result is presented below:

3.1 Critical Issues

- 1- Inefficiency in the system of collection and transport of SW
- 2- High costs of the collection and transport service
- 3- Lack of political will
- 4- Undifferentiated collection of hazardous hospital waste with common waste
- 5- Poor participation of the population in the SWM
- 6- Financial incapacity of the city council for the proper handling of SW
- 7- Contamination in the community by the open pit
- 8- Poor qualification of personnel responsible for SWM

Once the critical problems were identified, they were prioritized.

3.1.1 Priority order of problems

- 1- Contamination by the open landfill
- 2- Financial unsustainability of SWM
- 3- Inefficiency in the collection service
- 4- Poor education and participation of the population facing the SWM
- 5- Undifferentiated collection of hazardous hospital waste with common waste
- 6- Poor political will for the SWM
- 7- Poor training of personnel assigned to the SWM

Based on the strategic lines defined above, a brainstorm was made on possible solutions to the identified critical problems.

Table 14 Possible Solutions to the SWM Critical Problems in Azua

PROBLEMS	MEASURES /ACTIVITIES
1. Contamination by open landfill	Modify for joint controlled dumping site or landfill.
2. Financial incapacity of the municipality for the SWM	1) Reduce costs: <ul style="list-style-type: none"> • Route Efficiency • Define collection stations • Increase the number of public containers • Evaluate the human resources assigned to MRS • Evaluate equipment operation and maintenance costs • Reduce the volume of organic waste going to landfill 2) Increase income <ul style="list-style-type: none"> • Review and update tariffs to retailers. • Expansion of collection coverage to stores • Establish tariffs for service users' households • Establish collection system • Charge for the final disposition to the private users
3. Inefficiency in the collection and transport system	Conduct time and movement studies on routes
	Increase collection frequency
	Assess condition vehicles for collection
4. Poor education and awareness of the population in the face of ISWM	Carry out TV and media campaigns
	Education, training, door-to-door awareness
	Talks to promote 3Rs culture
5. Undifferentiated collection of hospital hazardous waste with common waste.	Develop and execute an ISWMP.
6. Weak political will to improve SWM	Develop and execute an ISWMP.
7. Poor training of personnel responsible for SWM	Evaluate staff competencies and plan Training for the ISWM.

4 Definition of planning conditions

4.1 Framework

1) Horizon of the plan

The period of execution of this plan is fifteen (15) years, divided into three phases:

- First phase: It covers the first five (5) years and is considered as the short term.
- Second phase: It covers from the year six (6) to the year ten (10) and considers the medium term.
- Third phase: It covers the last five (5) years, from the eleventh to the fifteenth year.

The ISWM plan will be reviewed every five years, in order to make the adjustments required to meet the long-term objectives.

2) Target Area

The geographical area of action is the municipality of Azua de Compostela, which is the head of the municipality and capital of the province. In a small urban and commercial center on the south coast of the Dominican Republic.

1. According to the 2010 census, the city is divided into 20 neighborhoods, and these in turn into 12 sub-neighborhoods:
2. The Cartons
3. Simon Striddels
4. La Bombita (Los Solares, Villa Esperanza, Los Lados, Canta la Rana and San Miguel)
5. Villa Esperanza (Cambodia, Restorer, Military and Resolí)
6. City Center
7. Down Town
8. Savíca (Urbanization Framboyán)
9. The Mangos
10. Buenos Aires (Cañada del Concón or Altos del Cacheo)
11. The Spanish Colony
12. Social Improvement
13. Little Bird
14. The Fridge

15. The Border
16. The Prado
17. Alto de las Flores
18. Quisqueya Urbanization (Urbanization Quisqueya II)
19. Juan Pablo Duarte
20. Acapulco
21. The Parceleros

At present, the urban center of the city is made up of 13 sectors, which in turn are divided into 53 neighborhoods. The following is a summary of the sectors and neighborhoods:

Table 15 Sectors of the Municipality of Azua

Urban area		
Sector	Neighborhoods	
Juan Pablo Duarte	Juan Pablo Duarte	
La Cuchilla	Resolí La Granja La Curvita Las marías José Francisco Peña Gómez	
El Prado	El Prado Buenos Aires El Hoyito	
La Bombita	Villa Esperanza Alto de Nin Lalito González Altos de Chavón Camboya Los Acostados	Riviera San Miguel Canta la Rana El Tubito Puerto Rico El Milloncito
Quisqueya	Quisqueya I Quisqueya II	
Simón Striddells	El Manguito Los Multis Simón Striddells	
Los Cartones	Los cartones La Bomba de Agua	
La Colonia Española	La Colonia Española La Frontera El Caliche	Cañada del Concón Mejoramiento Social
Los Parceleros	Los Parceleros	
Pueblo Abajo	Pueblo Abajo Framboyán Libertador	Los Macos Sávica
La Placeta	Los Restauradores El Trompo	El Hoyo La Placeta
Pajarito	Pajarito	
Alto Las Flores	La Nevera Alto las Flores Los Agrónomos	

Elaboración propia – Proyecto FOCIMIRS. Fuente: Ayuntamiento de Azua

3) Target-waste

The solid waste to be covered in this plan are municipal waste (residential, commercial, institutional, small industry) and similar waste from clinics and hospitals (office waste, kitchen waste, etc.). The "Standard for the Integral Management of Non-Hazardous Solid Waste" defines municipal waste as: "solid or semisolid waste from urban activities in general. It may have residential or domestic, commercial, institutional, small industry or sweeping and cleaning streets, markets, public areas and others. Its management is the responsibility of the municipality or other government authority. Synonym of garbage and waste".

4.2 Population projection

Population projection The projection of the population for the next 15 years, that is, from 2015 to 2031, was made by applying the rate of population growth in the period 2000-2010, which according to the ONE was 0.316 (to be confirmed), yielding the following results CONFIRM:

Table 16 General Calculation of the Amount of Household Waste of the Municipality of Azua.

CALCULO GENERAL DE LA CANTIDAD DE RESIDUOS DOMICILIARIOS DEL MUNICIPIO DE AZUA									
AÑO	POBLACION(*)	Generacion	TOTAL DE RESIDUOS				MATERIALES RECUPERABLES (Kg/Mes)		
		Kg/hab/día	Kg/Día	Ton/Sem	Ton/Mes	Ton/Año	Reciclables	Orgánicos	Otros
2010	59,319	0.59							
2011	59,508	0.59							
2012	59,697	0.59							
2013	59,887	0.59							
2014	60,077	0.59							
2015	60,268	0.59	35,558	249	1081	12,979	172,955	778,299	129,716
2016	60,460	0.59	35,671	250	1084	13,020	173,505	780,774	130,129
2017	60,652	0.59	35,785	250	1088	13,061	174,057	783,256	130,543
2018	60,845	0.59	35,899	251	1091	13,103	174,610	785,747	130,958
2019	61,038	0.59	36,013	252	1095	13,145	175,166	788,246	131,374
2020	61,233	0.59	36,127	253	1098	13,186	175,723	790,752	131,792
2021	61,427	0.59	36,242	254	1102	13,228	176,282	793,267	132,211
2022	61,623	0.59	36,357	255	1105	13,270	176,842	795,790	132,632
2023	61,819	0.59	36,473	255	1109	13,313	177,405	798,320	133,053
2024	62,015	0.59	36,589	256	1112	13,355	177,969	800,859	133,476
2025	62,212	0.59	36,705	257	1116	13,397	178,535	803,406	133,901
2026	62,410	0.59	36,822	258	1119	13,440	179,102	805,960	134,327
2027	62,609	0.59	36,939	259	1123	13,483	179,672	808,523	134,754
2028	62,808	0.59	37,057	259	1127	13,526	180,243	811,095	135,182
2029	63,008	0.59	37,174	260	1130	13,569	180,816	813,674	135,612
2030	63,208	0.59	37,293	261	1134	13,612	181,391	816,261	136,044
2031	63,409	0.59	37,411	262	1137	13,655	181,968	818,857	136,476
(*) Poblacion y crecimiento poblacional Censo 2010 pag. 34 y 40									

4.3 Economic projection

The municipality of Azua has a great potential for economic development, considering the different types of natural resources that are in its territory and which were indicated in the diagnosis of the current situation, such as:

Mining sites:

- Salina La Vigía
- The Poza by Manuel Ruiz
- Pink Marble of the Rocky Hill of Tortuguero
- Pink Marble of Lookout Hill
- Reddish Marble of the Loma de la Vigía
- Gray Coral Reefs
- Metallic deposits in the area and foothills of the Cordillera Central and in the Sierra de Martín García, where are the most important mineral concentrations.



Source: Draft of the Municipal Development Plan PMD of the municipality of Azua de Compostela. Environment and Natural Resources. Agron. Miguel Ángel Aguilar. 2012

Photo 12 Mines of pink marble and salt in Loma La Vigía and Peñón de Tortuguero

In the Cañitas there are indications of copper that are not exploited.

Explorations have been made of hydrocarbons, fossil coal and potential geothermal sources. On October 25, 2016, in several newspapers in the country appeared the article entitled "Energy and Mines says six basins have potential oil in DR." The areas with the greatest potential are in the Enriquillo, Azua, San Juan, San José de Ocoa, San Pedro de Macorís and Cibao Oriental basins, where there are faults and structures that could act as traps to retain oil.

In Azua the exploration potential is 13 square kilometers. In the Azua basin it was determined that there are "structural highs that function as storage traps for hydrocarbons". In the past in Azua some wells were dug in search of oil.

In terms of tourist attractions, the municipality of Azua has:

Playas

- 1) Tortuguero
- 2) Poza Rica
- 3) El guano
- 4) Monte río
- 5) Blanca
- 6) El Barco
- 7) Manuel Ruiz
- 8) El muerto
- 9) La Uvita
- 10) Blanca del Caney
- 11) La salina



Source: Draft of the Municipal Development Plan PMD of the municipality of Azua de Compostela. Environment and Natural Resources. Agron. Miguel Ángel Aguilar. 2012.

Photo 13 Playa El Barco, Playa Blanca y Manuel Ruiz

Freshwater lagoons:

- Laguna "Los flamencos", located behind the residential hill of Monte río.
- Laguna "Salao rojizo", located in the upper part of Monte Rio, behind the house of Chito Naut.



Source: Draft of the Municipal Development Plan PMD of the municipality of Azua de Compostela. Environment and Natural Resources. Agron. Miguel Ángel Aguilar. 2012

Photo 14 Laguna Los Flamencos

Spas:

- Hot springs of the Sierra Martín García
- From the Rio Grande
- From the middle river
- De la mura
- The caves
- Waterfall of Vichy
- Loma de las cachas

At the breakfast of the LISTIN DAILY of Thursday, September 15 (pages 8A and 9A), in the LA REPUBLICA section, authorities and personalities of the municipality of Azua indicated that they aspire to the province of Azua "to become a tourist and economic power of the southern region". The President of the Azua Tourist Cluster, José Santana, said that they are focused on developing eco-sustainable tourism, because it is "healthier tourism and the one that generates more income". He also said that it is planned to create a corridor around the beaches. He said that Tortuguero beach lends itself to make a marina that would allow Azua to connect with the entire coast of Barahona and Ocoa.



Source: Draft of the Municipal Development Plan PMD of the municipality of Azua de Compostela. Environment and Natural Resources. Agron. Miguel Ángel Aguilar. 2012

Photo 15 Spas in the municipality of Azua

The senator for the province Rafael Calderón presented a draft of the so-called "Strategic Development Plan 2012 - 2032", which has as a slogan: "Azua: land of the sun that bets on culture, creativity and scientific-technological development." This plan contemplates the "creation of agricultural cooperatives by productive subsectors to improve competitiveness, such as organic and conventional bananas, beekeeping, sea fishing, aquaculture, coffee, fruits and vegetables."

Among the strategic plans of the 2016-2020 government is the tourist development of the southern region. A highway is being built that would communicate the deep south with Bani.

The current authorities are called upon to develop the great potential for sustainable economic development in the province of Azua, as Mr. Santana said: "We have enough potential, we must exploit it." This development will undoubtedly contribute to the progress of its municipality, Azua de Compostela. If the projects proposed by its authorities are carried out, an increase in the generation of waste and significant changes in its composition.

4.4 Projection of the generation

Considering an annual increase in production per capita, the following formula applies the generation:

$$G_{pf} = G_{pa} + (1+r)^n$$

Where:

G_{pf} = Future per capita generation (Kg./inhab./day)

G_{pa} = Current per capita generation (Kg./inhab./day)

$r\%$ = Rate of increase of generation in % (de 0.5 a 1%, Jorge Jaramillo, 2002)

n = number of years.

Assuming a constant generation or an annual growth rate of 0.5% in the CPG, the results obtained would be as follows:

Table 17 Projection of the Waste Generation

PROYECCION DE LA GENERACION							
AÑO	POBLACION No. de Hab.	GPC variable Kg/hab/día	GEN. MUNICIPAL Toneladas/día	GEN. TOTAL TON/AÑO	GPC constante Kg/hab/día	GEN. MUNICIPAL Toneladas/día	GEN. TOTAL TON/AÑO
2015	60,268	0,970	58,46	21337,89	0,97	58,46	21337,89
2016	60,460	0,975	58,94	21512,89	0,97	58,65	21405,86
2017	60,652	0,985	59,73	21800,92	0,97	58,83	21473,84
2018	60,845	1,000	60,84	22205,07	0,97	59,02	21542,17
2019	61,038	1,020	62,27	22727,80	0,97	59,21	21610,50
2020	61,233	1,046	64,03	23372,70	0,97	59,40	21679,54
2021	61,427	1,078	66,20	24164,63	0,97	59,58	21748,23
2022	61,623	1,116	68,79	25108,28	0,97	59,77	21817,62
2023	61,819	1,161	71,80	26206,41	0,97	59,96	21887,02
2024	62,015	1,214	75,30	27486,31	0,97	60,15	21956,41
2025	62,212	1,276	79,39	28976,53	0,97	60,35	22026,16
2026	62,410	1,348	84,13	30706,08	0,97	60,54	22096,26
2027	62,609	1,431	89,60	32704,86	0,97	60,73	22166,72
2028	62,808	1,527	95,90	35003,08	0,97	60,92	22237,17
2029	63,008	1,637	103,17	37657,58	0,97	61,12	22307,98
2030	63,208	1,764	111,51	40700,95	0,97	61,31	22378,79
2031	63,409	1,911	121,15	44218,02	0,97	61,51	22449,96
TOTAL ACUMULADO AL 2031				485890,00			372122,13

4.5 Future waste flow

For the calculation of the waste stream, it has been considered that per capita generation remains constant and that the change is due to population growth.

Table 18 1st phases: 0 – 5 years (2017 – 2021)

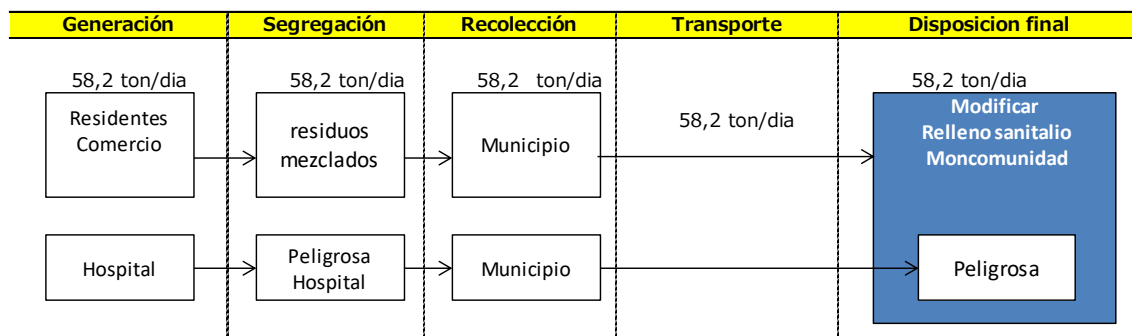


Table 19 Second phase: 5 – 10 years (2022 – 2026)

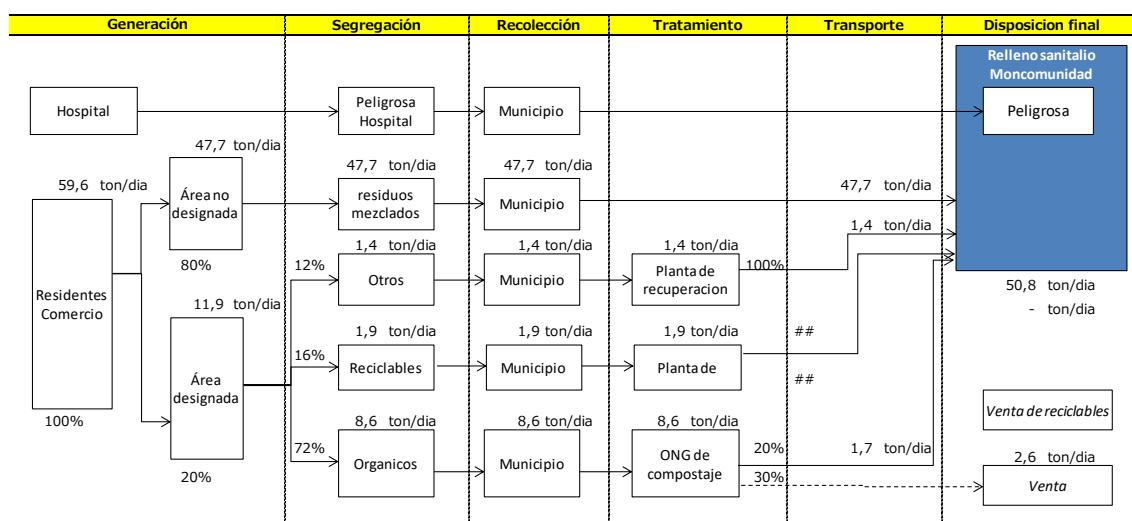
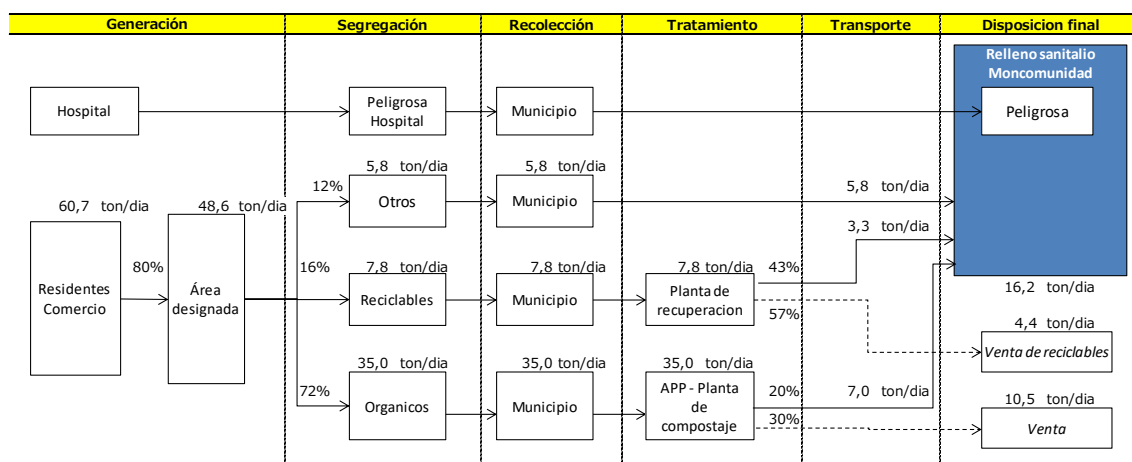


Table 20 Third phase: 10 – 15 años (2027 -2031)



4.6 Team for the ISWM

The body responsible for the implementation of the ISWM Plan is the Municipal Mayor, constituting a multidisciplinary team, which integrates personnel from the different departments related to ISWM, at least: the Department of Ornate and Cleaning, the Department of Municipal Environmental Management, the Department of social development and community participation and the communications division. The human resources department, legal department, municipal police and financial department are support departments for ISWMP implementation.

This team is led by the Deputy Mayor and will establish the required coordination with other institutions responsible for waste management (Ministry of Public Health, Ministry of Education, Ministry of the Environment and Natural Resources), as well as civil society organizations Neighbors, mothers' clubs, sports clubs, among others)

5 Definition of Policy, strategic and objective lines of ISWM

5.1 Policy

The top goal of the ISWMP is the improvement of sanitary conditions in the municipality.

5.2 Strategic lines

1. Control environmental pollution.
2. Promote financial sustainability.
3. Make all stages of SW management more efficient.
4. Promote public awareness and inter-institutional coordination for ISWM
5. Train all actors involved in the MRS at all levels.
6. To valorize the residues with potential of use, according to the existing local conditions.

5.3 Objectives

The general objective of the ISWMP is to establish a system of integrated management of solid waste generated in the municipality of Azua.

The plan comprises 3 phases: short, medium and long term. The objectives for each phase are listed below.

5.3.1 Short Term (5 years)

In general, the objective of this stage is to establish minimum conditions in the integrated management of solid waste.

5.3.2 In the medium term (10 years)

The general objective of the medium-term plan is to start the recovery of 20% of the SWM, separating the waste generated in the municipality into three fractions (organic, recyclable and others), as well as dispose the remaining ones in landfill.

5.3.3 Long term (15 years)

The general long-term objective is to achieve a culture change in the population,

in terms of its responsibility towards the ISWM and to consolidate the valorization of the SWM, through a public-private partnership.

5.4 Definition of responsibilities of the actors in the ISWMP

5.5 Department of Decoration and Cleaning

It is responsible, in coordination with the required departments, to plan, organize and coordinate everything related to the activities of the collection and transportation component and final disposal of this plan. Specifically:

- Elaborate the solid waste collection and transport program, establishing the schedules, routes and frequency of collection.
- Conduct time and movement studies to improve efficiency and effectiveness in the collection and transportation service.
- Ensure compliance with the standards of quality and efficiency in the provision of the service.

5.6 Department of Municipal Environmental Management

In accordance with the powers conferred by Law 64-00, the Environmental Management Units (MUMs) are responsible for supervising, coordinating and monitoring, with the departments involved in the execution of this plan, all activities Planned to achieve the objectives to be achieved, proposing to the City Council provisions related to the ISWM to be included in the corresponding ordinances

Law 176-07, among the functions assigned to the Municipal Environmental Units - UAMs, are:

- - Prepare the regulations for the preservation of the environment and natural resources of the municipality based on the general provisions contained in the law.
- - Make recommendations to municipal agencies so that the municipality ensures compliance with the General Environmental Law and the resolutions and regulations issued by national agencies for such purposes.

On the other hand, the Manual of Organization and Functions indicates as functions of the UGAM "to develop citizen education programs for the management and treatment of solid domestic, commercial, hospital and industrial waste produced in the municipality, for submission to the Council Municipal by the Mayor ".

5.7 The department of social development and community participation

Together with the Department of Municipal Environmental Management, it is responsible for coordinating, with organized civil society groups (neighborhood meetings, mothers' clubs, student associations, sports clubs, etc.), as well as with the community in general, all The actions required to ensure their full participation in decision-making and planned activities within the component of environmental education and public participation.

The organization and function manual assigns you the following functions, which may well be focused on the ISWM:

- Promote and promote citizen collaboration in municipal management, in order to allow the active participation of the community in the decision-making processes on matters within its competence.
- Conduct periodic meetings with the community to identify the problems and needs of the residents.
- Organize and coordinate with public and private institutions and community meetings, cleaning, vaccination and medical operations.

5.8 Communications Division

The organization and function manual assigns you the following functions, which may well be focused on the ISWM.

- Maintain optimal information and communication routes necessary for the proper positioning of the City Council, in relation to municipal programs, projects and activities.
- Ensure that the image of the City Council, inside and outside, is excellent and conducive to positive interactions for the promotion of municipal services offered.
- Participate in the effective organization and execution of activities and events within the area of competence of the City Council.
- Inform and guide the public in relation to the services offered by the City.
- Prepare and execute programs for the dissemination of activities and works emanating from the City.
- Coordinate and supervise the development of audiovisual materials that support the activities, programs and projects of municipal development.
- Coordinate and supervise the preparation of any written or printed material to be disseminated in the media.
- Plan, in coordination with the authorities of the City Council, participation as

a local government in the media, such as: TV programs, radio, interviews, among others.

- Collaborate in the assembly of seminars, workshops and any other event arranged by the municipal authorities.
- Coordinate internal and external institutional announcements of the institution.
- Coordinate and supervise the production of special publications, such as: magazines, books, brochures, memoirs, among others.
- Organize and keep all written or printed material that relates to the areas of competence of the City Council.

5.9 Support departments or support to the ISWMP Implementation

Team Finance Department / Accounting Division

Among the functions assigned to this division by the 'Organization and Functions Manual' are: "to keep records and control of all income, expenses, accounts payable and other accounting operations of the City Hall, in accordance with accounting principles generally accepted". In this sense, this division is responsible for the execution of the activities of the financial management component of this ISWMP, in coordination with the required departments.

Legal Division

It is the responsibility of the legal department to support, in coordination with the corresponding departments, all activities related to the legal component contained in this ISWMP.

Division of human resources

According to the manual, the general objective of this division is to "Implement and develop a human resources management system, which is framed in Law No. 41-08 and the Municipal Public Server Statute, to ensure the existence of motivated public servants and suitable that contribute to the achievement of institutional objectives." We highlight among its functions, those most directly related to the MIRS, namely:

Principal functions:

- Program and execute the development of the different human resources management subsystems, established for the institution, such as:
 - ✓ Training and Development

✓ Recruitment, Selection and Performance Evaluation

- Coordinate, with other areas of the institution, the strategic planning of human resources, in the short, medium and long term, for the achievement of its objectives, in coordination with the Financial Administrative Department, and in line with the Strategic Plan defined by the Town hall.
- Develop and implement the annual staff training and training program, in coordination with the INAP and other entities, both governmental and non-governmental, aligned with the gaps detected in the employee performance evaluations and the Strategic Plan.
- Enforce the internal regulations established for staff.
- The role of the Human Resources Division is fundamental in the development of the evaluation of the competencies of the personnel assigned to the MIRS, the training of the personnel to prepare them for the new requirements of the MIRS and the performance evaluation under the new standards of efficiency and quality Established.

Municipal Police

The municipal police is a support and monitoring body for compliance by the responsible departments and the citizens with the provisions contained in legal instruments created to achieve the ISWMP objectives.

6 Plans by component and by phases

Annex XX presents the Master Plan for the Integral Management of Solid Waste for the first phase of the plan (short term). In the medium and long term case, Annex XX presents the objectives and the main lines of action, leaving the master plan to be worked during the last year of the first phase of the plan.

For the short term the general objective has been defined and all the following aspects have been specified for each component of the MIRS:

- Specific objectives
- Tasks to do
- Responsible
- Resources / Inputs required for each proposed activity
- Means of Verification
- Date of compliance
- Amount of money required for execution

Here are the specific objectives for each component.

6.1 Short Term - Master Plan

6.1.1 Generation

The objective is focused on the separation in the source of generation of hazardous waste from health centers and related, with a view to its exclusion from the municipal collection service.

6.1.2 Temporary storage and delivery

The objective is to promote the use of closed-rigid containers for delivery to the collection service, in order to prevent the occurrence of anti-sanitary conditions.

6.1.3 Collection and transportation

There are two objectives:

- a) Increase collection coverage of MSW (15% from the current situation) and frequency (2 times per week).
- b) Exclude Hazardous Waste from health centers and related establishments of the municipal collection service.

6.1.4 Recovery and Intermediate Treatment

The objective is to increase the recovery of recyclable materials by controlling the activity of recovery of materials by divers in the FDS by those responsible for their operation.

6.1.5 Final Disposal

Three objectives are considered:

- a) Carry out the final disposition controlled in common with other municipalities and DMs of the province.
- b) Prevent / control illegal dumping throughout the municipality.
- c) Define the new joint disposal site (0-3 years).

6.1.6 Education and public participation

Promote community participation and commitment in the ISWM, prioritizing the student population and neighborhood councils.

6.1.7 Financial management

Improve the financial sustainability of the ISWM. The privatization of collection management is considered. The lines of action are based on increased revenues and lower costs.

6.1.8 Organizational and institutional aspects

- a) Raise the level of institutional capacity for the MIRS and adapt the organizational structure to the new requirements.
- b) Promote the functionality of the team responsible for the implementation of MIRS and support departments.

6.1.9 Legislation

Legitimize the implementation of the measures required to achieve the objectives of the ISWM. It contemplates the elaboration of the legal instruments that are required and the application of sanctions.

6.1.10 Environmental and social aspects

Control pollution and improve the environmental quality of the FDS and its surroundings, as well as establish minimum sanitary conditions for the recovery

of materials in the landfill (by the existing divers)

6.1.11 Monitoring and follow-up

Ensure achievement of the ISWMP objectives for this phase and establish system for measuring the level of satisfaction of users of ISWM services.

6.2 Medium-term objectives and lines of action

The general objective of the medium-term plan is to initiate the recovery of 20% of the waste generated in the municipality, separating into three fractions (organic, recyclable and others), as well as dispose the remaining in landfill.

In each component of the ISWM the specific objectives are as follows:

6.2.1 GENERATION / SEGREGATION

Separate 20% of common municipal waste generated in municipal households in three fractions: (organic, recyclable and others).

6.2.2 TEMPORARY STORAGE AND DELIVERY

Establish clean points for collective delivery of recyclable waste for collection by the municipality for 20% of households and standardize the containers used for temporary storage and delivery.

6.2.3 COLLECTION AND TRANSPORTATION:

- a) Increase the collection coverage to 100%.
- b) Collect and transport selectively the waste generated in 20% of households in the municipality.
- c) Establish a separate collection program for pruning and bulky waste.

6.2.4 INTERMEDIATE TREATMENT AND RECYCLING:

- a) Gradually increase the annual organic waste generated in 20% of the municipal households.

The establishment of an alliance with NGOs for the manufacture of compost and the installation of a separation and classification plant for recyclable materials collected in 20% of the municipal households is envisaged.

Note: It is necessary to discuss the mode of operation and the participation of the city council (s) belonging to the Municipal association (if owner or subcontractor).

- b) Formalize the divers for the recovery of the recyclable materials with commercial value that arrive at the FDS, by means of the creation of cooperative or another form of association.

6.2.5 Final Disposal:

Carry out the final disposal of unused municipal waste in a joint landfill / controlled dumping site.

6.2.6 CITIZEN EDUCATION AND PUBLIC CONSENSUS

To increase the participation and commitment of the community in general in the actions to be implemented, focusing on the "Culture of the 3Rs" in the sectors where the separation at the source has begun.

6.2.7 FINANCIAL MANAGEMENT

To increase the financial sustainability of the solid waste management, reaching a coverage of 50% of the costs by means of revenue from collection of the service.

6.2.8 LEGAL ASPECTS:

- a) Adapt the existing legal basis to the new ISWM requirements, by modifying / issuing new ordinances, as required.
- b) Ensure the application of the municipal legal framework in the ISWM.

6.2.8 ORGANIZATIONAL AND INSTITUTIONAL ASPECTS:

Strengthen the institutional capacity for the MIRS and ensure the functionality of the team responsible for implementing the ISWM and support departments.

6.2.9 ENVIRONMENTAL AND SOCIAL ASPECTS

To improve the control of the contamination and environmental quality of the FDS and its surroundings, as well as to ensure appropriate conditions for the recovery of materials in the FDS.

6.2.10 MONITORING AND FOLLOW UP

Ensure achievement of the ISWMP objectives for this phase and increase the level of satisfaction of users of ISWM services.

6.3 Long-term objectives and lines of action

The general long-term objective is to achieve a culture change in the population, in terms of its responsibility towards the MIRS and to consolidate the valorization of the MSW, through a public-private alliance (APP).

In each component of the ISWM the specific objectives are as follows:

6.3.1 GENERATION / SEGREGATION

- A) Separate common municipal waste generated in 80% of municipal households in three fractions: organic, recyclable and others.
- B) Separate so-called "special management waste" generated in households.

6.3.2 TEMPORARY STORAGE AND DELIVERY

- a) Standardize the containers used for temporary storage and delivery in 100% of the sectors of the municipality.
- b) Extend to the whole municipal territory the clean points for the delivery of the recyclable materials.

6.3.3 COLLECTION AND TRANSPORTATION:

- a) Collect selectively the common waste generated in 80% of households in the municipality.
- b) Collect separately the so-called "special management waste".

6.3.4 INTERMEDIATE TREATMENT AND RECYCLING:

- a) To value the organic waste generated in 80% of the municipal households, through the establishment of a PPP for the manufacture of compost.
- b) Extend the capacity of the plant to the required level and establish improvements in the recovery system of recyclable materials.

6.3.5 FINAL DISPOSAL

- a) Establish improvements in the joint FDS, according to the existing situation and in accordance with the legal framework.
- b) Reduce the amount of waste destined to the sanitary landfill, through its eventual incorporation to the coprocessing.
- c) Define the closure plan of the site and its preparation for post-closure use.

6.3.6 CITIZEN EDUCATION AND PUBLIC CONSENSUS

Raise the participation and commitment of the community in the actions to be implemented, focusing on the "Culture of the 3Rs", especially in the reduction in the source.

6.3.7 FINANCIAL MANAGEMENT:

Guarantee the financial sustainability of the MIRS, reducing by 70% the subsidy by the city hall.

6.3.8 LEGAL ASPECTS

Adapt the legal framework to the new requirements and consolidate its application.

6.3.9 INSTITUTIONAL AND ORGANIZATIONAL ASPECTS

To guarantee the institutional capacity of the municipality in the ISWM, through the existence of a consolidated team and the commitment of the support departments.

6.3.10 ENVIRONMENTAL AND SOCIAL ASPECTS

- A) Ensure the environmental quality of FDS and its surroundings.
- B) Eliminate recovery of materials in the FDS.

6.3.11 MONITORING AND FOLLOW UP

- a) Ensure the achievement of the ISWMP objectives for this phase and increase the level of user satisfaction of the ISWM services.
- b) Define the post-closure monitoring plan of the FDS.

7 CONCLUSION

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List of contributors of the city council

List of employees assigned to RS

Ordinance No. 08-2014 on Refreshment of Ordinances

Energy and Mines says six basins have potential oil in DR by **UBALDO GUZMÁN MOLINA**

u.guzman[[@](mailto:u.guzman@hoy.com.do)]hoy.com.do

October 25th, 2016



The Ministry of Energy and Mines reported yesterday that there are six areas with potential in hydrocarbons in the country, for which further research should be carried out to determine probable oil deposits in the Dominican subsoil.

The areas with the greatest potential are in the Enriquillo, Azua, San Juan, San José de Ocoa, San Pedro de Macorís and Cibao Oriental basins, where there are faults and structures that could act as traps to retain oil. The data were presented by Jorge Granados, Manager of Geosciences for Mexico and Central America of Schlumberger's Software Integrated Solutions Department, who

pointed out that in the San Juan basin "Ocoa and Neiba rocks are in oil generation window" and that there could be Potential of deep-lying oil fields.

The Enriquillo basin has the greatest potential for oil exploration purposes, covering an area of 180 square kilometers, while the Azua exploration potential is 13 square kilometers. In the past in Azua some wells were dug in search of oil.

In the Enriquillo basin, the expert said that "there are definite traps that coincide with the generating foci, where the rocks Sombrerito and Plaisance are in the window of oil generation". In the Azua basin it was determined that there are "structural highs that function as storage traps for hydrocarbons".

The Minister of Energy and Mines, Antonio Isa Conde, explained that "the interest is that these studies be exploited to the maximum by scientists, environmentalists, companies, investors and civil society."

He explained that from the shared information it is possible to open a debate about the potential in hydrocarbons. "We have to assume the development of the hydrocarbon potential with due responsibility and for that reason before presenting this information publicly, we devised a regulation to establish clear rules for exploration activity in the future," said Isa Conde.

He said that there is interest from investors for the oil exploration work in the country.

"We are putting ourselves on the global radar of the hydrocarbon industry," he said.

In the bidding will win who makes the best offer for exploration, he said.

He promised that concessions would not be granted "a la brigandina"(Without previous planning), because transparency is the objective of the Ministry of Energy and Mines.

He said the Schlumberg Company, which has been working for two years, will charge RD \$ 20 million. The company won a tender to create the National Hydrocarbon Data Base.

With the new seismic interpretation, said the expert Granados, could identify targets in the subsoil to drill deep exploratory wells and to collect lithological information.



QUIEN PUEDA INTERESAR

*Asunto,
Por medio de la presente certificamos que tomando como
parámetro
Algunos pozos que están ubicados en el área del vertedero del
ayuntamiento de azua., tenemos a bien informar que el nivel
freático
De la zona esta por debajo de los pozos aproximadamente.
Los cuales están a unos 220 pies de profundidad aprox.*

*Esta certificación se pide por la parte del interesada a los fines
que consideren de lugar.*

*Dado ala ciudad de azua a los cinco días del mes de junio del
dos mil catorce.*



ATTE. ING. MANUEL GUILLERMO COMAS

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Sánchez City Hall
Samaná Province, D.R.



**Integrated Solid Waste Management Plan
(ISWM) for the municipality of Sánchez,
Period (2017-2031)**

May 2017

ABBREVIATIONS

FOCIMiRS	Project for the Development of Institutional Capacity in Solid Waste Management
JICA	Japan International Cooperation Agency
SDF	Final Disposal Site
GIS	Geographic Information System
UGAM	Municipal Environmental Management Unit
PO	Plan of Operation
PPC	Producción per Cápita
PNUMA	Environmental National Program
RS	Solid Waste
RSM	Municipal Solid Waste
RSU	Urban Solid Waste

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1 Introduction

Given the current situation of municipal solid waste management (SWM), the demands of the population, the interest of the central government and from our perception as a municipal government, on the importance of environmental conservation and integral solid waste management, as one of the main tasks of MARENA and of the municipalities during the next fifteen years.

We agree with the responsible approach that has been given to this problem and in particular with regard to the preservation of life, by reducing the impact on human health, natural resources and the environment in general. In this sense, the municipality of Sanchez adds to the approach that suggests that the valuation of municipal solid waste is a prevailing need worldwide and we are aware that at the moment represents a great opportunity for the Dominican Republic, either by the application of technologies to incorporate them into the healthy cycle of materials, or to take advantage of the energy they contain, as well as the existence of a wide range of offers of technical and business possibilities that are constantly developing.

At present the generation of SWM is constantly increasing, as well as a significant change in its composition due to the development model we have adopted as a country, along with industrial development, economic and population growth, the accelerated and disordered urbanization process, changes in modes of consumption, among other factors; however we understand that the solution to this problem will not be possible as long as the actors are not summoned around an integrated management for the SWM, with an inter-institutional and national character, involving the population and the central government, as entity responsible for establishing mechanisms and public policies for the conservation of life and the environment.

We welcome the management of the Ministry of Environment and Natural Resources and the Japan International Cooperation Agency to implement at the national level the project "Strengthening Institutional Capacity in Solid Waste Management" (FOCIMIRS) in the year 2014, from which the elaboration of this plan is derived.

The idea is to present the municipality of Sánchez, an effective tool to help solve the problem in question and at the same time obtain tangible and non-tangible benefits.

2 Current situation of the SWM in the Municipality of Sánchez

2.1 Socioeconomic conditions

Currently, the municipality of Sánchez is considered a purely agricultural municipality, whose economy is based on the production of items such as: Rice, cassava, yautía, yam and others in small amounts.

The other relevant aspect is fishing. From this activity, a small part of the population (fishermen) obtains their livelihoods, but uses illegal fishing gear, contributing to significantly reduce this important economic activity.

Fishing is the predominant economic activity in the municipality of Sánchez, followed by the production of rice in the wetlands from the miles zones, which delimited the railroad route.

Trade is an important activity, it includes citizens who work in different companies, in different areas of the country and remit economic resources to families, both from other provinces and abroad, especially from the United States of North America.

Regarding the mining aspect: It should be noted that there are two companies extracting aggregates (Agregados Santa Bárbara, SRL and Agregados Sánchez, SRL), also a Concrete company (Hormigones del Atlántico, SRL), a block factory blocks (Centro industrial del Nordeste. C.I.N., S.R.L.).

In relation to tourism: The Municipality has initiated important negotiations and today, Sánchez is visited by tourists who come during the cruise season and with it certain economic benefits boost the movement of resources in the municipality.

Table 1 Economic indicators of the municipality to the year 2010.

Indicadores de economía, año 2010	
Cantidad de parceleros de los asentamientos campesinos, 2009	4,042
Superficie (en tareas) de las parcelas de asentamientos campesinos, 2009	372,015
Cantidad de concesiones de explotación minera , 2010	4
Cantidad de empleados de empresas de Zonas Francas y Zonas Francas Especiales , 2009	0
Índice de feminización de plantillas Z.F.*	0.0
Cantidad de hoteles, 2008	9
Cantidad de camas en hoteles, 2008	78
Cantidad de colmados y colmadones identificados por el PSD**	154

Fuente: Relación de Establecimientos de Alojamientos Hoteleros (Ministerio de Turismo)
Boletín Estadístico de Zonas Francas (Consejo Nacional de Zonas Francas y Exportación)
Relación de Asentamientos Campesinos (Instituto Agrario Dominicano)
Levantamiento de colmados y colmadones (Ministerio de Interior y Policía)

*Z.F.: Zonas Francas

**PSD: Plan de Seguridad Democrática

Source: MEPYD, 2010.

In the municipality of Sánchez, the Ministry of the Environment identifies four protected areas: Panoramic road Nagua - Sánchez and Nagua - Cabrera, Los Haitises National Park, Lower Yuna Manglares National Park, and the marine mammal sanctuary Sanctuary of the Banks of La Plata and La Navidad.

In terms of education, currently the Sánchez 14-05 district has a total of 18 schools, with a student enrollment of 6,254 students at different levels (data updated as of January 30, 2016). Although the census of the year 2010 gives the following statistics:

Table 2 Population indicators of the municipality to the year 2010

Población de 5 y más años por sexo, según el nivel de instrucción alcanzado o terminado, año 2010			
Nivel de Instrucción alcanzado	Hombres	Mujeres	Total
Nunca asistió a la escuela	1,121	717	1,838
Preprimaria	884	755	1,639
Primaria o básico	5,570	4,672	10,242
Secundaria o media	3,163	3,275	6,438
Universitaria o superior	720	1,439	2,159
Total	11,458	10,858	22,316

Fuente: IX Censo Nacional de Población y Vivienda 2010

Obviously, this shows a strong discrepancy, since 91.67% of the population, for one reason or another, cannot be in schools.

Certainly, the economic sphere of the population of the municipality of Sánchez is structured mainly in the agricultural, mining, financial, fishing and aquaculture sectors, as shown by the following statistical data:

Table 3 Labor indicators in the municipality.

Estructura del mercado laboral por sexo, año 2010			
Indicadores	Hombres	Mujeres	Total
Población en edad de trabajar (PET)	10,217	9,695	19,912
Población económicamente activa (PEA)	4,923	2,328	7,251
Población ocupada	4,569	2,155	6,724
Población desocupada	354	173	527
Población inactiva	5,145	7,256	12,401
Tasa global de participación	48.2	24.0	36.4
Tasa de ocupación	44.7	22.2	33.8
Tasa de desempleo	7.2	7.4	7.3

Fuente: IX Censo Nacional de Población y Vivienda 2010

It should be noted that in the area of agricultural production, this is based on smallholdings, especially because peasants practice artisanal agriculture, using tools such as ax, machetes, shovels, and oxtail, among others.

Coconut has been considered as the main product of the province of Samaná and, consequently, of the municipality of Sánchez, however, although there are some commercialization centers, these have reduced significantly, because the coquera population is much greater and has not been Renewed, consequently most of this population is infected by mites, etc., that leaves out this farm as way of sustenance.

2.1.1 Population

The municipality of Sánchez, together with its sections and sites, has a population of 24,509 inhabitants, according to the national population, housing and agricultural census, of which 12,583 (51.34%) are men and 11,926 (48.66%) are women.

Table 4 Final demographic results for the year 2010.

Población del municipio por sexo, según distrito municipal, año 2010			
Municipio y distrito municipal	Sexo		Total
	Hombres	Mujeres	
Sánchez	12,583	11,926	24,509
Total	12,583	11,926	24,509

Fuente: IX Censo Nacional de Población y Vivienda 2010

1) Population Projection

The projection of the population in the municipality of Sánchez has been taken by applying the growth rate used by the National Statistical Office (ONE) for the period 2010 to 2031, as follows:

Table 5 Population projection to the year 2030

Qty	Year	Rate	Population (-0.07%-ONE)	Amount Generated residues ton/day	Amount Residues ton/year
-	2002	0.00	26,505	0	0
-	2010	0.00	24,509	0	0
0	2015	0.00	24,509	20.5	7,483
1	2016	0.00	24,509	20.5	7,483
2	2017	0.00	24,509	20.5	7,483
3	2018	0.00	24,509	20.5	7,483
4	2019	0.00	24,509	20.5	7,483
5	2020	0.00	24,509	20.5	7,483
6	2021	0.00	24,509	20.5	7,483
7	2222	0.00	24,509	20.5	7,483
8	2223	0.00	24,509	20.5	7,483
9	2224	0.00	24,509	20.5	7,483
10	2225	0.00	24,509	20.5	7,483

Qty	Year	Rate	Population (-0.07%-ONE)	Amount Generated residues ton/day	Amount Residues ton/year
11	2226	0.00	24,509	20.5	7,483
12	2227	0.00	24,509	20.5	7,483
13	2228	0.00	24,509	20.5	7,483
14	2229	0.00	24,509	20.5	7,483
15	2030	0.00	24,509	20.5	7,483
16	2031	0.00	24,509	20.5	7,483

Note: According to the ONE, 2010 census, the population decreased by 0.07%, so no growth is projected until the next census to be held in 2020.

2.2 Meteorological conditions

The municipality of Sánchez is located in the lower part of the province of Samaná, in its geographical delimitation, it has to the south the province of Monte Plata and the National Park of the Haitises, to the West the province Maria Trinidad Sánchez and the zone corresponding to the Low Yuna and consequently the national park Manglares del Bajo Yuna, to the North the special municipality of Las Terrenas and to the east the Municipality of Santa Bárbara.

Therefore, the precipitations that are generated are quite copious in the municipality, since both national parks have a great number of wetlands that are very efficient generators of precipitation cycle, indicating that unless there are adverse meteorological conditions, most of the year rains, which promote good agricultural production.

The Samaná Province presents a typical pattern of pluviometric seasonality with lower values towards the winter months, increases towards the spring months, where they keep fluctuating until the beginning of winter, where they fall again. The pattern of seasonal variation also reflects the uneven distribution of rain within the provincial territory, which is maintained throughout the year, with differences between localities excluding Sanchez.

The most extensive flooded area is located to the west of the Samaná Province, in the Municipality of Sánchez and is made up of La Majagua, Gran Estero and Bajo Yuna with large extensions of low-lying areas. During Tropical Storm Noel in October 2007 part of this area was highly flooded with severe damage.

The following table shows the seasonal data of maximum temperature (T max), minimum (T min) and average (T avg.), in the municipality of Sánchez in the period 1961-1990, according to Word Climate (2013).

Table 6 Seasonal data of maximum, minimum and average temperature.

Localidad	Parámetro	E	F	M	A	M	J	J	A	S	O	N	D	Annual
Sánchez	T max	29.8	30.1	30.5	30.9	31.7	32.3	32.4	32.1	32.3	32.2	30.4	29.5	31.2
	T min	20.2	20.4	20.8	21.3	22.8	23.7	23.7	23.5	23.3	23.1	22.0	20.8	22.1
	T prom	25.0	25.3	25.7	26.1	27.3	28.0	28.1	27.8	27.8	27.7	26.2	25.2	26.7

Fuente: Word Climate (2013).

2.3 Economic Projection

In order to obtain the necessary data concerning the economic projections of the municipality of Sánchez, it has been investigated in various sources, such as in the National Statistical Office and the Ministry of Economy Planning and Development, with no conclusive results to the request, except some behavioral information for few economic sectors. Therefore, the following information is provided:

Fishing is identified as the primary economic use variable of the community, which depends on the conservation of natural resources and the productivity of the estuary. In order of importance the fishing of shrimp, crabs and assorted fish. In research carried out on this activity, the use of illegal gear, such as the blender, trawls with very fine mesh and long nets that extend for kilometers affecting their productivity were determined.

Regarding fishing, there is an intensive use of the bay, where fishermen perform all kinds of fishing activities, using the area of mangroves, rivers and streams for crab fishing. As for the bathymetry, they can now cross the estuary walking, from the shore to about 1km out, the water barely reaches ½ meter high, increasing progressively thereafter. At present the mouth of the river Yuna and Barracote are sedimented, which makes it necessary to use boat to reach the community of Laguna Cristal, the tour operators must ensure a high tide to have a small margin of buoyancy.

The second variable of identified use is agriculture and livestock, with rice and livestock farming as the main cattle activity. An important factor that the villagers present is that much of the livestock, as well as the production of other minor crops, come from the conucos they maintain in the grounds of the National Park Los

Haitises, a practice that has been increasing for some years, the fishing yolks are used more frequently for transfer this production from one end of the bay to another.

On the map of Sánchez, the Yuna - Barracote flood zone has increased, bringing with it the consequent increase in the forests of Drago and the marshes. The area devoted to planting rice is traditional, although it has decreased somewhat due to seasonal flooding of the river, damaging crops in many cases.

They attribute this to the poor planning of the dams and the poor work done by the Aglipo II Project, led by the National Institute of Hydraulic Resources (INDRHI). The grazing areas have increased, because when the land is damaged for the production of rice, they plant grass. Also, shown on the map, the intensive use of the land of the Los Haitises National Park for agriculture, especially of smaller fruits (yams, bananas, etc.) and the use of grazing land, has remained as traditional even after eviction of the families that lived in the Park.

2.4 Generation and composition of solid waste

The current generation amount is 27.4 tons / day, divided into 25% recyclable waste (12% other plastics, 4% Pet, 9% glass); 63% organic waste and the remaining 12% corresponds to other waste.

Table 7 Municipal waste generators

Generators	Population	Unit	Kg/Unit	Ton/Day
Domiciliary	19,995	Personas	0.59	27.4
Public Market	28	Empleados	0.65	6.64
Public hospital	10	Camas	0.75	2.7
Real Estate Management	19	Camas	1.4	9.7
Schools	4,403	Persona	0.075	120.5
Hotels	54	Habitaciones	1.55	30.5
Total	24,509	Personas	5.015	197.4

Source: Results of studies carried out by the technical team of the FOCIMIRS project (2016).

Note 2: For the Kg / Unit, the characterization study of Gran Santo Domingo is taken as a reference, reducing by 50% in values to adapt them to the reality of the municipality.

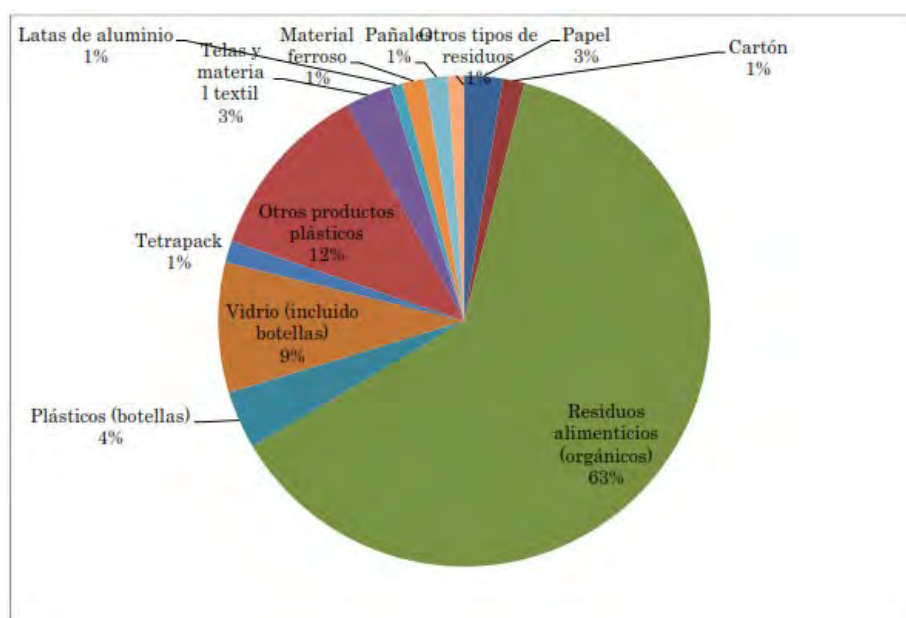
2.4.1 Physical composition of household waste

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

Graphs 1,2 and 3 present the composition of the residues in each of the studied quintiles: high, medium and low, respectively.

Graph No.1 shows that 63% of the waste generated in the municipality of Sánchez for the high socioeconomic quintile is organic food, 12% other plastic products, 9% glass (including bottles) and 4% plastic bottles.

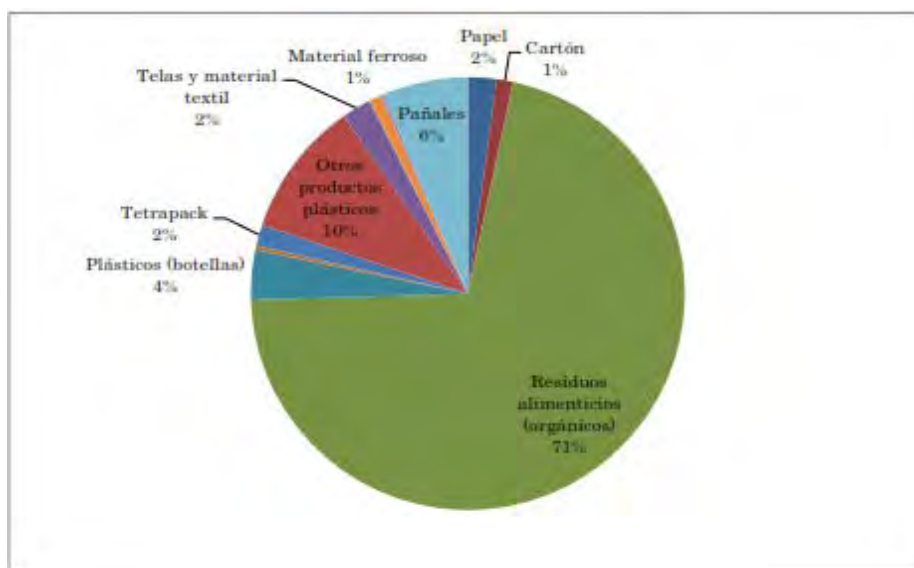
Graph 1 Percentage physical composition of household waste in the municipality of Sánchez: high quintile.



Source: Characterization study, carried out by the FOCIMIRS team, (2015).

Graph.2 shows that 71% of the waste generated in the municipality of Sánchez for the average socioeconomic quintile is organic food, 10% other plastic products, 6% diapers, and 4% plastic bottles , among other residues.

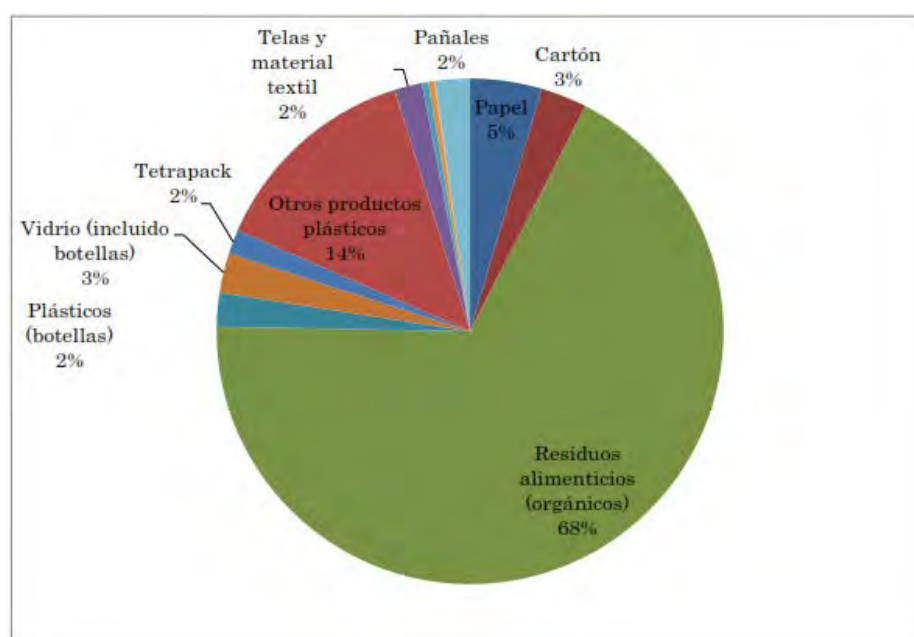
Graph 2 Percentage physical composition of household waste in the municipality of Sánchez: average quintile.



Source: Characterization study, carried out by the FOCIMIRS team (2015).

Graph .3 shows that 68% of the waste generated in the municipality of Sánchez for the low socioeconomic quintile is organic food, 14% other plastic products, 5% paper, 3% carton and Another 3% glass, among other residues.

Graph 3 Percentage physical composition of household waste in the municipality of Sánchez: low quintile.



Source: Characterization study, carried out by the FOCIMIRS team (2015)

It should be noted that the main generation for the three socio-economic quintiles studied corresponds to organic residues, which reveals an average of 67.33%, that the highest proportion of organic comes from the average 71% quintile. As regards the inorganic ones, the majority fraction is plastic in its different types, equivalent to 12% in average in all the quintiles. An interesting aspect is the generation of an average 3% of disposable diapers and that the generation of glass including bottles is 6%, since only two quintiles were those that produced that type of waste.

2.5 Current Waste Flow

In the municipality of Sánchez, 27.4 Ton / day are generated, which can be seen in the table, which is presented here. The City collects 23.5 Ton / Day, which corresponds to 85.76%, although the data released by the 2010 census show that there is a 41.1 that did not receive this service, according to the statistical data shown below.

Table 8 Environmental Indicators.

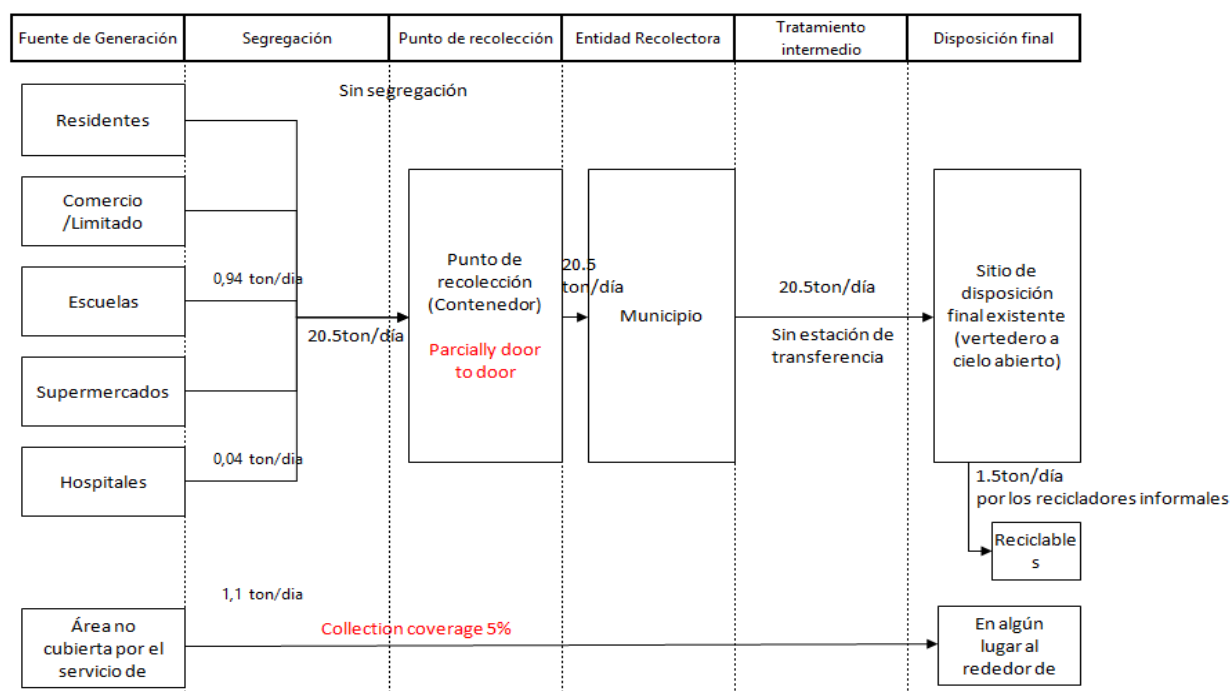
Indicadores medio ambientales	
Porcentaje de la superficie de los suelos de tipo I y II, con respecto a la superficie total de los suelos, 2003	4.2
Porcentaje de hogares que utilizan combustibles sólidos para cocinar, 2010	11.2
Porcentaje de hogares particulares sin recolección de basura, 2010	41.1
Porcentaje de hogares con abastecimiento de agua por red pública dentro de la vivienda, 2010	40.9
Porcentaje de hogares sin inodoro en la vivienda, 2010	47.1
Fuentes: IX Censo Nacional de Población y Vivienda 2010	

Of the waste generated / collected, 80.29%, equivalent to 22 Ton / Day, are taken to the disposal site. This indicates that a significant percentage is valuable for commercial purposes, while families residing in the vicinity of the rivers and glens, dump the waste generated in those places, and also some clandestine dumps, and / or vacant lots.

Table 9 Solid waste stream in the municipality of Sánchez.

Total Generated	Source Segregated	Recollected	Transported	Treated	Final Disposal
27.4 Ton/day	N/A	23.5 Ton./day = 86%	23.5 Ton./day = 86%	N/A	22.0 Ton. /day = 80%

Note: The volume of waste is considered based on the capacity / t3 of the transport equipment. Since we do not have transfer station and weighing.



Source: Waste flow study, FOCIMIRS equipment (2016); JICA.

Figure 1 Current status of waste stream

2.6 Current Practices of SWM.

2.6.1 Temporary storage and delivery

The storage of residues at the residential level, is carried out under the form of containers and also door-to-door. In some sectors, residents must take the waste from their homes to the containers placed in the streets, and in others, depending on routes and road conditions, they are collected at their doors.

Regarding the current situation of the containers, a study was also carried out within the FOCIMiRS Project in the year 2015. During this study it was observed that most of the containers are already in poor condition and require replacement.



Photo 1 Containers placed by the City Hall in the streets of the Municipality of Sánchez.

2.6.2 Collection and transportation

The collection of municipal solid waste is under the full responsibility of the City Hall, there is no external subcontracting for these purposes. Currently of a total of 8,000 existing homes in the municipality, approximately 95% benefits from the collection, that is, about 7,600 households, both in the urban area and in rural areas.

Our current collection program runs 5.5 times per week, in the urban area (from Monday to Saturday at noon), and the rural area twice a week.

It is planned to expand the designated area of separation at source for the whole municipality.

1) Vehicle fleet for Collection

The municipality counts on eight (08) units for the collection of municipal solid waste, but they are in a progressive state of deterioration, mainly because they have exhausted their useful life and certainly the system becomes practically unsustainable, because maintenance costs are usually very high each month.

The fleet is divided as follows:

Table 10 Loading capacity of waste collection equipment

FILE	BRAND	TYPE OF EQUIPMENT	LOAD / TON	OBSERVATIONS
ADS-01	ISUZU	Household collector / compactor	1.486	Japanese
ADS-02	DAIHATSU		1.486	Japanese.
ADS-03	ISUZU	Household collector / compactor	1.486	Japanese
ADS-04	IVECO	Household collector / compactor	6.5	Italian / single metal containers in the process of dissolving this system.
ADS-05	MACK		10	American
ADS-06	DAIHATSU	Compactor / Metal Container	01	Japanese
ADS-07	TOYOTA	Collector / compactor, plastic containers and loose corporate and residential waste.	1.5	Japanese.
ADS-08	NISSAN	Bed collector open for pruning and other residential organic.	1.5	Japanese

Source: Inventory of the city of Sanchez (2010-2016).

The waste collection system of the municipality of Sánchez, is currently in a planning stage for its complete improvement.

The situation warrants the implementation of new measures and procedures throughout the municipality, in order to change the image that exists in the urban area, as well as in the final disposal and rivers and canyons that cross the municipality.

The levels of pollution at first sight are alarming, which motivates and mobilizes the municipal authority to implement precise measures to correct the current problem and prevent a worsening of the situation in the near future.

2.6.3 Intermediate treatment and recycling

Currently in the municipality of Sánchez, there is no formal recycling activity, except for the three pilot communities selected under the FOCIMIRS Project, where residents are separating the waste into organic and inorganic waste. Also in the disposal site (landfill) and the streets, divers recover some recoverable waste (cardboard, glass, plastics, metal). The percentage of recovered materials with commercial value is not yet known.

The pilot project for separation of solid waste at the generation source in Sánchez, mentioned above, takes place in different municipal areas; Lectures, workshops, conferences and on-site practices are held. They are carried out in the neighborhood meetings, schools of District 14-05, among other institutions representative of the living forces of the municipality of Sánchez, with the aim of integrating and raising the awareness of families on the Integral Management of Solid Waste through the methodology of the 3R's.

The pilot project contemplates that the Sanchez City Hall install clean points, exclusively destined to deposit the recoverable residuals (voluntarily separated), in such a way as to maintain the environment of separation at the source and families feel fully committed to the Integrated management of the waste they generate in their homes.

These actions include the registration of persons engaged in voluntary and commercial activities for collection of recoverable waste; With the purpose of maintaining a control of the people who carry out these activities the municipality.

Also, a registry of the companies or businesses that are dedicated to the acquisition of metallic residues, calamine, copper, plastics, electronic, batteries, among others, in such a way that the collection becomes an economic activity for groups focused in the municipality of Sánchez.

In the final disposal site and in the streets of the town, there are informal divers who are dedicated to the separation and use of some materials, among which are

mentioned plastics, cartons, glass, iron, etc., which are sold other formal and informal buyers who visit the final disposal site and some homes to make the purchase of recyclables.

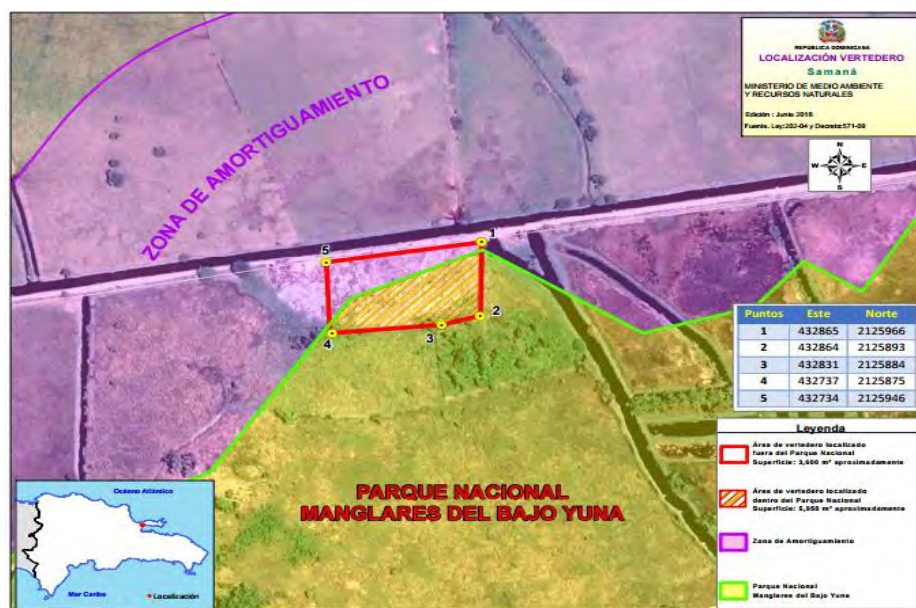
2.6.4 Final disposal

The landfill of the municipality of Sanchez has a land area of approximately 16 hectares, located, used in 95% for final disposal open and without cover, where soil, surface water and groundwater contamination turns out to be one of the problems of greater impact, as well as air pollution, due to the burning of waste made. Although the location of the landfill is at a distance of 6 kilometers from the nearest human population, it is a great challenge for the municipality because it is in the buffer zone of the national park Manglares del bajo Yuna.

The city council has a grinder (motor grader) and a mechanical shovel, as equipment that is used periodically for the conditioning of the landfill, although they work with great deficiencies. To perform the coverage once a year, some loan equipment is requested from another state institution, such as a bulldozer at INDRHI.

There are not adequate pits for the deposit and coverage of the waste, this is one reason why there are waste discharges along the way, from the area of Los Mangos to the landfill.

This open landfill is located in an area that deserves urgent attention because it is located in the vicinity of a river or greater channel of Bajo Yuna and the generation of leachate is out of control due to the high humidity of organic waste and the climate of the area. According to the study by the Geographic Information System (GIS) of MARENA, this area designated as a landfill is located in more than 75% within the National Park Los Haitises, reason why the municipality, according to the mayor, the pertinent authorities and MARENA support, shall remove the landfill and all contained waste from this area as soon as possible.



Source: Geographic Information System (GIS) of MARENA, 2016.

Figure 2 Location of the open-air municipal landfill

The installation of a sanitary landfill in the municipality is not yet planned, and waste is continued to be dumped in swampy land, generating a strong contamination of the waters that flow into the sea, where a large part of the population feeds on fish, shrimp and other species of marine fauna.

2.6.5 Organizational Aspects

Table 11 Tabla No.13: Personal de aseo y limpieza del ayuntamiento

PERSONNEL OF TOILET AND COLLECTION	No.
Toilet Supervisors	3
Staff sweeping and cleaning streets	76
Collection staff in collection units	18
Pickup truck drivers	7
Personnel at the landfill	3
TOTAL	107

Source: Municipal treasury department, city hall payroll (2016)

2.6.6 Education / awareness for the SWM

Currently the pilot project is being implemented in three communities, within the project activities, numerous talks are planned in schools, Community Council and NGOs of the municipality, with the aim of raising awareness of the importance of

appropriate management of solid waste in human health and in the preservation of the environment and natural resources.

2.6.7 Financial aspects for the ISWM

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

Table 12 City Council expenditure on municipal solid waste management.

VARIABLES	VALUES/MONTH	ANUAL
Maintenance costs of transportation equipment	98,000.00	1,176,000.00
Fuel costs for collection equipment	170,000.00	2,040,000.00
Decoration and sanitation of streets and squares	340,000.00	4,080,000.00
Solid Waste Management	260,000.00	3,120,000.00
Salaries and wages urban / rural cleaning staff	465,000.00	5,580,000.00
SUBTOTAL	1,333,000.00	15,996,000.00
Percentage of the city council budget	36%	36%
Collection budget for collection of garbage taxes to the citizens	0	0
Collections made by solid waste collection companies	40,000.00	480,000.00

Source: Department of Finance City Hall (2016)

2.6.8 Legal aspects

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. In addition, there are other laws and regulations that refer to the subject, such as Law 64-00 Environment and Natural Resources, non-hazardous solid waste regulation, municipal solid waste policy of the Ministry of Environment and Natural Resources, among other.

3 Assessment of the current situation and Identification of the fundamental problem of SWM

3.1 Identification and analysis of problems in the SWM

As part of the support activities during the development of the FOCIMIRS Project, the Problem Analysis Workshop was held in Sanchez on June 24, 2015, in which the community was invited to participate in the prioritization of critical problems. In summary, the results were as follows:

- a) Inefficiency in the collection of waste
- b) Little political will on the ISWM
- c) Municipal hazardous waste
- d) Deficiency in citizenship education
- e) Air pollution from the open-air landfill
- f) Lack of a financial plan

3.2 Strategic measures to be implemented

According to the problem defined with the community and the technicians of the Mayor's Office, the following list of basic activities was prepared to face the problems discussed:

Table 13 Problems and solution activities in solid waste management

Problems	Solution / activities
1. Strengthening public education	Promote lectures, orientations and other activities that are deemed necessary in order to raise public awareness about the recycling and management of R.S. (Effective packaging of waste, handling of medical waste, rotting waste, crystals, batteries, among others). Promote solid waste reuse activities that generate financial benefits. Separation and effective classification of solid waste by the municipality and other stakeholders.
2. The strengthening of the legal framework	Insuance of municipal ordinance that penalizes non-compliance with the law regarding the management of waste and / or waste.
4. Improvement of collection routes and frequencies	Establish appropriate routes and schedules for the collection of waste by the teams in charge.
3. Collection flotilla	Improve or replace the fleet of collection and transport of solid waste in the municipality.
4. Periodic review of staff health	Periodically examine the health of personnel directly involved in the management of solid waste.
5. Rehabilitation and improvement of the final disposal site	Relocation of the landfill where it does not mean a threat as a contaminating source of water and the environment. Establish and promote the construction of a landfill (under the aspect of the Municipal Association)
6. Implement payment of collection fees	Consider the possibility that the citizens pay a certain economic quota for an optimal collection of solid waste.

Source: Community meeting in the City Hall to establish problems and possible solutions, 2016.

4 Policy, objectives and conditions for the ISWM

4.1 Policy

The general goal of the ISWM is the improvement of the sanitary conditions of the municipality.

4.2 Objectives of the ISWM

The objectives of the ISWM have been established in different terms and for each component.

The period of execution of this plan is fifteen (15) years divided into three stages:

- a) Five (5) years: for the short-term plan.
- b) Ten (10) years: for the medium-term plan.
- c) Fifteen (15) years: for the long-term plan.

The ISWM plan will be reviewed and / or modified every two (2) years.

4.3 Planning Conditions

At a general level, the objective of the ISWM Plan is "to implement specific actions for the integral management of solid waste in the municipality of Sánchez, emphasizing the methodology of the 3R's, through the transfer of knowledge and experience acquired, achieving sustainable development through good practices and responsibilities, both at the community level and the municipality, with the solid waste generated at the source".

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 should be considered during the planning.

4.3.1 Quantity and composition of waste to be treated

Regarding the calculation of the future generation of waste, the current generation constant has been taken into account, as have the percentages of each component, so the following results have been obtained:

Table 14 Number of waste generated and to be treated in the municipality

Year	Population	Domestic		Recyclable	Organics	Others	Others Generators	Total
		Kg/day/Hab	Ton/Day				Ton/Day	Ton/Day
2010	26,509	0.59	27.4	33%	63%	4%	170	197.4
2011	26,509	0.59	27.4	33%	63%	4%	170	197.4
2012	26,509	0.59	27.4	33%	63%	4%	170	197.4
2013	26,509	0.59	27.4	33%	63%	4%	170	197.4
2014	26,509	0.59	27.4	33%	63%	4%	170	197.4
2015	26,509	0.59	27.4	33%	63%	4%	170	197.4
2016	26,509	0.59	27.4	33%	63%	4%	170	197.4
2017	26,509	0.59	27.4	33%	63%	4%	170	197.4
2018	26,509	0.59	27.4	33%	63%	4%	170	197.4
2019	26,509	0.59	27.4	33%	63%	4%	170	197.4
2020	26,509	0.59	27.4	33%	63%	4%	170	197.4
2021	26,509	0.59	27.4	33%	63%	4%	170	197.4
2022	26,509	0.59	27.4	33%	63%	4%	170	197.4
2023	26,509	0.59	27.4	33%	63%	4%	170	197.4
2224	26,509	0.59	27.4	33%	63%	4%	170	197.4
2025	26,509	0.59	27.4	33%	63%	4%	170	197.4
2026	26,509	0.59	27.4	33%	63%	4%	170	197.4
2027	26,509	0.59	27.4	33%	63%	4%	170	197.4
2028	26,509	0.59	27.4	33%	63%	4%	170	197.4
2029	26,509	0.59	27.4	33%	63%	4%	170	197.4
2030	26,509	0.59	27.4	33%	63%	4%	170	197.4
2031	26,509	0.59	27.4	33%	63%	4%	170	197.4

The following formula is applied under consideration of an annual per capita increase:

$$G_{pf} = G_{pa} + (1+r)^n$$

Donde:

G_{pf} = Future per capita generation (kg./hab./day)

G_{pa} = Current per capita generation (kg./hab./day)

r% = Increase rate of generation in% (from 0.5 to 1%) Jorge Jaramillo (2002).

N = Number of years

Assuming an annual rate of increase of 0% in GPC, the results would be as follows:

Table 15 Annual population increase per capita in the municipality

Year	Population	Domestic		Recyclable	Organics	Others	Others Generators	Total
		Kg/día/ Hab	Ton/Día				Ton/Día	Ton/Día
2015	26,509	0.59	27.4	33%	63%	4%	170	197.4
2016	26,509	0.59	27.4	33%	63%	4%	170	197.4
2017	26,509	0.59	27.4	33%	63%	4%	170	197.4
2018	26,509	0.59	27.4	33%	63%	4%	170	197.4
2019	26,509	0.59	27.4	33%	63%	4%	170	197.4
2020	26,509	0.59	27.4	33%	63%	4%	170	197.4
2021	26,509	0.59	27.4	33%	63%	4%	170	197.4
2022	26,509	0.59	27.4	33%	63%	4%	170	197.4
2023	26,509	0.59	27.4	33%	63%	4%	170	197.4
2224	26,509	0.59	27.4	33%	63%	4%	170	197.4
2025	26,509	0.59	27.4	33%	63%	4%	170	197.4
2026	26,509	0.59	27.4	33%	63%	4%	170	197.4
2027	26,509	0.59	27.4	33%	63%	4%	170	197.4
2028	26,509	0.59	27.4	33%	63%	4%	170	197.4
2029	26,509	0.59	27.4	33%	63%	4%	170	197.4
2030	26,509	0.59	27.4	33%	63%	4%	170	197.4
2031	26,509	0.59	27.4	33%	63%	4%	170	197.4

4.3.2 Implementation structure

The institution responsible for the execution of the ISWM is the Municipal Mayor of Sánchez, with a multidisciplinary team that includes personnel from different departments or areas that could be related in the management of solid waste: Ornate and Urban Sanitation, UGAM, Inspection Office of Works, Responsible for Participatory Budget, Department of Finance, Office of the Mayor.

The team will have the responsibility to establish the necessary coordination with other collaborating institutions in waste management, such as: Ministry of Environment and Natural Resources, Ministry of Education, Ministry of Public Health.

4.3.3 Legislation and organization

The inadequate management of solid waste in the municipality of Sánchez produces significant environmental impacts, hence the need to have a legal framework that regulates its management, in order to protect the health of the population and ensure the conservation of natural resources and the environment in general.

It is important to take into account that, as people advance, populations increase and, consequently, the need to create laws, norms and policies, which include fundamental actions for citizens to enjoy and enjoy rights that correspond to them, such as "right to a healthy environment", as contemplated in the Constitution of the Republic of 2010.

General Law 64-00 of Environment and Natural Resources, establishes the policies and regulations for the management of solid waste. This legislation contemplates that municipalities are responsible and competent for the management of municipal solid waste generated by the population.

The legal framework of this plan (ISWM) is embodied in different articles, paragraphs and paragraphs of the legal instruments indicated below:

- Constitution of the Republic.
- Law 218-84: which prohibits the introduction into the country, by any means, of human or animal excreta, household or municipal wastes and their derivatives, sludge or sewage sludge, treated or not, as well as toxic wastes from industrial processes.
- Law 83-89, in particular Art. 1, which prohibits the placing of construction, debris and waste in streets, sidewalks, avenues, roads and green areas, vacant lots, public plazas and gardens within urban areas and suburban areas of the Republic. Article 1.- Construction waste, debris and waste are placed in streets, sidewalks, avenues, roads and their margins, green areas, vacant lots, plazas and public gardens within the urban and suburban areas of the Republic.
- General Education Law 66-97
- Law 120-99: which prohibits any physical or moral person from throwing solid waste of any nature on streets, sidewalks, parks, roads, roads, seascapes, rivers, etc.
- General Law on Environment and Natural Resources 64-00, in particular articles 153, 106, 107 with its paragraphs and 108.
- General Law on Public Health and Social Assistance 42-01, in particular articles 7, 57 and 29 with their ordinals.
- Law 163-03 on Regime of Cooperation and Financial Assistance of the Executive Power to the city councils.
- Law 176-07, of the National District and Municipalities
- Law 1-12, National Development Strategy 2030
- Standard for Environmental Management of Non-Hazardous Solid Waste; NA-RS-

001-03 (Replaces the RE-DM-O1)

- Policy for the Integral Management of Municipal Solid Waste (GIRSM)
- The corresponding ordinances should be considered for the implementation of the plan

4.3.4 Target Area

The geographical area is the municipality of Sánchez, which is located in the province of Samaná, 160 km from Santo Domingo, in the Northeast region of the Dominican Republic.

According to the 2010 census, the political division of the urban center is in communities or sectors, as shown below:

Downtown: Composed by; Play abajo District, Play Arriba District, El Cangrejo, Los Rieles (La Línea), los Rieles Arriba (Hoja Ancha), La Plazoleta, Montenegro Uno, Monte Negro Dos, Mango Fresco, La Navaja, Cerros Chaljub, Los Camachos District, Barrio Chino, Villa Babosa, Callejón de Chang, Paseo de los Estudiantes, Matadero Viejo, Villa Liberación, Barrio Los Johnson.

Uptown: Composed by; Cumajom, Alta Mira, Los Kékere, El Hoyo, Los Morales, 27 de Febrero District, Cruce de Las Terrenas, Pajarito, La Torre, Colombia.

4.3.5 Cost of the ISWM Plan in Sánchez

For the implementation of the ISWM Plan, it is estimated that the costs of solid waste collection and disposal are the highest.

The results presented were calculated based on the expenses of each period, being 5 years the short term period, 6 to 10 years the medium term and 11 to 15 years in the long term.

The cost per investment plus the costs of maintenance and operation of collection of solid waste, is equal to 658.00 RD \$ / Ton, based on a formula taken from the Solid Waste Master Plan of Gran Santo Domingo, which corresponds to an applicable standard To municipalities like Sanchez.

The cost of final disposal for the construction of a joint sanitary landfill is of 1,369.00 RD \$ / ton and the unit cost for operation and maintenance is 893.00 RD \$ / t. This calculation was made taking as reference the cost of construction and the cost of

handling the operation of the final disposal site of the ASINORLU Municipal Association, in El Salvador, and which may well be applicable to the municipality of Sánchez, in case the landfill Joint sanitary is built in said municipality.

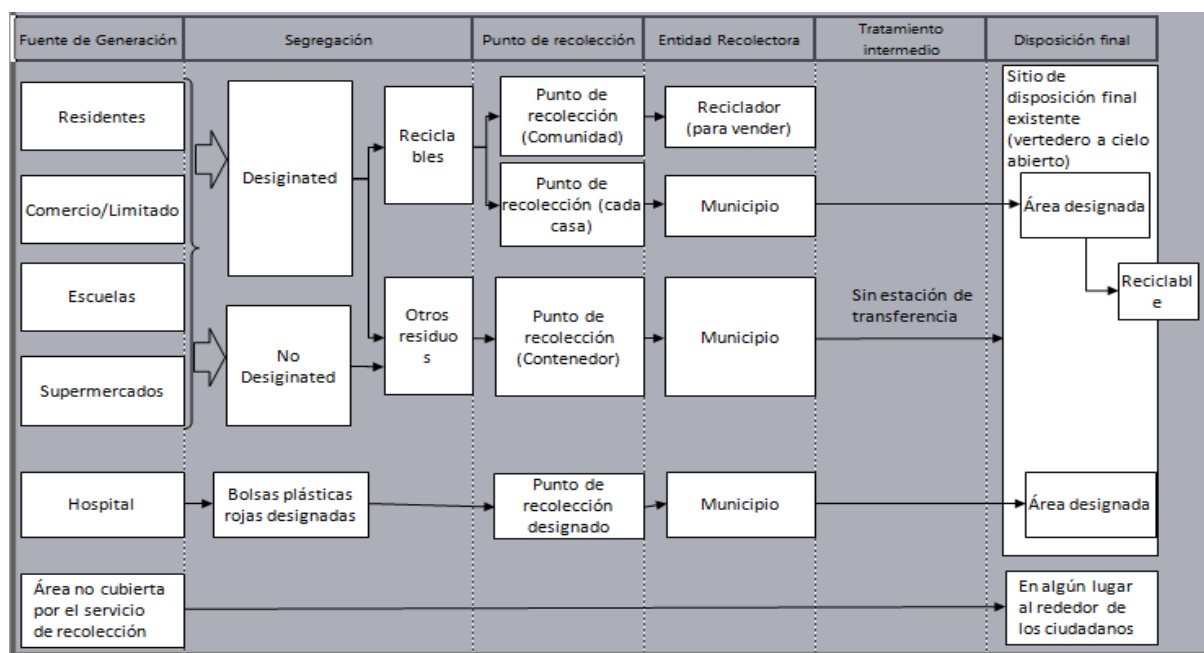
Table 16 Cost of final disposal with the construction of a sanitary landfill.-

No	Year	Hab	Amount of residues		Recolection		Relleno Sanitario		
					Investment and OM		Investment	OM	
			ton/day	ton/year	*1,000USD	*1,000USD			
1	2016	24,509	20.5	7,483	105	524	0		0
2	2017	24,509	20.5	7,483	105				
3	2018	24,509	20.5	7,483	105				
4	2019	24,509	20.5	7,483	105				
5	2020	24,509	20.5	7,483	105				
6	2021	24,509	20.5	7,483	105	524	4,153	142	711
7	2022	24,509	20.5	7,483	105			142	
8	2023	24,509	20.5	7,483	105			142	
9	2024	24,509	20.5	7,483	105			142	
10	2025	24,509	20.5	7,483	105			142	
11	2026	24,509	20.5	7,483	105	524	0	142	711
12	2027	24,509	20.5	7,483	105			142	
13	2028	24,509	20.5	7,483	105			142	
14	2029	24,509	20.5	7,483	105			142	
15	2030	24,509	20.5	7,483	105			142	

* The conditions for the calculations are: The start of the year of service of the new joint landfill - provincial will be in 2021. The useful life of the sanitary landfill will be of 15 years. Prices are in US \$ (* 1000 US).

5 Waste flow and Component Plans for each Phase

5.1 PHASE I: Short term - 0 TO 5 YEARS-



Source: JICA / MARENA / ADS Expert Team (2016).

Figure 3 Solid waste stream from 1 to 5 years for Sánchez.

General objective: Segregation of waste at the source and differentiated collection.

The specific objectives and activities for each component are as follows:

GENERATION / SEGREGATION:

Consensus to ensure that generators of hazardous waste (especially clinics and hospitals) are held responsible for them by properly managing them.

- a) Coordinate with the Mayor of Sanchez and the Ministry of the Environment the installation of containers destined exclusively to deposit the already separated and recyclable waste (on a voluntary basis) under the methodology of clean points, in such a way as to maintain the environment of the separation at source and families feel fully committed to the integral management of the waste they generate in their homes.

TEMPORARY STORAGE AND DELIVERY:

Promote the use of closed / rigid containers for delivery of these to the collection service on the established day and time.

To promote in all the families of the municipality of Sánchez, the separation of solid waste in the source of generation and good environmental practices, based on 3R.

COLLECTION AND TRANSPORTATION:

Maintain collection coverage at 95% throughout the municipality.

The program of waste collection routes will be redesigned by area throughout the municipality, in order to make collecting more effective.

COLLECTION AND TRANSPORT FLEET:

Starting in January 2017, the city council begins the replacement of the vehicle fleet for collection and transport of solid waste, acquiring the following units:

- 01- Truck collector or compactor of 08 cubic tons to cover the town center and the long routes to the rural area.
- 02- Collection trucks or backhoe loaders of 1.5 tons to cover the routes of narrower communities, which are a large majority in the municipality.
- 01-Dump truck of 2.8 cubic meters (Daihatsu or other brand) for the collection of debris in the urban helmet.
- 01- Dump truck of 06 cubic meters for the collection of pruning and other organic waste and maintenance of access roads to the different communities in both urban and rural areas.

INTERMEDIATE TREATMENT AND RECYCLING:

To establish minimum sanitary and organizational conditions for the recovery of materials by the existing divers, creating a functional structure (registration of the same, organization as a recycling force).

Promote and facilitate the communication and relations between divers and those companies that act as intermediaries for the acquisition of recyclable materials.

Promote the increase in the recovery of recyclable materials.

Registration of persons engaged in voluntary and commercial activities for the collection of recoverable waste; With the purpose of maintaining a control over the force that counts the municipality that carry out these activities.

Properly register, companies or businesses that are engaged in the acquisition of metallic waste, calamine, copper, plastics, electronics, batteries, among others, in such a way that the collection becomes an economic activity for groups focused in the municipality of Sánchez.

FINAL DISPOSAL:

Improve the conditions of the current landfill, through the intervention of this using the necessary equipment and techniques.

MAINTENANCE: To give the proper maintenance of the final disposal site, the municipality will acquire the necessary equipment, as follows:

01- Mechanical Shovel

01- Gredar

01- Bulldozer

REHABILITATION: The city council will try to carry out the rehabilitation of the current site of final disposal, to extend the useful life, at least another five years.

COUNTERMEASURES: With regard to the current location, the city council will take the necessary steps, requesting the non-objection of the Ministry of Environment and Natural Resources (MARENA), to continue using this area as a municipal landfill, until the construction of the landfill Provincial health.

SANITARY FILLING: It is imperative, the construction of a provincial sanitary landfill, that allows a better final disposition of the solid waste, in compliance with law 176-07 and with the Constitution of the Republic, and the general law of environment and natural resources No.64-00, among other adjectives.

In the current landfill area, mile three (03), it is proposed to **construct a collection area for separated and classified waste**, which can be exploited; To recondition that landfill, so that it can function as a controlled landfill, that can handle the emission of greenhouse gases and leachate.

- a) Promote the gradual disappearance of improvised and illegal landfills throughout the municipality including the town center and the countryside.
- b) Elaborate a plan that includes the design and construction of a sanitary landfill for the deposit of the residues of the joint municipalities.
- c) Infrastructure / conditioning of the access road to the final disposal site.
- d) The ISWM plan will be presented to other institutions, which are in the capacity and willingness to collaborate so that it is feasible, especially in the acquisition of equipment and construction of the provincial sanitary landfill.

CITIZEN EDUCATION AND PUBLIC CONSENSUS:

Promote participation and commitment to the municipality with the actions to be implemented.

Activities:

- a) To carry out permanent campaigns of sensitization and awareness towards the ISWM.
- b) Establish alliances with local media to raise awareness of the citizens to the proper management of solid waste.
- c) Formation of the team responsible for education and public consensus, with participation of key stakeholders of the municipality.
- d) Training of ISWM leaders and promoters.
- e) To hold different talks, workshops, conferences and on-site practices, to the community meetings, schools of District 14-05, among other institutions representative of the living forces of the municipality of Sánchez, with the aim

of integrating and raising the awareness of families to the project of Integral Management of Solid Waste through the methodology of the 3R's.

FINANCIAL MANAGEMENT:

To improve the revenue of the city council for the collection of the services of collection, transport and final disposal to the users.

Activities:

- a) Prepare a financial plan in ISWM.
- b) To elaborate a system of rates and charge of the service of domiciliary collection by socioeconomic quintile.
- c) To elaborate a system of rates and charge of the collection service to the stores.
- d) Establish rates for the final disposal of waste not included in the collection and transport service of the city council.

LEGAL ASPECTS:

Objective: To create the necessary legal basis in the municipality to guarantee the execution of the plan (ISWM).

Activities:

- a) Dissemination and awareness to the community of existing legal provisions regarding solid waste management.
- b) To elaborate the necessary legal instruments to guarantee the execution of the ISWM.

Table 17 Budget projected to five (05) years

VARIABLE	2016 RD\$	2017 RD\$	2018 RD\$	2019 RD\$	2020 RD\$
INCOMES:					
Business waste collection	480,000.00	720,000.00	720,000.00	720,000.00	720,000.00
Domestic waste collection	0	0	0	0	0
EXPENSES:					
Maintenance and repair	350,000.00	350,000.00	350,000.00	350,000.00	350,000.00
Fuels and lubricants	2,050,000.00	2,050,000.00	2,050,000.00	2,050,000.00	2,050,000.00
Staff: Drivers, Assistants, Supervisors, Enc. cleaning	5,200,800.00	5,200,800.00	5,200,800.00	5,200,800.00	5,200,800.00
Maintenance Final Disposal Site	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00
Purchase collection equipment	Quote	Quote	Quote	Quote	Quote
Purchase disposal equipment from the final disposal site		Quote	Quote	Quote	Quote
Purchase of 50 plastic containers to place in strategic places for the collection	Quote	Quote	Quote	Quote	Quote
Intermediate treatment	Activities	Activities	Activities	Activities	Activities
Education (ISWM): Talks, workshops	13,000.00	44,200.00	44,200.00	44,200.00	44,200.00
Advertising (ISWM)	32,000.00	78,000.00	78,000.00	78,000.00	78,000.00
Installation of Recyclable Containers (ISWM) - Manage	-	-	-	-	-

Source: Municipal budget made to run from 2017.

With respect to the collection of solid corporate waste, will make the municipal proposal to submit it in 2017 to the Council of Regents in the Chapter Room, in such a way that there is consensus regarding the collection policies of the tax and its application for this concept.

Regarding the collection of household waste, these will continue to be collected during the years 2016 to 2020 without cost to families, so that we can focus on consolidating collection and collection in the business and institutional line. This is

because there is an agreement signed with the company EDENORTE, in such a way that it is billed and charged a fixed fee for the collection of waste for all inhabitants.

Intermediate treatment: From 2019 to 2021, a training program will be implemented for families regarding domestic composting, so that the volume of organic waste that is taken to the final disposal site can be significantly reduced.

Maintenance of the final disposal site: In this area, the activities consist of improving the conditions of the path to the final disposal site, using machinery and equipment intended for that purpose (grit and shovel), So that every two times a year can be guaranteed the viability for handling and disposal of waste in general. This includes channeling access roads to the final disposal site, removal and coverage of organic waste, and by 2018 recanalization with leachate channels, generated by organic waste, in a way that can reduce its effects in the waters that flow into the sea and thereby reduce the negative effects on climate change.

Education: In this budget line will be developed various activities according to the following table:

Table 18 Projected Activities (2017)

Period	Actividad
January-March 2017	a) Census application in extension areas of the ISWM project b) Submit requests for collection and transport equipment to other public or private institutions.
April -June 2017	a) Start a training program for families in extension areas: Play Arriba community, Camachos and Chaljub Hills: In the month of April will begin the talks in the Play Up sector on awareness of solid waste management Treatment. In that month two talks will be held. b) During the period May-June 2017, there will be two further talks and orientation workshop on solid waste management. c) During the period from May to June 2017, four (04) containers will be installed in the Play Arriba sector, as clean points for the disposal of recyclable waste by the community.
June-August, 2017	a) Start a training program for families in extension areas: Los Camachos community: In the month of June, two talks will be held in the Los Camachos community about awareness of the management of domestic solid waste and its management. b) During the period June-July 2017, there will be three talks and orientation workshop on solid waste management. c) During the period from July to August 2017, three (03) containers will be installed in the Los Camachos community, as clean points for the disposal of recyclable waste by the community.
September-December, 2017	a) Start of training program for families in extension areas: Chaljub Hills: In September, two talks will be held in Los Cerros de Chaljub

Period	Actividad
	<p>on awareness of the management of domestic solid waste and its treatment.</p> <p>b) In the period October-November 2017, there will be three talks and an orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2017, three (03) containers will be installed in Los Cerros de Chaljub, as clean points for the disposal of recyclable waste by the community.</p> <p>d) Between January and April 2017, the collection routes will be reorganized in the municipality, especially in the urban area, which is expected to achieve greater efficiency in the collection and streamline each process in the different sectors.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 19 Cost of activities (2017)

Period	Activity	Cost / budget RD\$
January-March 2017	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 04 Containers	58,300.00
June	02-Talks	6,314.28
June July	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 03 Containers	44,250.00
Year 2017	Advertising- Paloma FM 103.9	34,000.00
Year 2017	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 20 Projected Activities (2018)

Period	Activity
January-March 2018	a) Census application in extension areas of the ISWM project.
April -June 2018	<p>a) Start a training program for families in extension areas: Mango Fresco, Chinatown, Villa Babosa: In April, the talks will begin in the Mango Fresco sector on awareness of the management and treatment of domestic solid waste. In that month two talks will be held.</p> <p>b) During the period May-June 2018, there will be two further talks and orientation workshop on solid waste management.</p> <p>c) During the period from May to June 2018, four (04) containers will be installed in the Mango Fresco sector, as clean points for the disposal of recyclable waste by the community.</p>

Period	Activity
June-August, 2018	<p>a) Start a training program for families in extension areas: Mango Fresco: In the month of June two talks will be held in Barrio Mango Fresco about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2018, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from July to August 2018, three (03) containers will be installed in the Barrio Mango Fresco, as clean points for the disposal of recyclable waste by the community.</p>
September-December, 2018	<p>a) Start a training program for families in extension zones: Chinatown: In September, two talks will be held in Chinatown on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2018, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2018, four (04) containers will be installed in the Chinatown, as clean points for the disposal of recyclable waste by the community.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 21 Cost of activities (2018)

Period	Activity	Cost / budget RD\$
January-March 2018	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 04 Containers	58,300.00
	02-Talks	6,314.28
June	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 03 Containers	44,250.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 22 Projected Activities (2019)

Period	Actividad
January-March 2019	a) Census application in extension areas of the ISWM project.
April -June 2019	a) Start a training program for families in extension areas: Barrio Villa Babosa: In the month of April will start talks in the community Villa Babosa on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.

Period	Actividad
	<p>b) During the period May-June 2019, there will be two further talks and orientation workshop on solid waste management.</p> <p>c) During the period from May to June 2019, two (02) containers will be installed in Barrio Villa Babosa, as clean points for the disposal of recyclable waste by the community.</p>
June-August, 2019	<p>a) Start a training program for families in extension areas: Monte Negro District 1, Montenegro 2 and Villa Liberation Sector: In the month of June two talks will be held in the Barrio Monte Negro 1 on awareness of the management of Solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2018, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from July to August 2019, two (02) containers will be installed in the Barrio Monte Negro 1, as clean points for the disposal of recyclable waste by the community.</p>
September-December, 2019	<p>a) Start a training program for families in extension areas: Montenegro 2: In September two talks will be held in Montenegro 2, on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2019, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2019, two (02) containers will be installed in the Montenegro 2 sector, as clean points for the disposal of recyclable waste by the community.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 23 Cost of activities (2019)

Period	Activity	Cost / budget RD\$
January-March 2019	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 04 Containers	58,300.00
June	02-Talks	6,314.28
June	03-Talks	9,471.42
July	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 03 Containers	44,250.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 24 Projected Activities (2020)

Period	Activity
January-March (2020)	a) Census application in extension areas of the ISWM project.
April -June 2020	<p>a) Start a training program for families in extension areas: Villa Liberation Sector: In the month of April will begin the talks in the Villa Liberation sector on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2020, there will be two further talks and orientation workshop on solid waste management.</p> <p>c) During the period from May to June 2020, four (04) containers will be installed in the Villa Liberation Sector, as clean points for the disposal of recyclable waste by the community.</p>
June-August, 2020	<p>a) Start training program for families in extension areas: Barrio La Plazoleta. In the month of June will be held two talks in the Barrio La Plazoleta on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2020, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from July to August 2020, three (03) containers will be installed in the Barrio La Plazoleta, as clean points for the disposal of recyclable waste by the community.</p>
September-December, 2020	<p>a) Start of a training program for families in extension zones: Prolongación Duarte and Correo Viejo: In September, two talks will be held in Prolongación Duarte and Correo Viejo on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2020, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2020, two (02) containers will be installed in Prolongación Duarte and Correo Viejo, as clean points for the disposal of recyclable waste by the community.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 25 Cost of activities (2020)

Period	Activity	Cost / budget RD\$
January-March (2020)	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 04 Containers	58,300.00
June	02-Talks	6,314.28
June	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28

Period	Activity	Cost / budget RD\$
October November	03-Talks	9,471.42
November December	Installation 03 Containers	44,250.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

INSTITUTIONAL AND ORGANIZATIONAL ASPECTS:

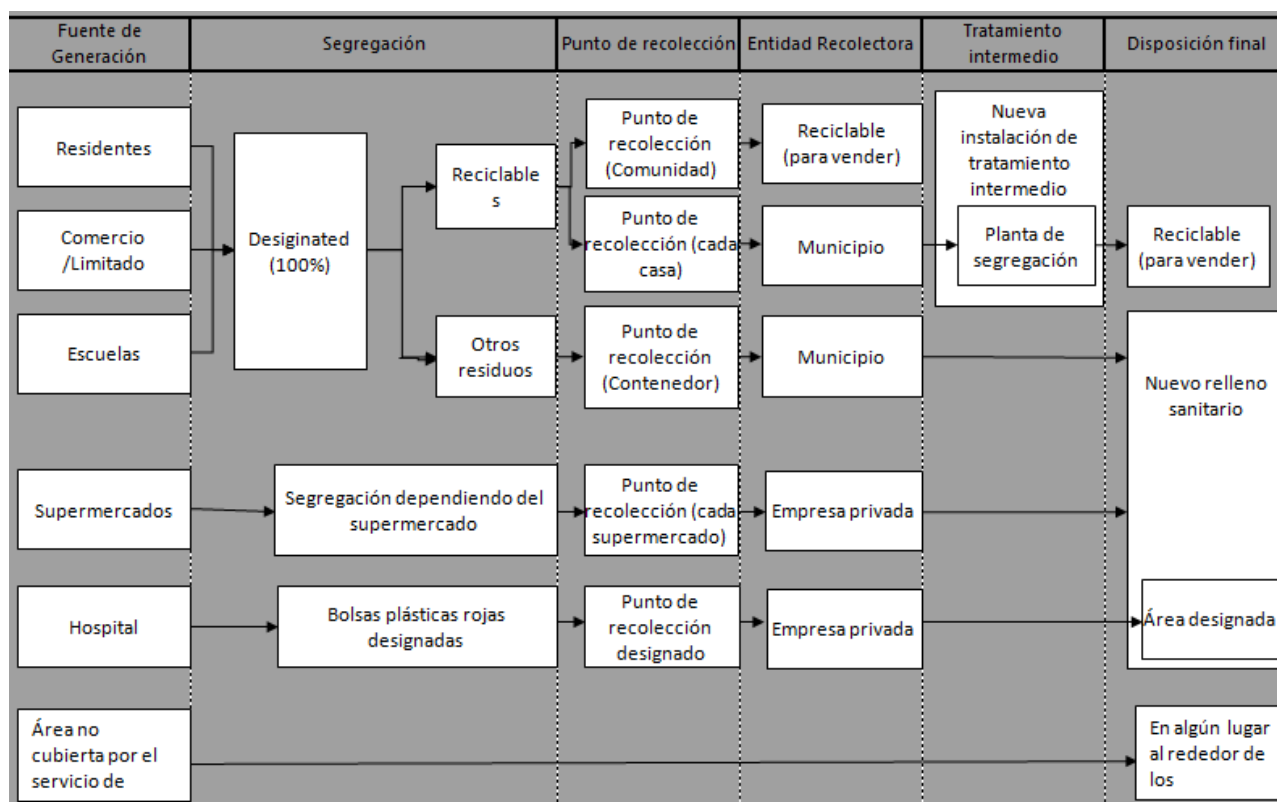
Improve the institutional capacity for the implementation of the ISWM and ensure the adequacy of the organizational structure according to the requirements of the ISWM.

Activities:

- a) Form the team responsible for implementing the ISWM.
- b) To elaborate proposals of training of the teams that work in the ISWM.

5.2 PHASE II: Medium term - 5 to 10 years-

Course objective: Continue the practices of separation of solid waste in the generation source, in each of its components.



Source: JICA / MARENA / ADS Expert Team (2016).

Figure 4 Municipal solid waste stream for 10 years in Sánchez

The specific objectives and activities for each component are as follows:

COLLECTION AND TRANSPORTATION:

It is planned to maintain or even improve the current collection frequency (from 5.5 to 6 times per week in the urban area, and from 2 to 3 or more times for the rural area), maintaining this rate uninterruptedly given an optimal maintenance of the vehicles and tools needed for this activity. The separation area at the source will be expanded throughout the municipality.

CITIZEN EDUCATION AND PUBLIC CONSENSUS:

- Establish collection points in the different communities.
- Improve the sweeping of the streets.

- c. To carry out segregation of organic and inorganic waste in the source of generation, in the business, commercial, institutional, and family area.
- d. To promote the development of a family composting program, through national or international cooperation technical assistance.
- e. Raise awareness of the importance of applying the 3Rs methodology.

FINAL DISPOSAL

- a. Reduce 15% of the waste that reaches the final disposal point.
- b. Perform a formal registration of divers from the landfill and urban waste collectors.
- c. Seek the construction of a solid waste collection center in the area of the municipal landfill for the recovery of waste that is not separated in households, companies and institutions.
- d. Execute the necessary actions and parameters for the transfer of the landfill from its current location (which is confirmed within the Los Haitises National Park) to a place that either represents a biological hazard or violates environmental laws.
- e. Operate the final disposal site jointly with the other municipalities and municipal districts of the province, through a specialized administrative structure for this purpose.

Activities:

Continue the training of new promoters / leaders regarding ISWM.

FINANCIAL MANAGEMENT:

- a. Maintain coherence in the sustainability of the ISWM through the efficient collection of collection services at the municipal level.
- b. Elaborate the financial plan to achieve a sustainable ISWM.

Table 26 Budget (2021-2025)

VARIABLE	2021 RD\$	2022 RD\$	2023 RD\$	2024 RD\$	2025 RD\$
INCOME:					
Business waste collection	720,000.00	720,000.00	720,000.00	720,000.00	720,000.00
Domestic waste collection	0	0	0	0	0
EXPENSES:					
Maintenance and repair	350,000.00	350,000.00	350,000.00	350,000.00	350,000.00
Fuels and lubricants	2,050,000.00	2,050,000.00	2,050,000.00	2,050,000.00	2,050,000.00
Staff: Drivers, assistants, supervisors, enc. cleaning	5,200,800.00	5,200,800.00	5,200,800.00	5,200,800.00	5,200,800.00
Maintenance Final Disposal Site	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00
Provincial sanitary landfill	N/A	N/A	N/A	N/A	N/A
Education (ISWM): Talks, workshops	44,200.00	44,200.00	44,200.00	44,200.00	44,200.00
Advertising (ISWM)	78,000.00	78,000.00	78,000.00	78,000.00	78,000.00
Installation of recyclable containers (ISWM)	145,750.00	145,750.00	145,750.00	145,750.00	145,750.00

Source: Municipal budget authorized to be executed from 2017.

Regarding the collection of domestic waste, these will continue to be collected during the years 2021 to 2025, so that we can focus on consolidating collection and charge in the business and institutional line. This is because there is an agreement signed with the company EDENORTE, in such a way that it is billed and charged a fixed fee for the collection of waste for all inhabitants.

Maintenance of the final disposal site: In this area, the activities consist of improving the conditions of the path to the final disposal site, using machinery and equipment intended for that purpose (grit and shovel), so that twice a year the viability for the handling and disposal of waste in general can be guaranteed. This includes channeling access roads to the final disposal site, removing and covering

organic waste, and continuing the recanalization with leachate channels, generated by organic waste, in a way that can reduce its effects on the waters which flow into the sea and thereby also reduce the negative effects on climate change.

Intermediate treatment: From the year 2021 the training program for families regarding domestic composting will continue, in such a way that the volume of organic waste that is taken to the final disposal site can be significantly reduced.

Education: In this budget line will be developed various activities according to the following table:

Table 27 Projected Activities (2021)

Period	Activity
January-March (2021)	a) Census application in extension areas of the ISWM project
April -June 2021	a) Start of a training program for families in extension areas: Barrio matadero Viejo and Paseo de los Estudiantes: In April, discussions will begin in the Matadero Viejo community about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period May-June 2021, there will be two further talks and orientation workshop on solid waste management. c) During the period from May to June 2021, four (02) containers will be installed in Barrio Abasto Viejo, as clean points for the disposal of recyclable waste by the community.
June-August, 2021	a) Start of training program for families in extension areas: Paseo de Los Estudiantes: In the month of June talks will be held on Paseo de Los Estudiantes on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period June-July 2021, there will be three talks and orientation workshop on solid waste management. c) During the period from July to August 2021, three (02) containers will be installed on the Paseo de Los Estudiantes, as clean points for the disposal of recyclable waste by the community.
September-December, 2021	a) Start a training program for families in extension areas: Cecilia Residential: In September, talks will be held at the Cecilia Residential on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period October-November 2021, there will be three talks and orientation workshop on solid waste management. c) During the period from November to December 2021, three (06) containers will be installed in the Residencial Cecilia, as clean points for the disposal of recyclable waste by the community.

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 28 Cost of activities (2021)

Period	Activity	Cost / budget RD\$
January-March (2021)	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 02 Containers	29,500.00
June	02-Talks	6,314.28
June	03-Talks	9,471.42
July	Installation 02 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 06 Containers	88,500.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 29 Projected Activities (2022)

Period	Activity
January-March (2022)	a) Census application in extension areas of the ISWM project.
April -June 2022	<p>a) Start of a training program for families in extension areas: Altamira, Cumajom, Los Morales: In April, the talks will begin in the Altamira sector on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2022, there will be two further talks and orientation workshop on solid waste management.</p> <p>c) During the period from May to June 2022, four (04) containers will be installed in the Altamira sector, as clean points for the disposal of recyclable waste by the community.</p>
June-August, 2022	<p>a) Start a training program for families in extension areas: Cumajom community: In the month of June there will be talks in Cumajom about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2022, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from July to August 2022, a (01) container will be installed in the Barrio Mango Fresco, as clean points for the disposal of recyclable waste by the community.</p>
September-December, 2022	<p>a) Start training program for families in extension areas: Los Morales Sector: In September, talks will be held in the Los Morales Sector on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2022, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2022, two (02)</p>

	containers will be installed in the Los Morales sector, as clean points for the disposal of recyclable waste by the community.
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Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 30 Cost of activities (2022)

Period	Activity	Cost / budget RD\$
January-March (2022)	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 04 Containers	59,000.00
June	02-Talks	6,314.28
June	03-Talks	9,471.42
July	Installation 01 Container	14,750.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 02 Containers	29,500.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 31 Projected Activities (2023)

Período	Actividad
January-March (2023)	a) Census application in extension areas of the ISWM project.
April -June 2023	<p>a) Start of training program for families in extension areas: Detrás del Hospital: In the month of April will start talks in the community Detrás del Hospital about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2023, there will be two further talks and orientation workshop on solid waste management.</p> <p>c) During the period from May to June 2023, two (04) containers will be installed in the community Behind the Hospital, as clean points for the disposal of recyclable waste by the community.</p>
June-August, 2023	<p>a) Start of a training program for families in extension areas: Barrio 27 de Febrero, 16 de Agosto: In the month of June there will be talks on February 27th on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2023, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from July to August 2023, two (02) containers will be installed in Barrio 27 de Febrero, as clean points for the disposal of recyclable waste by the community.</p>
September-	a) Start a training program for families in extension zones: 16 de

Período	Actividad
December, 2023	<p>Agosto zone and its environment: In September, there will be talks in the 16 de Agosto zone and its environment, on awareness of solid waste management Treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2023, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2023, two (04) containers will be installed in the 16 August zone and its surroundings, as clean points for the disposal of recyclable waste by the community.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 32 Cost of activities (2023)

Period	Activity	Cost / budget RD\$
January-March (2023)	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May	Installation 04 Containers	59,000.00
June	02-Talks	6,314.28
June	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October	03-Talks	9,471.42
November December	Installation 04 Containers	59,000.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 33 Projected Activities (2024)

Period	Activity
Enero-marzo (2024)	a) Census application in extension areas of the ISWM project.
Abril –junio 2024	<p>a) Start of a training program for families in extension areas: Barrio La Torre: In the month of April will begin talks in the Barrio La Torre about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2024, there will be two further talks and orientation workshop on solid waste management.</p> <p>c) During the period from May to June 2024, four (02) containers will be installed in La Torre community, as clean points for the disposal of recyclable waste by the community.</p>

Period	Activity
Junio-agosto, 2024	a) Start of a training program for families in extension areas: Barrio de Rey Fernández. In the month of June talks will be held in the Barrio Rey Fernandez on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period June-July 2024, there will be three talks and orientation workshop on solid waste management. c) During the period from July to August 2024, three (03) containers will be installed in the Barrio de Rey Fernández, as clean points for the disposal of recyclable waste by the community.
Septiembre-Diciembre, 2024	a) Start of a training program for families in extension areas: Resto Pueblo Arriba: In September, talks will be held in Resto Pueblo Arriba on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period October-November 2024, there will be three talks and orientation workshop on solid waste management. c) During the period from November to December 2024, two (02) containers will be installed in Resto Pueblo Arriba, as clean points for the disposal of recyclable waste by the community.

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 34 Cost of activities (2024)

Period	Activity	Cost / budget RD\$
January-March (2024)	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
May June	Installation 02 Containers	29,500.00
June	02-Talks	6,314.28
July	03-Talks	9,471.42
August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 02 Containers	29,500.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 35 Projected Activities (2025)

Period	Activity
January-March (2025)	a) Census application in extension areas of the ISWM project.

Period	Activity
April -June 2025	<p>a) Start a training program for families in extension areas: Village center (Luperón, Mella, Santomé, Uruguay, Father Billini): In April, the talks will begin at the village center (Luperón, Mella , Santomé, Uruguay, Father Billini) on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2025, there will be two further talks and orientation workshop on solid waste management.</p>
June-August, 2025	<p>a) Continuation of the training program for families in extension areas: Village center (Luperón, Mella, Santomé, Uruguay, Father Billini).</p> <p>b) In the period June-July 2025, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from July to August 2025, three (03) containers will be installed in the village center (Luperón, Mella, Santomé, Uruguay, Padre Billini) as clean points for the disposal of recyclable waste by the community .</p>
September-December, 2025	<p>a) Continuation of the training program for families in extension areas: Village center (Trina de Moya Arriba, Carmela Shephard, Libertad): In the month of September two talks will be held in the town center (Trina de Moya Arriba , Carmela Shephard, Libertad) on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2025, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period of November will continue the program of awareness to the families on the management of solid waste.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 36 Cost of activities (2025)

Period	Activity	Cost / budget RD\$
January-March (2025)	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
June	02-Talks	6,314.28
July	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

LEGAL ASPECTS:

- a. To promote before the Capitular Hall, the proposal of a municipal ordinance for the creation of a system of payments for the service of collection, as much to the commercial sector, as institutional and familiar.
- b. Constantly review existing regulations under the ISWM. At least every two years.
- c. Promote new ordinances or resolutions in the Chapter Chamber given the need for the plan.

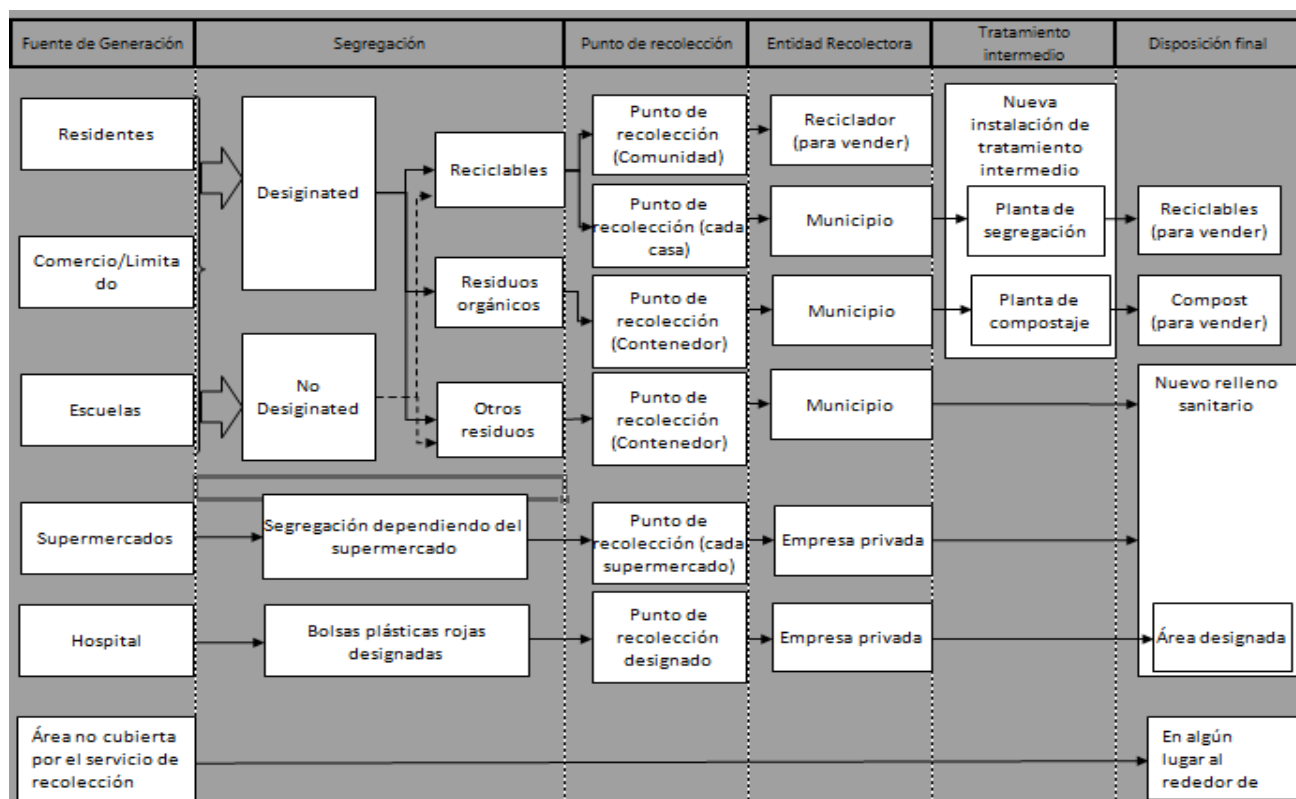
ORGANIZATIONAL AND INSTITUTIONAL ASPECTS:

Strengthen institutional capacity for the implementation and sustainability of ISWM.

Seek the functionality of the team responsible for the ISWM and the areas or departments involved.

5.3 PHASE III: Long term - 10 to 15 years-

General objective: to establish an intersectoral alliance with the living forces of the municipality, to actively develop the daily practice of domestic composting, through the promotion of cultural change and accountability to ISWM.



Source: JICA / MARENA / ADS Expert Team (2016).

Figure 5 Waste stream from 2025-2030.

The specific objectives and activities for each component are as follows:

GENERATION AND SEGREGATION:

To carry out the segregation in all the households of the municipality in three sources: organic, recyclable and others.

COLLECTION AND TRANSPORTATION:

- Maintain the collection of waste in 95% of the municipality, both domestic, urban and business and institutional.
- Establish the program of selective collection by type of waste per day and route.

INTERMEDIATE TREATMENT AND RECYCLING:

- a. Elimination to 100% clandestine dumps existing in the municipality.
- b. Contribute to the improvement of economic, social and environmental conditions.
- c. To promote the improvement of human health.

FINAL DISPOSAL:

- a. Make an intervention to improve the conditions of the landfill and try to turn it into a mini sanitary landfill that gives fundamental coverage to the amount of waste that could go to it. (If the landfill has already been constructed, this section should disappear from the plan).
- b. Reduce the volume of waste that goes to the disposal site.
- c. To promote in a diplomatic, harmonious and peaceful manner the creation of a community for the treatment of waste in all its classifications, between Sánchez, Las Terrenas, El Limón and Samaná.
- d. Biomedical or hospital waste shall be segregated from domestic, business, institutional and industrial waste and classified as hazardous by placing it in special containers and bags of high strength and impermeability, preferably red, as well as creating an exclusive and designated area to treat these residues in the landfill. (In this regard, the necessary steps will be taken for the Ministry of Public Health to procure the collection of such waste in special units).

CITIZEN EDUCATION AND PUBLIC CONSENSUS:

Strengthen the participation and commitment of citizens with respect to activities and actions under the practice of 3Rs culture.

FINANCIAL MANAGEMENT:

- a. Ensure that the sustainable execution of the ISWM is maintained.
- b. Elaborate and execute the financial plan.

Table 37 Budget 2025-2030

VARIABLE	2026 RD\$	2027 RD\$	2028 RD\$	2029 RD\$	2030 RD\$
INCOME:					
Business waste collection	720,000.00	720,000.00	720,000.00	720,000.00	720,000.00
Domestic waste collection	0	0	0	0	0
EXPENSES:					
Maintenance and repair	350,000.00	350,000.00	350,000.00	350,000.00	350,000.00
Fuels and lubricants	2,050,000.00	2,050,000.00	2,050,000.00	2,050,000.00	2,050,000.00
Staff: Drivers, Assistants, Supervisors, Enc. cleaning	5,200,800.00	5,200,800.00	5,200,800.00	5,200,800.00	5,200,800.00
Maintenance Final Disposal Site	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00
Provincial sanitary landfill	N/A	N/A	N/A	N/A	N/A
Education (ISWM): Talks, workshops	44,200.00	44,200.00	44,200.00	44,200.00	44,200.00
Advertising (ISWM)	78,000.00	78,000.00	78,000.00	78,000.00	78,000.00
Installation of recyclable containers (ISWM)	145,750.00	145,750.00	145,750.00	145,750.00	145,750.00

Source: Municipal budget authorized to enter into execution from 2017.

Regarding the collection of domestic waste collection, these will continue to be collected during the years 2021 to 2025 at no cost to families, so that we can focus on consolidating collection and charging in the business and institutional line. This is due to the fact that there is an agreement signed with the company EDENORTE, in such a way that it is billed and charged a fixed fee for the collection of waste for all inhabitants.

Maintenance of the final disposal site: In this area, the activities consist of improving the conditions of the path to the final disposal site, using machinery and equipment intended for that purpose (grit and shovel) twice per year, to ensure the viability of waste disposal in general. This includes channeling the access roads to

the final disposal site, removing and covering organic waste, and continuing the recanalization with leachate channels, generated by organic waste, in order to reduce its effects on the waters that flow at sea.

Intermediate treatment: From the year 2021 the training program for families regarding domestic composting will continue, in order to significantly reduce the volume of organic waste that are taken to the final disposal site.

Education: In this budget line will be developed various activities according to the following table:

Table 38 Projected Activities (2026)

Period	Activity
January-March 2026	a) Census application in extension areas of the ISWM project
April -June 2026	<p>a) Start training program for families in extension areas: Barrio Narin (behind the Santome), Barrio de Chulo, Tower of Orange: In the month of April will begin talks in the community of Narin, on awareness in terms of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2026, there will be two further talks and orientation workshop on solid waste management.</p>
June-August, 2026	<p>a) Start a training program for families in extension areas: Callejón de Chulo: In the month of June there will be talks on the Students' Walk about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period June-July 2026, there will be three talks and orientation workshop on solid waste management.</p>
September-December, 2026	<p>a) Start training program for families in extension areas: Antena Orange District: In the month of September there will be talks in the Orange District about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2026, there will be three talks and orientation workshop on solid waste management.</p> <p>c) During the period from November to December 2026, one (01) container will be installed in the Antena Barrio de Orange, as a clean point for the disposal of recyclable waste by the community.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 39 Cost of activities (2026)

Period	Activity	Cost / budget RD\$
January March	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
June	02-Talks	6,314.28
July	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 01 Container	14,750.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 40 Projected Activities (2027)

Period	Activity
January-March 2027	a) Census application in extension areas of the ISWM project.
April -June 2027	a) Start a training program for families in extension areas: Rivas, Gastón Deligne, Salomé Ureña: In the month of April the talks in the sectors Gastón Deligne, Rivas and Salomé Ureña on awareness of the management of Solid waste and its treatment. In that month two talks will be held. b) During the period May-June 2027, there will be two further talks and orientation workshop on solid waste management.
June-August, 2027	a) Start a training program for families in rural areas: El Catey Project: In the month of June, the Catey Project will be held on awareness raising about the management of domestic solid waste and its treatment . In that month two talks will be held. b) In the period June-July 2027, there will be three talks and orientation workshop on solid waste management.
September-December, 2027	a) Start of a training program for families in extension areas: Catey Outside: In September, there will be talks in the Catey Outside Sector about awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period October-November 2027, there will be three talks and orientation workshop on solid waste management.

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 41 Cost of activities (2027)

Period	Activity	Cost / budget RD\$
January March	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
June,	02-Talks	6,314.28
July	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 01 Containers	14,750.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 42 Projected Activities (2028)

Period	Activity
January-March (2028)	a) Census application in extension areas of the ISWM project.
April -June 2028	<p>a) Start a training program for families in extension areas: El Arenazo: In April, the talks in El Arenazo will begin on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) During the period May-June 2027, two talks and orientation workshop on solid waste management will be held.</p>
June-August, 2028	<p>a) Start a training program for families in extension areas: Majagua Inside and outside: In the month of June there will be talks in Majagua Inside and outside on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2028, there will be three talks and orientation workshop on solid waste management.</p>
September-December, 2028	<p>a) Start of a training program for families in extension zones: El Chicharrón and Aguas Buenas zone: In September two talks will be held in El Chicharrón and Aguas Buenas, on awareness of the management of domestic solid waste and Your treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2028, there will be three talks and orientation workshop on solid waste management.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 43 Cost of activities (2028)

Period	Activity	Cost / budget RD\$
January March	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
June	02-Talks	6,314.28
July	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 01 Containers	14,750.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 44 Projected Activities (2029)

Period	Activity
January-March (2029)	a) Census application in extension areas of the ISWM project.
April -June 2029	<p>a) Start training program for families in extension areas: Los Mangos: In April, talks will begin in Los Mangos on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period May-June 2029, two talks and orientation workshop on solid waste management will be held.</p>
June-August, 2029	<p>a) Start a training program for families in extension areas: Pajarito and Punta Gorda. In the month of June will be held two talks in Pajarito and Punta Gorda on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period June-July 2029, there will be three talks and orientation workshop on solid waste management.</p>
September-December, 2029	<p>a) Start a training program for families in extension areas: Arroyo Higüero and Santa Capuza: In September, talks will be held in Resto Pueblo Arriba on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held.</p> <p>b) In the period October-November 2029, there will be three talks and orientation workshop on solid waste management.</p>

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 45 Cost of activities (2029)

Period	Activity	Cost / budget RD\$
January March	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
June	02-Talks	6,314.28
July	03-Talks	9,471.42
July August	Installation 03 Containers	44,250.00
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
November December	Installation 01 Containers	14,750.00
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 46 Projected Activities (2030)

Period	Activity
January-March 2030	a) Census application in extension areas of the ISWM project.
April -June 2030	a) Start of training program for families in extension areas: Las Garitas: In the month of April the talks in Las Garitas on awareness of the management of domestic solid waste and its treatment will begin. In that month two talks will be held. b) During the period May-June 2030, there will be two talks and orientation workshop on solid waste management.
June-August, 2030	a) Continuation of the chat training program for families in extension areas: Majagual and Arroyo Hondo. b) In the period June-July 2030, there will be three talks and orientation workshop on solid waste management.
September-December, 2030	a) Continuation of the training program for families in extension areas: Los Corrales: In September, talks will be held in Los Corrales and Batey La Hormiga on awareness of the management of domestic solid waste and its treatment. In that month two talks will be held. b) In the period October-November 2030, there will be three talks and orientation workshop on solid waste management. c) During the period of November will continue the program of awareness to the families on the management of solid waste.

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

Table 47 Cost of activities (2030)

Period	Activity	Cost / budget RD\$
January March	Census in extension areas-ISWM	0.00
April	02-Talks	6,314.28
may	02-Talks	6,314.28
June	02-Talks	6,314.28
July	03-Talks	9,471.42
September	02-Talks	6,314.28
October November	03-Talks	9,471.42
Year	Advertising- Paloma FM 103.9	34,000.00
Year	Advertising Passion FM 103.1	34,000.00

Source: ADS-FOCIMIRS-MARENA Planning Team, 2016.

LEGAL ASPECTS:

- a. To maintain the monitoring of the compliance with the municipal ordinances and resolutions regarding the collection of payments by the collection service, both to the commercial sector, as well as institutional and family to support the system.
- b. Constantly review existing regulations under the ISWM.
- c. Promote, when necessary, new ordinances or resolutions in the Chapter Hall.

ORGANIZATIONAL AND INSTITUTIONAL ASPECTS:

Maintain the institutional capacity strengthening for the implementation of the ISWM, and seek the functionality of the team responsible for the implementation of the ISWM and the areas or departments involved.

6 Roles and responsibilities in the ISWM Plan

The main role for the implementation of this plan rests with the Mayor's Office of Sánchez. Other relevant institutions that can contribute to the sustainability of the ISWM in the municipality are:

- Ministry of Environment and Natural Resources
- Ministry of Education (MINERD) (District 14-05 and education centers through addresses).
- Ministry of Public Health (MSP), regarding the management and collection of biomedical solid waste.
- Ministry of Tourism (MITUR);
- Private business sector of the municipality of Sánchez.
- The Dominican Municipal League
- Dominican Federation of Municipalities

ATTACHMENTS

Attachment 1:RESULT OF THE PILOT PROJECT

1. Citizen participation in the application of the 3R's for solid waste management in the municipality of Sánchez, R.D

1.1 Introduction

In compliance with the procedures established by the Japan International Cooperation Agency for Program (A) (J1504013) on Solid Waste Management, through which it is promoted in municipal institutions and state institutions, the efficient management of Solid waste; The Mayor of the Municipality of Sánchez, Rep. Dom., In its commitment to improve environmental conditions and implement the proper management of solid waste generated by the activities of domestic activities, formulates and establishes this plan of action on citizen participation in the application of the 3R's for solid waste management in the municipality of Sánchez, RD, which will have an implementation period of eight (08) months. It has reach in all the urban area and peripheral zones of the municipality.

This plan was elaborated and articulated in accordance with the guidelines established in the international course for the solid waste management that was carried out in the country of Japan and attending to the municipal needs, in the understanding that the municipality of Sánchez requires ceasing to be a repulsive tourist resource. The present document proposes for its execution, a series of actions aimed at developing an adequate management in the solid waste management, in a pilot area, that includes the Play district of our municipality, in order to prevent and mitigate the impacts generated that are triggered by the development of domestic activities of families.

1.2 Background

Regarding the background, it should be noted that in 2014, the Mayor of Sánchez was selected by the Ministry of Environment and Natural Resources (MARENA) to develop the Institutional Strengthening Project for Integral Management of Solid Waste (FOCIMIRS), With the support of the International Agency for Cooperation of Japan (JICA).

Regarding the components of the project, the Mayor of Sanchez decided to develop actions to promote the integral management of solid waste, taking as a point of execution the strategy of 3 R (Reduce, Reuse, Recycle).

By virtue of which, in September of the same year, we participated in a workshop on the integral management of solid waste, aimed at acquiring the previous competences to carry out the first executions of the project.

Also, from March 24th to the 31st of the present year, a first solid waste characterization study was carried out in the municipality of Sánchez, with a sample of fifty (50) families and a duration of eight (08) days , Whose results were as follows:

Generation per capita and density of household waste: The average generation per capita of municipal waste reaches 0.46 kg / hab / day. Meanwhile, the density of waste for the highest quintile reaches 127.13 kg / m³ and 147.92 kg / m³ and 135.12 kg / m³ for the middle and low quintiles of this municipality.

These results revealed that 67% of domestic waste generated in the municipality of Sánchez, are organic, because the area is characterized by an eminently agricultural economy and consequently the waste has high moisture.

1.3 Plan Description

This action plan on citizen participation in the application of the 3R's for the management of solid waste in the municipality of Sánchez, RD, is developed with the purpose of preventing and / or minimizing the health and environmental impacts that these cause in our municipality, through the guidance of the population and the municipality regarding the execution of generation, collection, storage, treatment, transportation and final disposal operations. In the same one it is proposed the adequate management of residues of organic and inorganic origin that have fulfilled

their purpose for the users and that for the same they do not have practical utility for the activity that produces it, since they come from the domestic activities, commercial, industrial and of all kinds that take place in the municipality.

Therefore, this action plan describes the following topics: Objective of the plan, goal, steps for implementation, implementation schedule, Human Resources, physical and financial resources, financing and responsible agencies and their roles.

1.4 Action Plan Objective

To implement specific actions for the Integral Solid Waste management, in the municipality of Sánchez, emphasizing the methodology of the 3R's, through the transfer of knowledge and experiences acquired to harmonize environmentally with sustainable development through good practices and responsibilities both family and municipalities with the waste generated.

1.4.1 Especifics

No.1: Implement a pilot plan with awareness actions in a total of four hundred (400) families in the Play District of the municipality of Sánchez, on the responsibility for the integral management of solid waste, for the welfare of said community.

No.2: Promote a total of one hundred (100) families that will be later extended to four hundred (400) families in the Barrio Play, El Cangrejo and Los Rieles communities of the municipality of Sánchez, the appropriate management of solid waste and recycling practices, based on the 3R.

1.4.2 Goal

To ensure that in the period from September 2015 to April 2016, the families of the Play District, El Cangrejo and Los Rieles districts of the municipality of Sánchez will know and implement the adequate segregation of solid waste in the generation source and in the longer term promote actions to take advantage of their benefits aimed at improving the quality of life of said community.

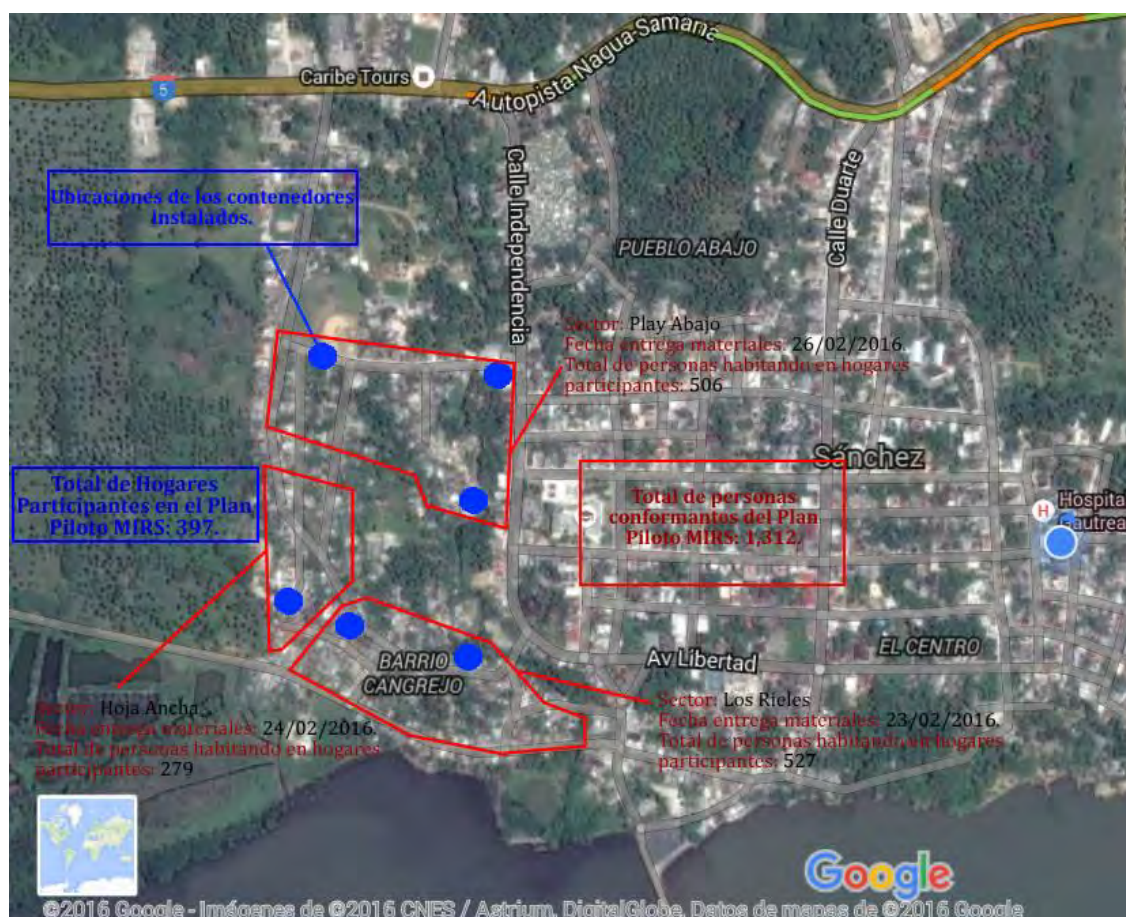


Figure 6 Location of separate waste containers

1.5 Implementation Steps

During the period of eight (08) months, different talks will be given through the community meetings and the school in the Barrio Play sector of the municipality of Sánchez (see schedule), with the aim of integrating and raising families' awareness of the project of solid waste management through the methodology of the 3R's to guarantee an appropriate management of the solid residues that are generated in the homes.

Likewise, the installation of containers for three (03) types of waste will be sought in coordination with the Mayor of Sanchez and the Ministry of the Environment in such a way as to maintain the environment of separation at source and families feel fully committed to the integral management of the waste they generate in their homes.

These actions include the training of a force of ten (10) people in the processes of waste collection by zone, so that the collection becomes an economic activity for

groups focused in the municipality of Sánchez. The results of this pilot project will be transferred to the entire municipality of Sánchez and in due time to the other municipalities of the Dominican Republic; According to the goal established by JICA and MARENA of 15 years (2031).

In order to strengthen the Municipal Government's response to the citizens' decision, it will proceed to deal with some embassies, mainly in Japan with the intermediary of JICA, obtaining collection equipment that provide greater benefits and thus achieve an efficient and effective implementation of the collection program.

The waste collection program will be redesigned by zone throughout the municipality, using the method of time and movement study, based on the experience acquired in the city of Sapporo - Japan, in 2015.

Likewise, the program of waste collection routes will be redesigned by zone in the whole municipality, in order to make collecting more effective; Applying this methodology based on the experience gained in the city of Tokyo - Japan, during the year 2015.

Complementary strategies:

In the area of the current landfill it is proposed the construction of a collection area for separated and classified waste, which can be exploited; And also to recondition that landfill that may operate in said zone as a municipal landfill under operable conditions and that the emission or collection of greenhouse gases and leachate can be managed.

This plan also consists of operating the route of the pilot area, which includes the communities Play, Los Rieles and El Crab, which currently has about 400 families, and implement the collection of separated waste door to door, taking as a principle the type of collection by type of waste, in such a way that real results can be achieved, oriented to guarantee the service offered by the Mayor's Office.

Citizen integration:

For the purpose of integration, the map will be revised and designed the neighbor councils of the municipality to establish the responsibilities of each one and also, to

hold meetings with the committees and other organizations to inform them of the municipal action plan.

Promote and carry out the design of a web page that informs the population the progress of the municipal action plan in a graphic and literal way.

In order to strengthen the implementation of this action plan on citizen participation in solid waste management in the municipality of Sánchez, the proposal will be submitted through the Chapter Hall of the Municipal City Hall to issue an ordinance that compromises the interest of the citizens to their integration and participation in the Plan for the Management of Solid Municipal Waste, based on the 3R's.

The aim is to improve the following axes: Mitigate infection outbreaks, proliferation of insect vectors and rodents, which can transmit diseases and epidemics, contamination of water sources.

The major environmental effect of solid waste is the contamination of surface and groundwater by leachates produced from the decomposition of waste that is carried by the natural drainage to the canyons that cross the urban area of the municipality of Sánchez. We know that the decomposition of solid waste generates bad odors, in addition if they are burned both in the gardens of the homes and in the municipal open dump and the fumes produce pollution.

1.6 Implementation Schedule

Table 48 Implementation schedule of the pilot project

MONTH/WEEK	ACTIVITY	PLACE	DATE
November 2015	Meeting with directives of the Community Council to explain the start of the plan	Meeting Venue Community Council	Broad Leaf Zone / play district
December 2015	Chat with the neighborhood meetings and mothers' clubs and discussion of the action plan, including technicians from JICA and MARENA	City Hall	Accomplished
December 2015	Start organizing works of recyclers and classifiers in the municipality.	City Hall	Accomplished
January, 2016	Talk with the neighborhood meetings and mother's clubs about orientation of the 3R's	City Hall	Accomplished
January, 2016	Meeting for the installation of clean points and assigned responsibilities	School Teacher Matthew	Accomplished

MONTH/WEEK	ACTIVITY	PLACE	DATE
February 2016	Support of the program and guarantee of collection of waste by type	Barrio Play, Los Rieles and El Cangrejo	Accomplished
March, 2016	Follow-up to the execution of the plan, including technicians from JICA and SEMARENA	City Hall	Accomplished
April, 2016	Meeting for the evaluation of the action plan with meetings of neighbors, mayor and technicians of JICA and MARENA	City Hall	Accomplished

1.7 Required Human Resources

For the implementation of the action plan, trained technical personnel in Japan, JICA advisory staff and Ministry of Environment personnel will be required.

1.8 Required Physical Resources

Technological: Data Show, Laptop.

Didactic resources: Flip chat, notebooks, pens, pencils, notebooks, among others.

Local logistics: meeting center and meetings

Transportation: 01-Bus for the transfer to the meeting centers and visits to the final disposal point.

1.9 Financial Resources Needed

The financial resources must be provided by the following institutions:

Ministry of Environment: travel expenses for the guests.

JICA Santo Domingo: expendable material and didactic and technological resources.

1.10 Financing

The financing of the plan should be provided by JICA, the Ministry of the Environment and Natural Resources (Solid Waste Management). Ministry of Public Health and Social Assistance, Ministry of Tourism and Ministry of Education. This

integration seeks to ensure that each institution integrates into its budget plans the municipal action plan based on the experience of the pilot plan.

1.11 Responsible Agencies and their Roles

The responsible agencies that have been taken into account for the implementation of this action plan will be:

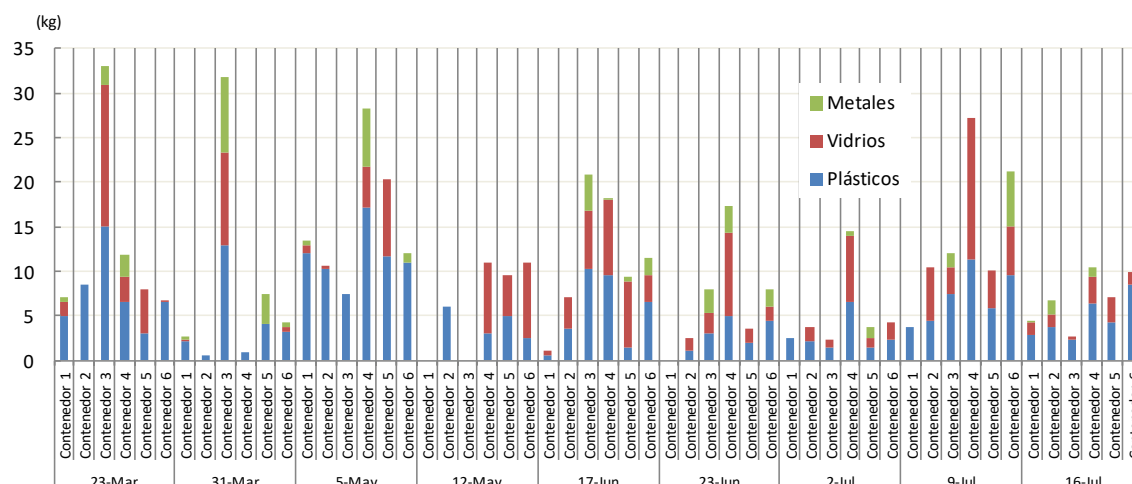
1. Sánchez City Council (ADS): Executor of the action plan: The proposal will be submitted that an ordinance be approved in the Capitular Hall of the municipality that compromises citizens' interest in their integration and participation in the Comprehensive Management Plan Of solid waste based on the 3R's.
2. Ministry of environment and natural resources (MARENA): Regulator of the action plan.
3. Japan International Cooperation Agency (JICA): International technical assistance and advice
4. Ministry of Tourism: Economic contributions
5. Ministry of Education: Economic contributions

This aspect raises that the integration is of all; And consequently, it is necessary that this plan be known to various institutions for the purpose of being direct participants in the implementation of it.

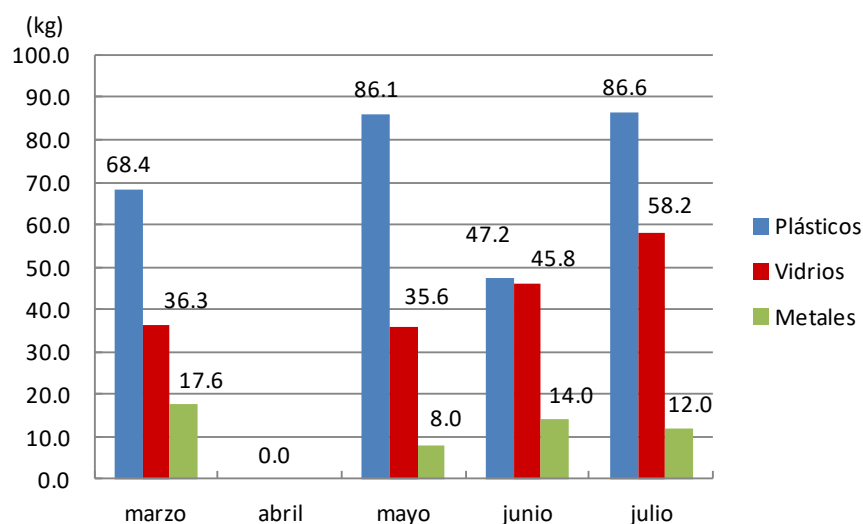
2 Results of waste weighing

Fig. 10 shows the results of collected recyclables from March to July during the pilot project. In April it was impossible to collect recyclables because the collection vehicle was damaged. The municipality mainly announced "Plastic" and "Metal" for communities, but many vessels are included in the recycled materials collected. There is a slight increase in plastic and glass between March and July. On the other

hand, the metal is not increasing (Figura 11). A total of 515.8 kg of recyclable materials were collected (Table 48).



Graph 4 Residue weighing results



Graph 5 Residue weighing results

Table 49 Residue weighing results

(Unidad : kg)

Contenedor	Plásticos	Vidrios	Metales	Total
Contenedor 1	28.7	4.7	1.1	34.5
Contenedor 2	40.0	14.7	1.6	56.3
Contenedor 3	60.1	39.3	18.5	117.9
Contenedor 4	66.3	59.7	13.5	139.5
Contenedor 5	38.7	35.0	5.1	78.8
Contenedor 6	54.5	22.5	11.8	88.8
Total	288.3	175.9	51.6	515.8

3. ISWM Sánchez Project: Variable Counting and Interpretation of Results

ISWM Sánchez Survey, prov. Samaná, August 2016.

3.1 Variables interpretation

Based on the surveys / interviews applied to 399 citizens in the municipality of Sánchez, prov. Samaná, in the dates from July 25 to 29, 2016, yielded 2,793 variables based on the 7 questions of value made, which are interpreted as follows:

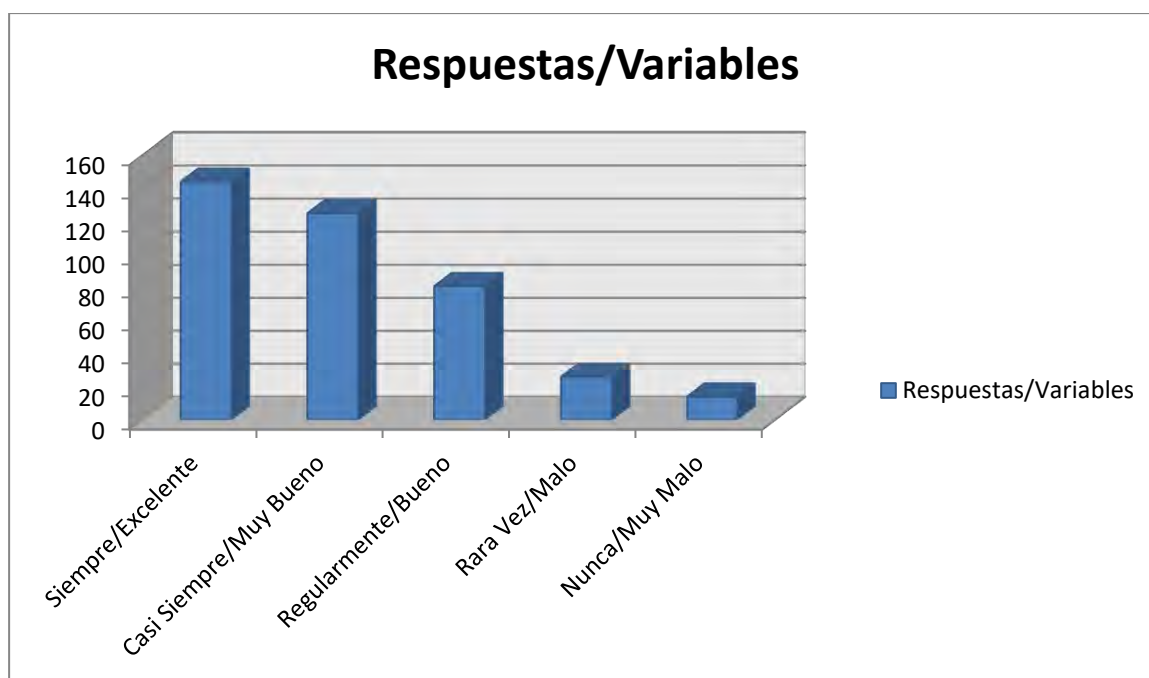
Values of reference	
1	Always / Excellent
2	Almost Always / Very Good
3	Regularly / Good
4	Rare / Bad
5	Never / Very Bad

3.2 Project integration /Total Variables:

3.2.1 How often do you deposit recyclables in the buckets?

For the most part, people always deposit recyclable materials in their cubes.

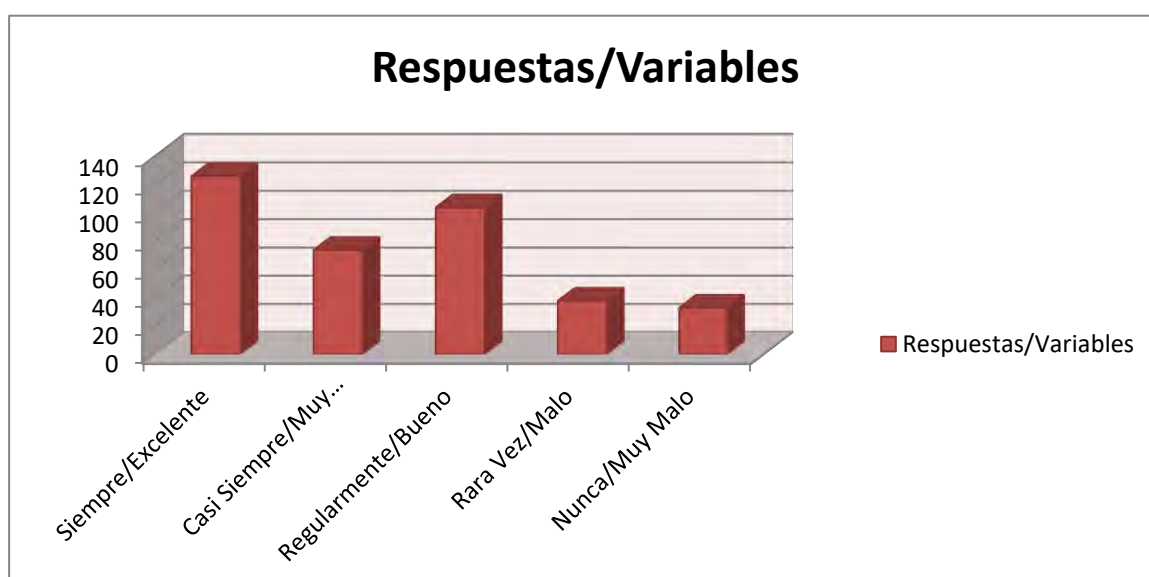
Values of reference	Answer
Always / Excellent	144
Almost Always / Very Good	125
Regularly / Good	81
Rare / Bad	26
Never / Very Bad	14



3.2.2 How often do you take them to special containers?

Most people always deposit such recyclable materials from their buckets in the special containers, once the first ones are full.

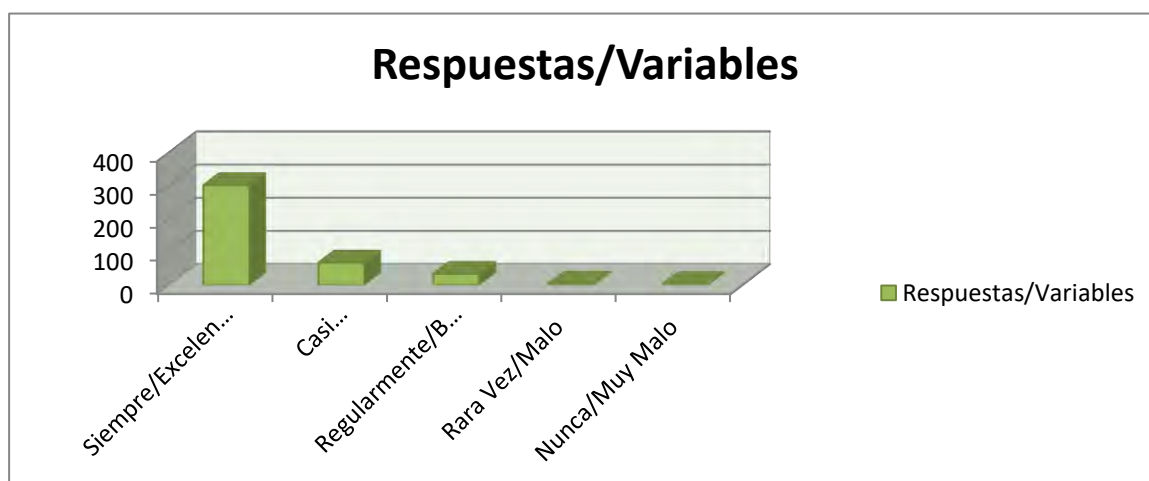
Values of reference	Answer
Always / Excellent	126
Almost Always / Very Good	74
Regularly / Good	104
Rare / Bad	38
Never / Very Bad	33



3.2.3 Would you like that as a Community Council that you and the others could sell your recyclables directly or to the Mayor?

Mostly obvious, people are in agreement and wish that as a Community Council they can market their recyclables.

Values of reference	Respuesta
Always / Excellent	301
Almost Always / Very Good	67
Regularly / Good	33
Rare / Bad	3
Never / Very Bad	2

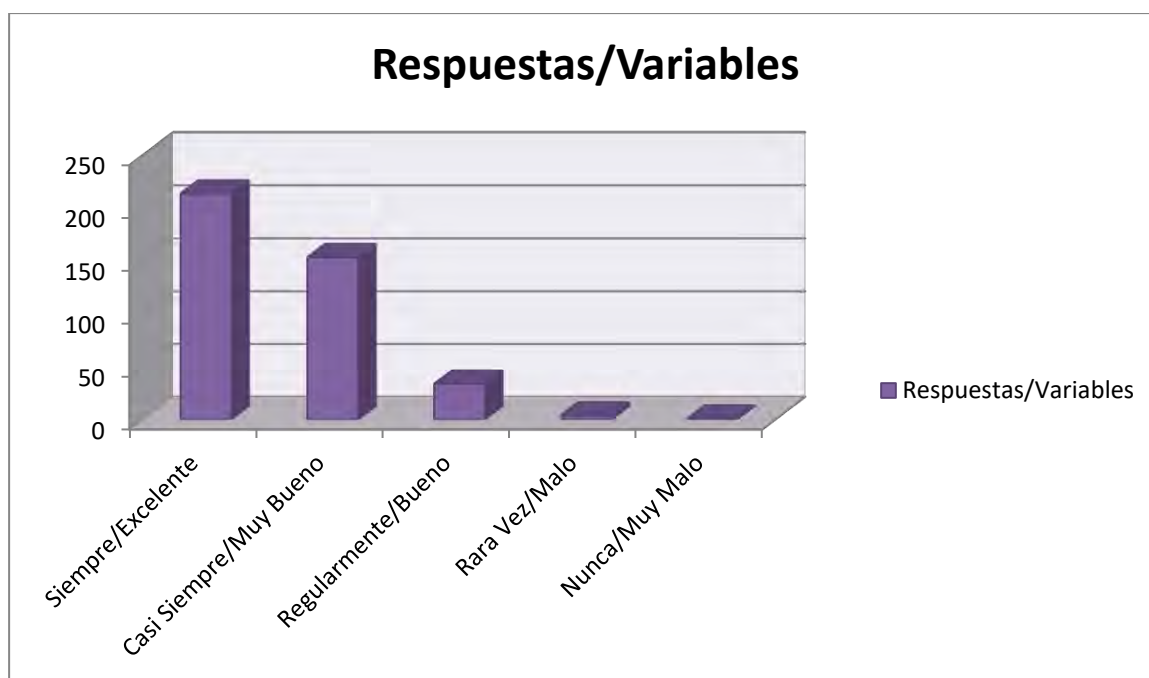


3.3 Satisfaction regarding the Pilot Project.

3.3.1 What is your assessment of the pilot recycling project?

Most people consider the ISWM Sánchez Project to be Excellent.

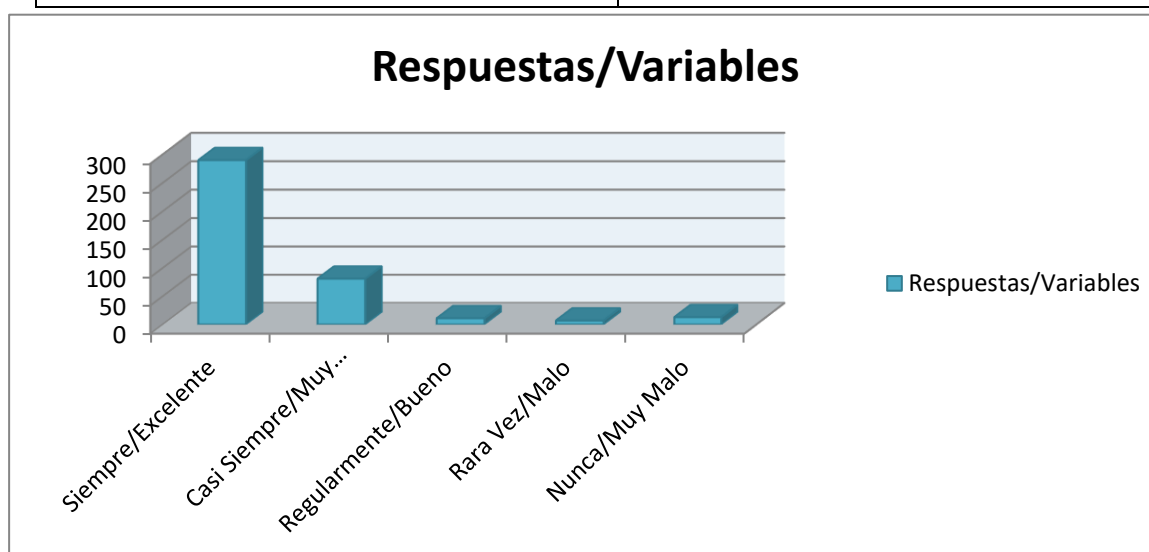
Values of reference	Answer
Always / Excellent	214
Almost Always / Very Good	154
Regularly / Good	34
Rare / Bad	4
Never / Very Bad	1



3.3.2 Do you think your sector should continue with the project?

For the most part, people consider and want this project to continue in their sectors.

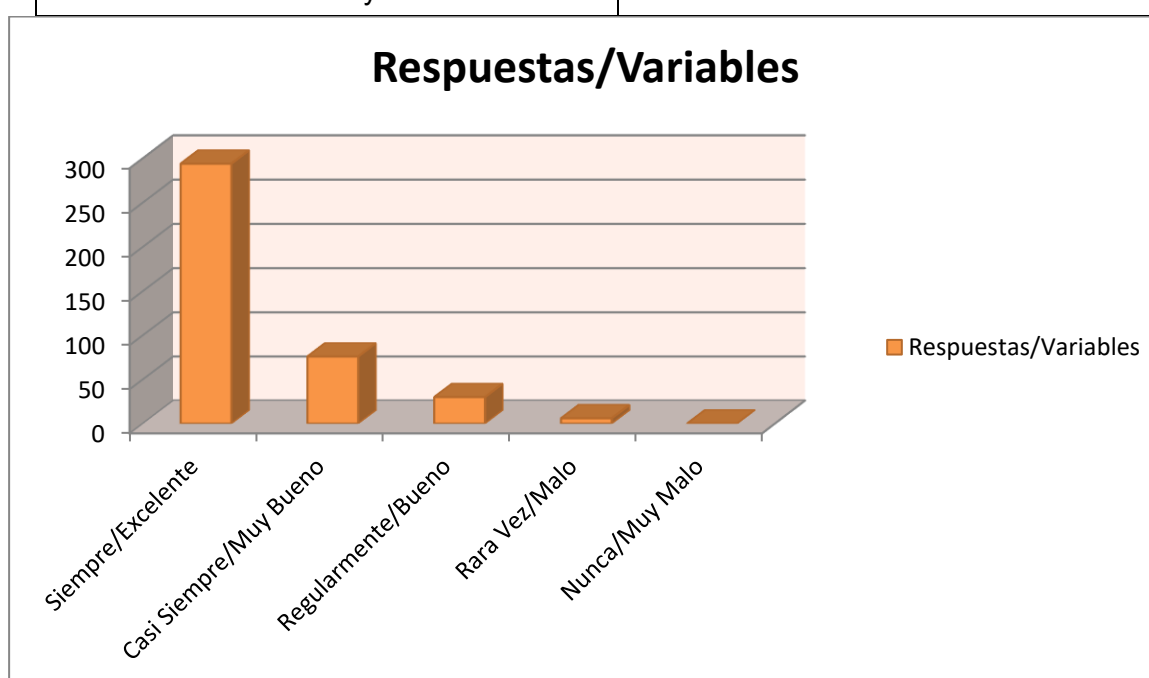
Values of reference	Answer
Always / Excellent	290
Almost Always / Very Good	81
Regularly / Good	11
Rare / Bad	7
Never / Very Bad	13



3.3.3 Will you continue to be part of the project?

Mostly obvious, people are willing and happy to continue participating and being part of the project.

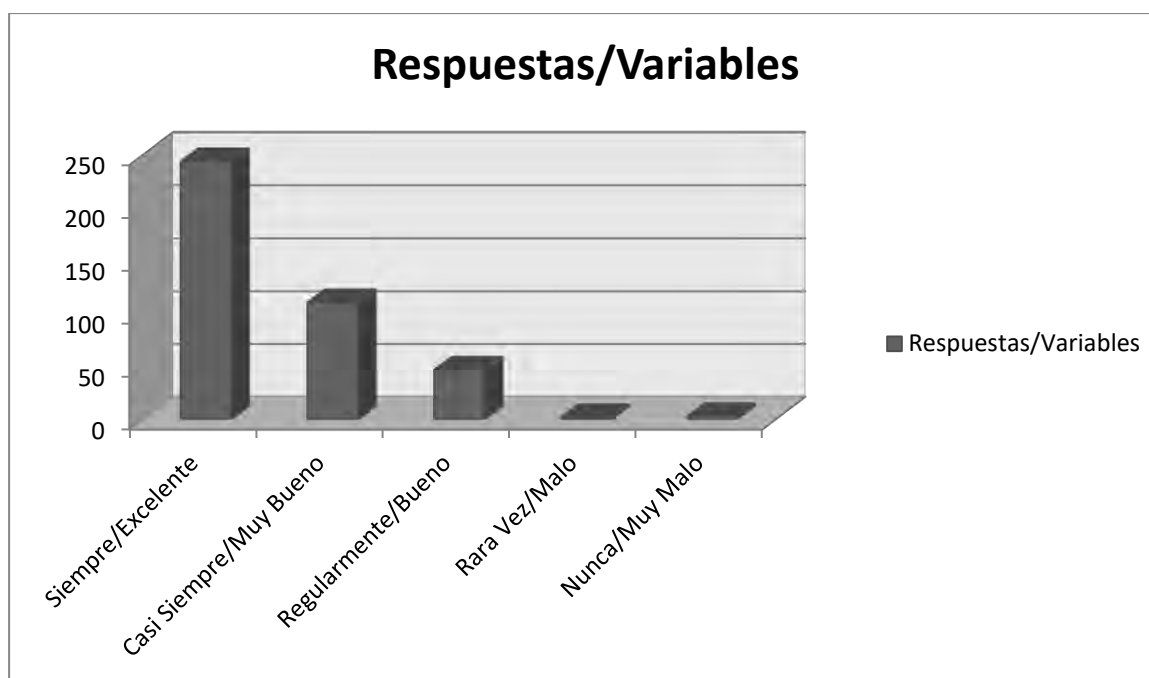
Values of reference	Answer
Always / Excellent	294
Almost Always / Very Good	76
Regularly / Good	30
Rare / Bad	6
Never / Very Bad	0



3.3.4 What improvements do you recommend for the project?

For the most part, people consider it an excellent idea that we can continue to improve all aspects of the ISWM Sánchez Project.

Values of reference	Answer
Always / Excellent	244
Almost Always / Very Good	111
Regularly / Good	47
Rare / Bad	2
Never / Very Bad	3



CONCLUSIONES

From the residents in the previously mentioned test sectors, we can say, based on the observation during these months, the general opinion, the weekly weighing data, the inspection of household and special containers and the recently applied survey instrument, which in more than 95%, people have become more than satisfactory and complying with the established standards of the ISWM Project, and this means that more than 380 households out of the 400 that are inserted in this test, already are faithful practitioners of the 3R's of recycling, all thanks to the surprising reception we have had in the execution of the project. Our people are aware that we need a change in favor of the environmental situation, and have shown that they are interested in doing so, and are doing so.

Therefore, the municipality of Sánchez, decided to expand the activity of segregation to the entire municipal area.