



San Carlos City

Negros Occidental

Solid Waste Management Plan (UPDATED) 2015





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Executive Summary

1. INTRODUCTION

The problem of solid waste generation and its management has become a genuine concern of the city. The rapid swelling population, increasing urbanization and intensifying economic activities have all contributed to the generation of solid waste.

In response to this pressing concern, the Local Government Unit of San Carlos City has adopted measures to anticipate vis-à-vis expansion of solid waste management services, provision of a more cost-effective waste collection and transport, development and establishment of cost effective solid waste disposal facility.

The enhancement of the city's solid waste management will be done in accordance with the provisions of Republic Act 9003 otherwise known as the Ecological Solid Waste Management Act of 2000.

While every citizen is responsible for its waste segregation at source, the city is primarily in-charge of collection and transport of residuals until final disposal. Thus, the City Government formulated and updates the Ten (10) Year Solid Waste Management Plan. The Plan will serve as guide to public and private stakeholders in the implementation geared towards compliance of R.A. 9003. However, the plan will only be effective if all stakeholders will response and cooperate to the call of environmental protection not just merely compliance.

The City Government acknowledges the support of various local and international partners to name a few; the Provincial Environment Management Office (PEMO), the German Development Service or DED and the German International Cooperation (GIZ) through its expert/volunteer who rendered technical expertise in the formulation and updating of the Solid Waste Management Plan.

The Updated Ten (10) Year Solid Waste Management Plan for the City of San Carlos is being anchored on its vision, mission, goals and objectives.

Vision

A San Carlos City wherein all stakeholders are actively participating to achieve an ecologically sustainable and economically viable zero-waste management, through an enforceable ESWM ordinance.



Mission

Achieve zero waste management by empowerment of all stakeholders and through the enactment of an ESWM ordinance. Implement ecologically and economically sustainable, replicable waste management initiatives agreeable with local and national laws.

Goals

- To update the SWM plan of San Carlos City.
- To enhance the affectivity of the Solid Waste Management Board in the implementation and monitoring of the SWM plan.
- To pursue the continued education the San Carlos stakeholders on the values and practices of Ecological Solid Waste Management.
- To source out and network with various government and private sector agencies on the best ecologically and economically sustainable practices of ESWM for San Carlos City.
- To source out resources and funds that will support the development and implementation of ESWM in San Carlos City.

Objectives

- To continue the formal and non-formal education of all stakeholders in the proper practice of ESWM.
- To have well trained and efficient garbage collection manpower to enhance the collection of garbage.
- To pursue initiatives for the generation of safe livelihood from by-products of waste management.
- To eliminate the use of ecologically unsound materials and practices.
- Sourcing affordable and ecologically sound technologies adapted to the unique environs of San Carlos City.
- Establish the hardware and manpower components for ESWM.
- Adopt incentives for the practice of ESWM



1.1 Purpose

The City's vision relative to effective & efficient solid waste management will be realized through active involvement and participation of all stakeholders anchored on ecologically sustainable and economically viable zero-waste management program interventions.

The primary goal of the plan is to comply on the three (3) major compliance of the Republic Act 9003 namely; segregation at source, segregated collection and establishment and operation of a final disposal facility.

1.2 Approach

As to one of the provisions of RA 9003 in connection with the regular updating of the 10 Year SWM Plan, the Local Government Unit of San Carlos City is consistent with the law in complying with the updating of the plan which is in accordance with the annotated outline prescribed by the National Solid Waste Management Commission (NSWMC).. The updated City's Ten (10) Year Solid Waste Management Plan is currently prepared by the City Environment Management Office (CEMO), a new office which has been created by virtue of City Ordinance No. 13-01 effective January 01, 2014 mandated to implement all environmental programs and projects of the city. The new department integrates the former Solid Waste Management Office (SWMO) as one of its Office Division comprising the CEMO.

The following steps and approaches had been undertaken relative to the updating of the City's Ten (10) Year Solid Waste Management Plan;

1. The data and vital information generated during the regular City SWM Board meetings has been utilized as one of the vital considerations in the updating of the plan. Based on current records and reports (e.g. collection route & schedule, Central MRF and Landfill operation, composting activities) and other waste diversion strategy were inputted. The previous plan was evaluated and scrutinized in order to make necessary adjustments to address pressing issues and concerns. Other considerations were likewise acknowledged so that contingency measures will be prepared planned out for the future.
2. The City Environment Management Office had tapped the assistance of the Provincial Environment Management Office (PEMO) for the conduct of Waste Analysis and Characterization Study (WACS). The specific training module and hands on training for WACS was also conducted at the San Carlos City Eco-Center wherein CEMO staff were oriented with the proper procedures in completing the integral Waste Analysis and Characterization Study by conducting actual physical examination method of quartering on a certain percentage of actual collected waste sample.



The community participatory approach has been employed wherein the stakeholders were get involved by extracting their individual ideas and inputs to fit in and harmonize the elements of the updated plan. As part of the process, the specific outputs has been deliberated and laid out through the conduct of pulong-pulong or public consulta together with barangay officials to inform them about specific roles as stakeholders and their crucial role relative to the plan updating.

1.3 Acknowledgment

The updating of the San Carlos City Ten (10) Year Plan would not have been possible without the guidance of various agencies and individuals who in one way or another contributed and extended their valuable assistance in the preparation for the revision and amendment of the plan.

First and foremost, with the gratitude to the San Carlos City Technical Working Group (TWG) under the auspices of the City Solid Waste Management Board, the Provincial Environment Management Office (PEMO), the National Solid Waste Management Commission (NSWMC) whose technical inputs, moral support and encouragement has been an inspiration in the completion of the updated 10-year Solid Waste Management Plan.

2. CITY PROFILE

2.1 Location

The City of San Carlos is located at the Northeast part of Negros Island, 123°23'65" longitude and 10°25'15" latitude, bounded on the North by the Municipality of Calatrava, on the West by the Municipality of Don Salvador Benedicto and the City of Bago, on the South by Municipality of Vallehermoso (Negros Oriental) and the City of Canla-on, and the East by Tañon Strait

It is likewise situated in the heart of the Visayan Islands in the central Philippines close to the main sea-lanes of South East Asia. The City Government aims to develop San Carlos into a modern 45,150 hectare agro-industrial zone with a 5,000 hectare new town built along 18 kilometers coastline. The city has great potential for various types of development given its abundant natural resources and available land for development; its strategic location at the core of several economic growth centers in the Visayas; its improving transportation linkage; and high levels of government support and private sector participation.



2.1.1 General Zoning Map

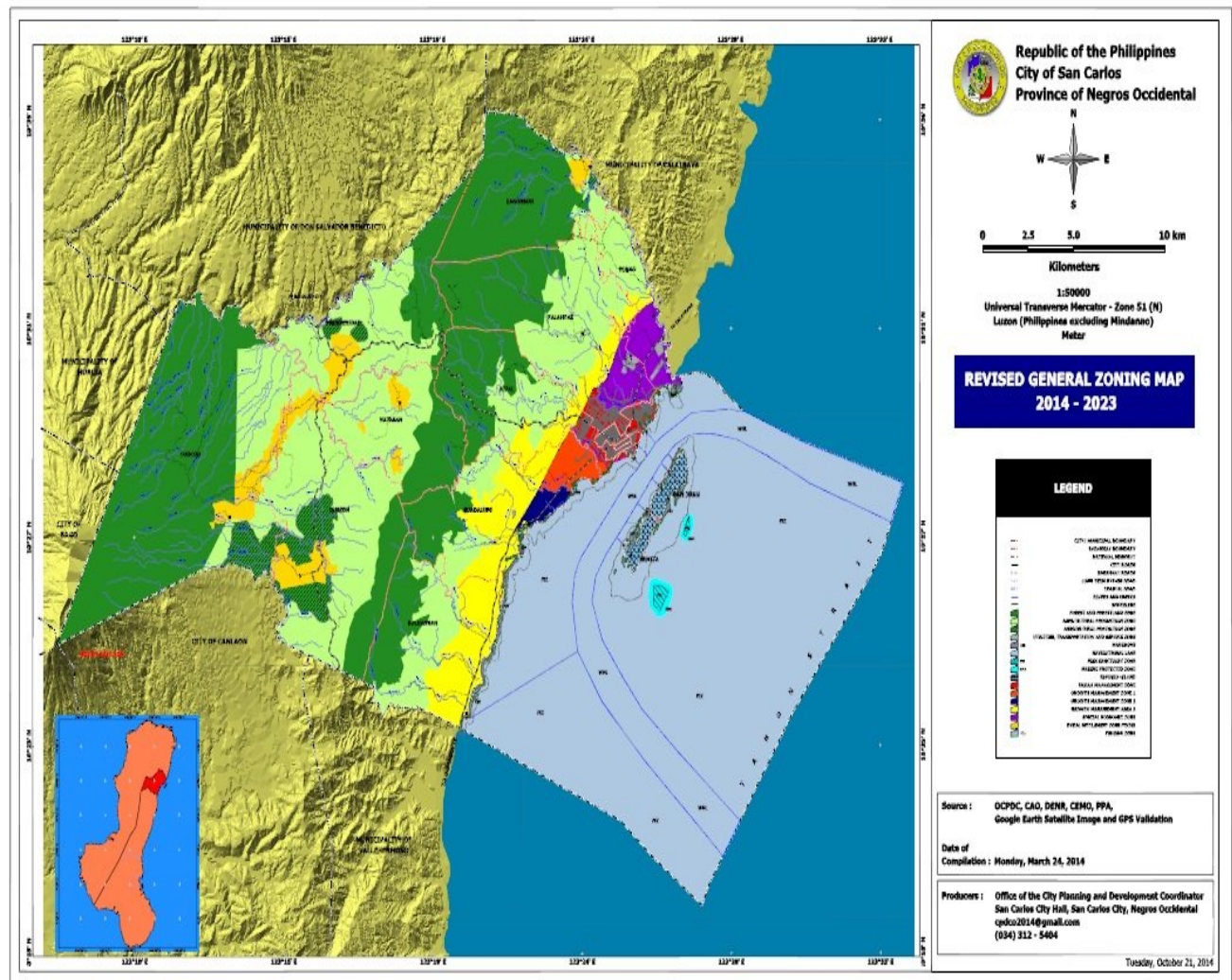


Figure 2.1.1: General Zoning Map



2.1.2 Urban Management Zone Map

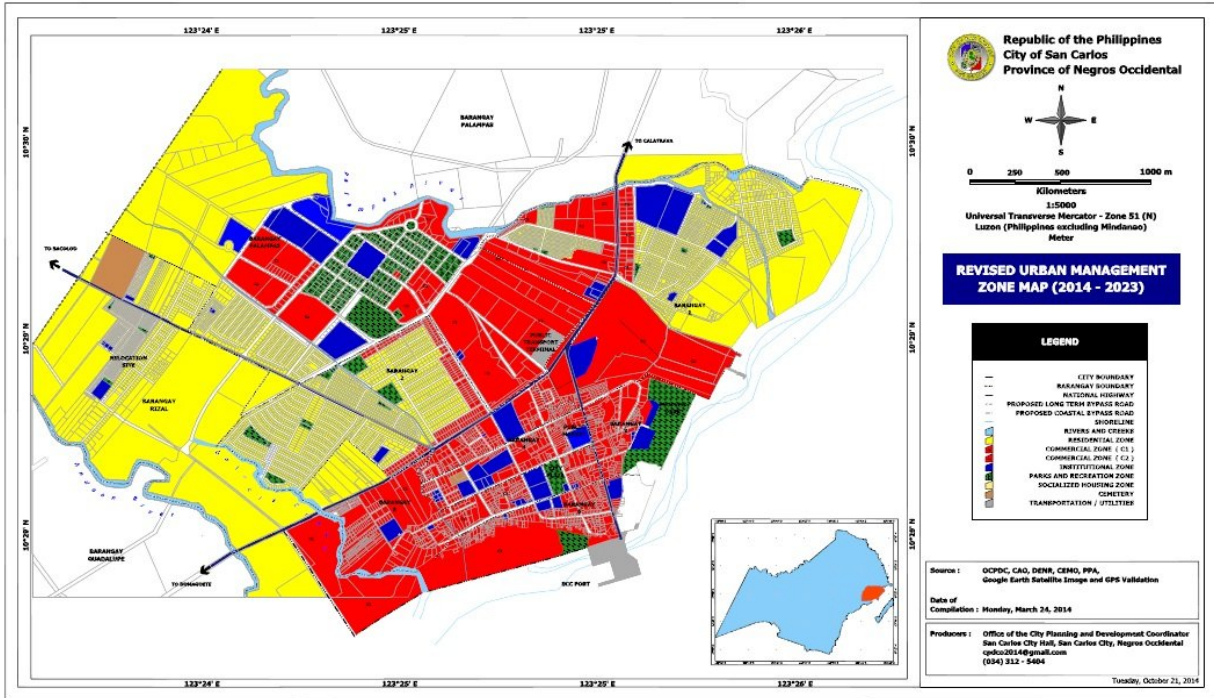


Figure 2.1.2: Urban Management Zone Map

2.1.3 Land Area

San Carlos City has a total land area of 45,150 hectares. It has eighteen (18) barangays, of which fifteen (15) may be classified as urban and three (3) as rural.

2.1.3.1 Land Area by Barangay

Barangay	Area (in hectares)	% of Total Area
URBAN AREAS		
Barangay I	162.32	0.36%
Barangay II	73.33	0.16%
Barangay III	9.60	0.02%
Barangay IV	19.51	0.04%
Barangay V	50.74	0.11%
Barangay VI	13.60	0.03%



Bagonbon	2,561.92	5.67%
Buluangan	4,682.16	10.37%
Codcod	8,622.84	19.10%
Guadalupe	4,654.61	10.31%
Palampas	5,254.51	11.64%
Prosperidad	3,357.87	7.44%
Punao	1,729.18	3.83%
Quezon	8,199.42	18.16%
Rizal	2,944.28	6.95%
Subtotal	42,335.88	93.77%
RURAL AREAS		
Ermita	176.21	0.39%
Nataban	2,392.45	5.30%
San Juan	245.46	0.54%
Subtotal	2,814.12	6.23%
Total Area	45,150.00	100%

Table 2.1.3.1: Land Area by Barangay

2.1.4 History

The City of San Carlos was formerly named Nabingkalan, in honor of a beautiful daughter of a chieftain Negrito settlement in the area. The settlement was later bought by Carlos Apurado from Badian, Cebu who, with the help of fellow pioneers, developed the settlement into a thriving Christian Village.

In 1856, Senor Don Emilio Saravia, the first political military governor of Negros Island during the Spanish era, renamed the place and established it as a “pueblo”.

San Carlos prospered through the years, however, the village lost its “pueblo” category, and in 1890, when Negros Island was divided into Occidental Negros, San Carlos was recorded as an “arrabal” or barrio of Calatrava (Hilub-an).

San Carlos acquired its status as a town in late 1898 when Gen. Juan Araneta of the Revolutionary Philippine Republic officially proclaimed it as a municipality. This was confirmed by the American Military Administration in 1901.

In May 1942, the Japanese army occupied the town and encountered a defiant Municipal Mayor, Eugenio Antonio Sr., who refused to surrender and collaborate with them. He rallied the renegade soldiers along with loyal civilians and organized them as a guerilla unit. Thus, San



Carlos became the hotbed of resistance activities against the Japanese imperial forces by the first Combat team, 7th MD (Negros) Guerilla forces, under Major Uldarico Baclagan.

San Carlos became a city on July 01, 1960 with the passage of Republic Act No. 2643.

Another historical milestone in the life of the city is the cabinet meeting of Pres. Fidel V. Ramos in the city last August 27, 1996 making San Carlos the first component city to be made the venue of a Presidential cabinet meeting.

2.2 Population

Barangay	Actual Population	Projected Population									
	2010	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
I	10,376	10,878	10,982	11,086	11,191	11,298	11,405	11,512	11,619	11,727	11,835
II	6,833	7,164	7,232	7,301	7,370	7,440	7,511	7,582	7,653	7,725	7,797
III	3,501	3,670	3,705	3,741	3,776	3,812	3,848	3,884	3,920	3,957	3,994
IV	1,136	1,191	1,202	1,214	1,225	1,237	1,249	1,261	1,273	1,286	1,299
V	5,233	5,486	5,538	5,591	5,644	5,698	5,752	5,806	5,860	5,915	5,970
VI	6,268	6,571	6,634	6,697	6,761	6,825	6,890	6,955	7,020	7,086	7,152
Bagonbon	5,474	5,739	5,794	5,849	5,904	5,960	6,017	6,074	6,131	6,189	6,247
Buluangan	14,752	15,466	15,613	15,761	15,911	16,062	16,215	16,368	16,521	16,675	16,829
Codcod	12,846	13,468	13,596	13,725	13,855	13,987	14,120	14,253	14,386	14,520	14,654
Ermita	2,150	2,254	2,275	2,297	2,319	2,341	2,363	2,385	2,407	2,430	2,453
Guadalupe	10,765	11,286	11,393	11,502	11,611	11,721	11,833	11,945	12,057	12,170	12,283
Nataban	4,465	4,681	4,726	4,771	4,816	4,862	4,908	4,954	5,000	5,047	5,094
Palampas	9,246	9,694	9,786	9,879	9,973	10,067	10,163	10,259	10,355	10,452	10,549
Prosperidad	5,163	5,413	5,464	5,516	5,569	5,622	5,675	5,728	5,781	5,835	5,889
Punao	5,943	6,231	6,290	6,350	6,410	6,471	6,532	6,593	6,654	6,716	6,778
Quezon	11,530	12,088	12,203	12,319	12,436	12,554	12,673	12,792	12,911	13,031	13,151
Rizal	11,398	11,950	12,063	12,178	12,294	12,410	12,528	12,646	12,764	12,883	13,002
San Juan	2,902	3,042	3,071	3,101	3,130	3,160	3,190	3,220	3,250	3,281	3,312
TOTAL	129,981	136,274	137,568	138,875	140,194	141,526	142,871	144,234	145,604	146,987	148,384

Table 2.2: Actual and 10 Year Projected Population of San Carlos City



2.3 Economic Profile/ Land Use

2.3.1 Establishments

BANKS

- Metrobank
- Bank of the Philippines Island
- Rizal Commercial Banking Corporation
- Philippine National Bank
- Land Bank of the Philippines
- Development Bank of the Philippines
- Banco de Oro
- Producers Bank
- City Savings Bank
- China Bank

CREDIT CORPORATION

- Goodwill Credit
- ZFA Credit Corp.
- LGM Corporation
- Nabingkalan Lending Corporation
- TMGSI Lending Corporation
- NKB Lending Corporation
- NORKIS Lending Investors, INC.
- Commercial Lending Investors
- Yusay Lending Corporation
- C&L Lending Corp.
- Jaguar (Mosquera) Lending
- Rollies Lending
- Eagle Lending
- Forex Lending
- Free Will Lending
- Saratoga Lending
- Yang Lending
- K & T Lending
- BWL Lending
- Rolen Lending
- EVO
- Reynaldo Lending



- Chiu Lending
- J E K Lending

PAWNSHOP

- Alex
- Chamar
- Cebuana Lhuiller
- Maria Gracia
- Prime Asia
- Palawan
- M.Lhuiller
- RD Pawnshop
- GAP
- D’ Rec Press

CONFERENCE CENTERS/FUNCTION ROOMS

- Consuelo Community Center
- Carmel’s Inn & Restaurant
- SCC Multi-Purpose Hall/Session Hall
- YM Pension Inn
- Magdalena Cafe

EDUCATIONAL INSTITUTIONS

TYPE OF SCHOOL	PUBLIC	PRIVATE
1.Nursery/Kinder	5	10
2.Elementary	58	2
3.High School	5	5
4.College	1	3
5.Vocational/Technical	1	2
6.Non-Formal	1	0

RESTAURANTS & SNACK BARS

- Carmel’s Inn & Restaurant
- Ama Tiya’s Restaurant
- Tanquis Refreshment
- Jumbo Snack & Bar
- New City Filipino Snack House
- BAMBAM Breadhouse
- La Grota Italian Restaurant



- Angie's Snack House
- Magdalena Bakers, Inc
- Jollibee
- MOM's Restaurant
- Michaengels Restaurant
- Lagrotta
- 10-9 Resto Bar

RETAIL ESTABLISHMENTS

- Malls
 - ❖ Gaisano Capital San Carlos
- Mini Marts
 - ❖ Unitop
 - ❖ Novo
 - ❖ Lucky 99
 - ❖ JT Commercial
 - ❖ Ravenas
 - ❖ Robinas
 - ❖ Libra Mart
 - ❖ JM Tan Enterprises
 - ❖ MZ Store
 - ❖ Ester Shopping
 - ❖ Yolly Mart

LUMBER/HARDWARE/ELECTRICAL SUPPLIES/TIRES & MOTOR PARTS

- Elmo Parts Enterprises
- J. C. Liberty Development, Inc.
- Uy King Poe
- YCT Builders Center
- A & L Hardware
- San Carlos City Auto Supply
- Harumi Parts
- Powerlink
- C & B Electronic Supplies
- Tyre Tech
- Tire Rus Enterprises
- San Carlos Tire Supply
- YOKOHAMA
- P. Cristuta Motorparts and Tire Supply
- YOYONG Motorcycle and Bicycle Parts
- Joseph Tan Tires Supply



GASOLINE STATIONS

- Petron
- Petron - National Highway
- Shell – RCTT Gasoline Station
- Supergazz
- Sea Oil

PORTS (SEA & AIR)

	NAME OF PORT	MANAGED BY
1.	San Carlos City Port	Philippine Ports Authority (PPA)
2.	Buluangan Fish Port San Carlos City	Local Government
3.	Airport(On-going Construction)	Local Government

MAJOR TRANSPORTATION

- Land (connecting Negros Island) Ceres Liner, Vehicles-for-Hire
- Sea (connecting Toledo City, Cebu) LITE FERRY Shipping Co., A.S. Express, Fastcraft, Melrivic
- SCC Community Airport Govt.-owned



2.3.2 General Land Use Map

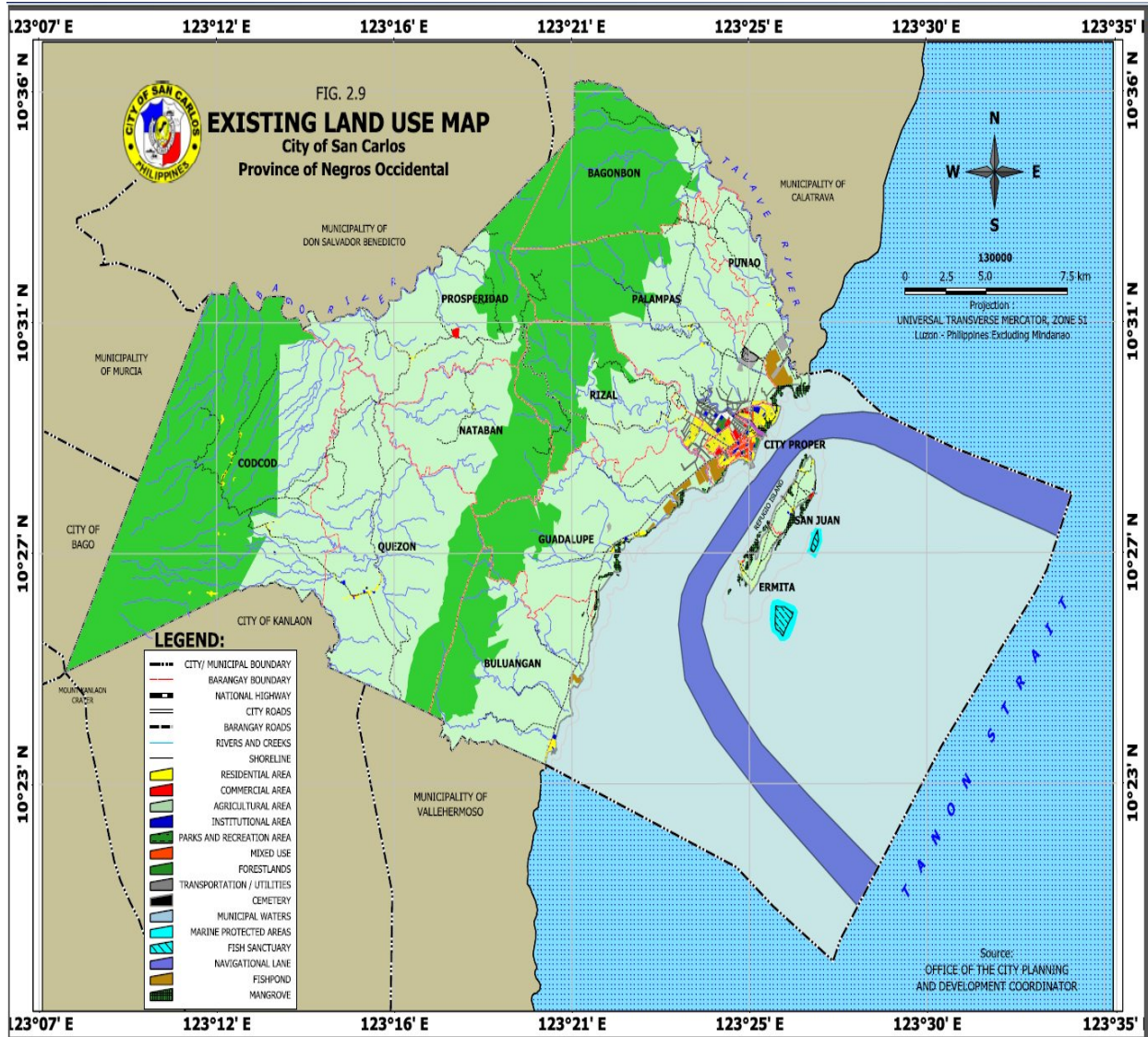


Figure 2.3.2: General Land Use Map



2.3.2.1 Areas of Existing Land Uses

Land Use	Area (has)	Share (%)
Commercial Area	44.25	0.10%
Residential Area	206.95	0.46%
Institutional Area	35.81	0.08%
Socialized Housing Area	9.32	0.02%
Parks and Recreation Area	37.81	0.08%
Idle Land (vacant)	246.82	0.55%
Cemetery	6.65	0.01%
Public Transport Terminal	1.75	0.00%
SCC Port	4.49	0.01%
Heavy Industrial	16.17	0.04%
Cell Site	0.28	0.00%
Built-Up Area - upland barangays	24.70	0.05%
Special Economic Zone (Bio-ethanol)	24.69	0.05%
Agricultural Area	23,688.17	52.47%
Forest Land	20,068.00	44.45%
Fishpond	210.79	0.47%
Mangrove (inland)	92.00	0.20%
Roads	431.35	0.96%
Sub-total (Land Area)	45,150.00	100.00%
Mangrove (water)	113.00	0.42%
Marine Protected Area/ Fish Sanctuary	193.15	0.71%
Navigational Lane	4,298.67	15.83%
Municipal Waters (open)	22,550.53	83.04%
Sub-total (Municipal Waters Area)	27,155.35	100.00%
Total Area – Land and Municipal Water Area	54,310.70	

Table 2.3.2.1: Areas of Existing Land Uses

2.3.3 Major Transportation Routes and Traffic Conditions

2.3.3.1 Roads and Transportation Facilities Map

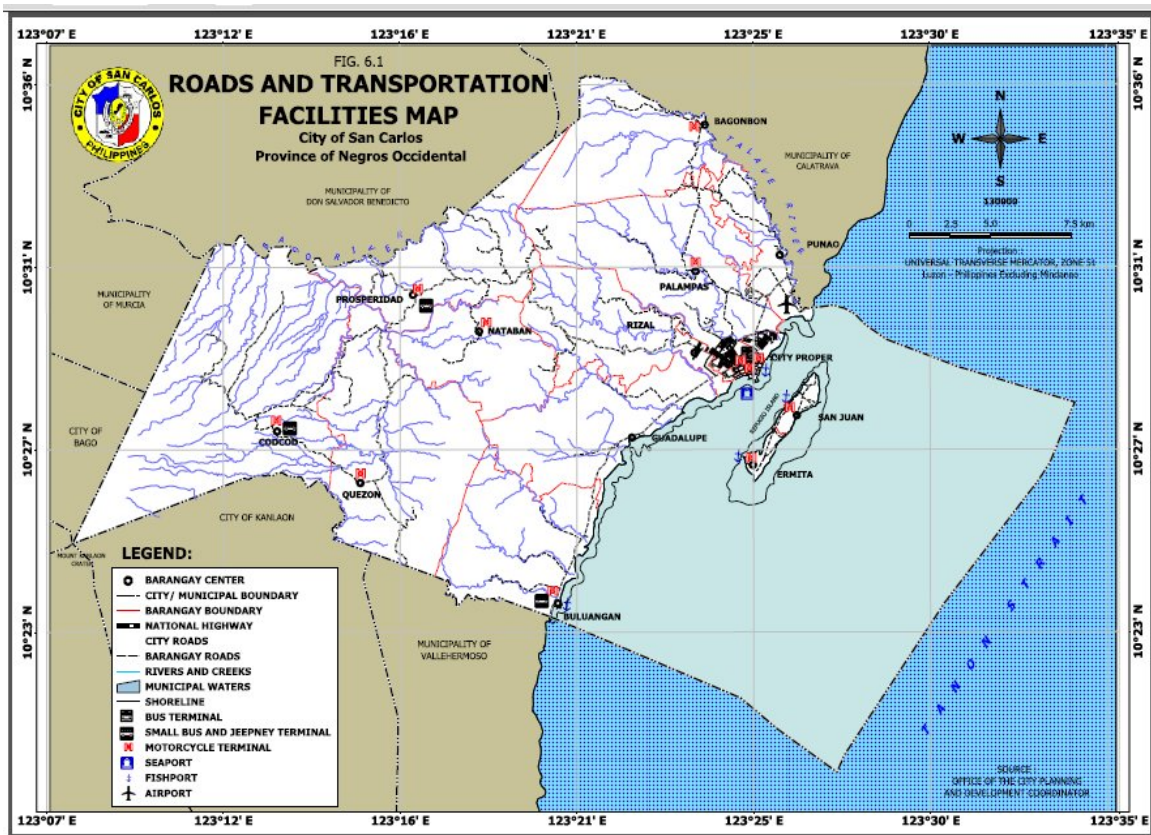


Figure 2.3.3.1: Roads and Transportation Facilities Map

2.3.3.2 Inventory of National Roads

Road Description	Length (Km)	Concrete (Km)	Asphalt (Km)	Gravel (Km)
San Carlos – Bacolod (North Road)	160.950	70.756	90.374	0
San Carlos – DS Benedicto – Murcia – Bacolod	71.798	69.746	2.052	0
Prosperidad – Quezon – Cabaron Road	16.638	4.565	0	12.073
San Carlos City Port Road	1.124	0.882	0.242	0
San Carlos – Dumaguete	No data	No data	No data	No data
Quezon to High Grains	No data	No data	No data	No data

Table 2.3.3.2: Inventory of National Roads



2.3.3.3 Inventory of Urban (City) Roads

Area		Length	Surface Type (in Km)		
			Concrete	Gravel	Asphalt
1	San Julio Subd.	6.326	6.326	0	0
2	Don Juan Subd.	1.724	1.724	0	0
3	Teachers Village	3.055	2.498	0.557	0
4	Margarita Village	2.206	1.845	0.361	0
5	City Proper	13.054	11.532	1.522	0
6	Urban Relocation Site	4.541	1.737	2.804	0
7	St. Vincent Subd.	4.233	1.859	2.394	0
8	St. Charles Village	0.510	0.51	0	0
9	Villarante Village	3.099	2.094	1.005	0
10	Algers	0.803	0.803	0	0
11	Circumferential Road	1.305	0	1.305	0
12	Business Park	6.196	5.856	0.34	0
Total		47.052	36.784	10.288	0

Table 2.3.3.3: Inventory of Urban (City) Roads

2.3.3.4 Inventory of Island Roads

Name of Barangay		Length	Surface Type (in Km)		
			Concrete	Gravel	Asphalt
1	San Juan	8.62	8.62	0	0
2	Ermita	5.21	5.21	0	0
TOTAL		13.83	13.83	0	0

Table 2.3.3.4: Inventory of Island Roads

2.3.3.5 Inventory of Rural (Secondary) Roads

Name of Barangay		Length (kms.)	Surface Type (in Km)		
			Concrete	Gravel	Sub Grade
1	Punao	16.1454	2.2935	9.2463	4.6057
2	Palampas	21.9910	4.3412	17.6498	0.0000
3	Nataban	17.4834	3.6000	4.1100	9.7734



4	Quezon	23.2082	5.1796	12.8286	5.2000
5	Codcod	55.1672	6.3609	29.6932	19.1131
6	Bagonbon	15.2401	4.5901	7.6500	3.0000
7	Prosperidad	19.2307	0.0000	6.9340	12.2967
8	Rizal	9.2500	0.0000	9.2500	
Total		177.7159	26.3653	97.3599	53.9889

Table 2.3.3.5: Inventory of Rural (Secondary) Roads

2.3.3.6 Estimated Average Daily Trips

Route	Year			
	2008	2009	2010	2011
North Bound (Jeepneys)	80	83	68	86
North Bound (Ceres)	24	26	26	25
South Bound (Jeepneys)	41	41	36	41
South Bound (Ceres)	33	35	32	43
Ceres via Don Salvador (DSB)	14	14	15	17
V-Hire	10	8	7	8
QCP Jeepneys	8	8	9	9

Table 2.3.3.6: Estimated Average Daily Trips

2.4 Physical Characteristics

2.4.1 Geographical Location

San Carlos City is located in the Province of Negros Occidental in the Western Visayas Region of the Philippines. The Western Visayas Region is characterized by wide stretches of rivers, coastal lowlands, and rugged hills and mountains, with predominantly rural areas providing for a variety of land uses. The region lies within two large inter-island water bodies; the Sibuyan and the Visayan Seas which include a number of bays and coves that provide good anchorages and potentially good port areas. San Carlos is located at 123°06'00" to 123°30'00" longitude and 10°36'00" to 10°22'00" latitude northeast of Negros.

2.4.2 Geology

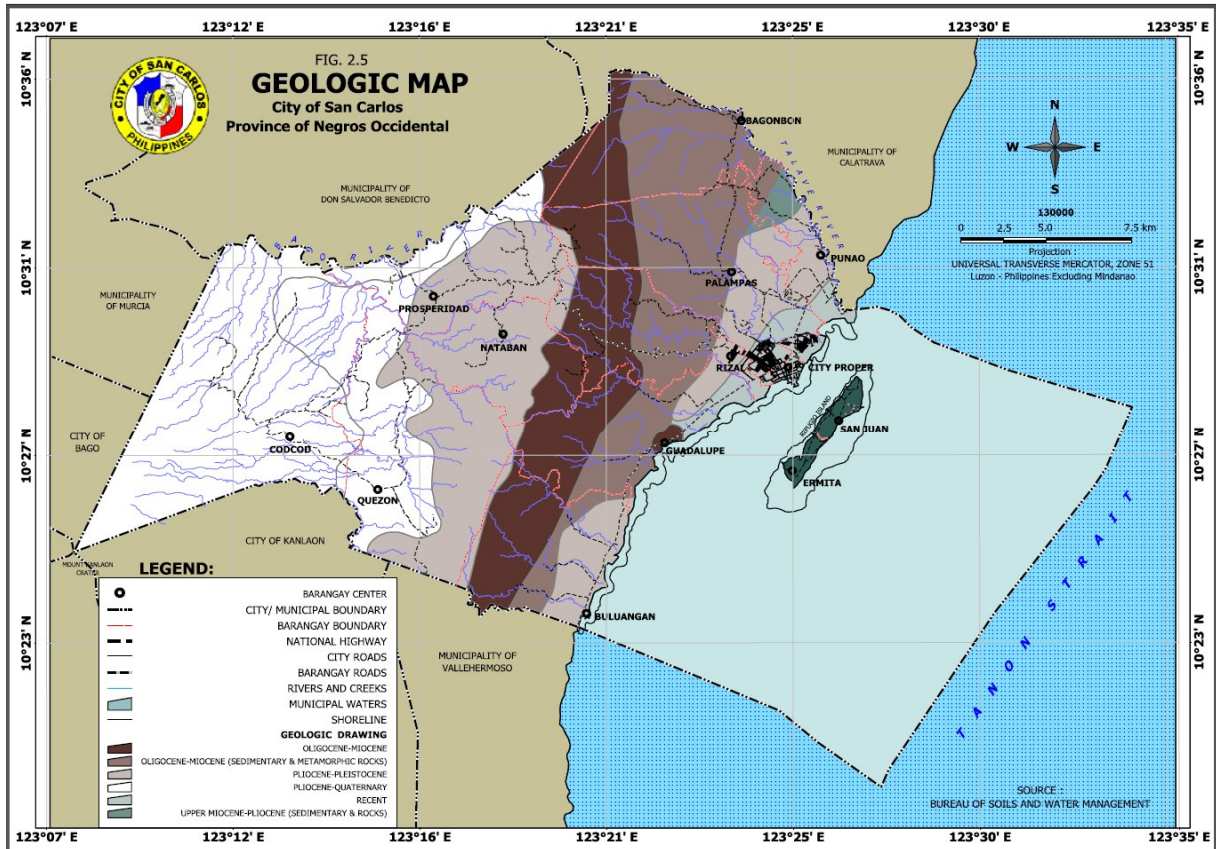


Figure 2.4.2: Geology

2.4.3 Hydrologic Features

There are eight (8) major rivers in the City. These are the Talave, Palampas, Andoon, Gignalman, Mainit, Katingal-an, Sta. Cruz and Bulungan Rivers. The Talave and Palampas rivers and their tributaries emanate from the western slopes of the forest reserve area and drain to Tañon Strait. On the other hand, the Sta. Cruz and Bulungan rivers originate from the western slope of Mt. Kanlaon and also drains towards Tañon Strait.

Aquifers in the coastal and river deposits (coastal segments of barangays Punao, Rizal, Guadalupe, Poblacion, Bulungan) are made up of clay, silt, sand, gravel and organic remains. Potential saturated thickness during the rainy season may be as thick as ten (10) meters. The average thickness of the unconfined unconsolidated aquifer may not exceed five (5) meters.



Most of its water discharges to surface drainage and to the air through plants and trees. There is a high possibility of encountering salt water if wells will be dug in these areas.

2.4.4 Soil Classification

Soils in the City's mountainous areas are classified as Rough Mountainous Land while the valley of barangay Prosperidad and Nataban are of Guimbalaon Loam. On the other hand, the sloping portions of barangays Buluangan, Guadalupe, Rizal, Palampas and Punao are of Faraon Clay (steep phase) while most of the City's coastline is of Isabela Clay. Soils on Refugio Island are of Faraon Clay.

2.4.4.1 Soil Map

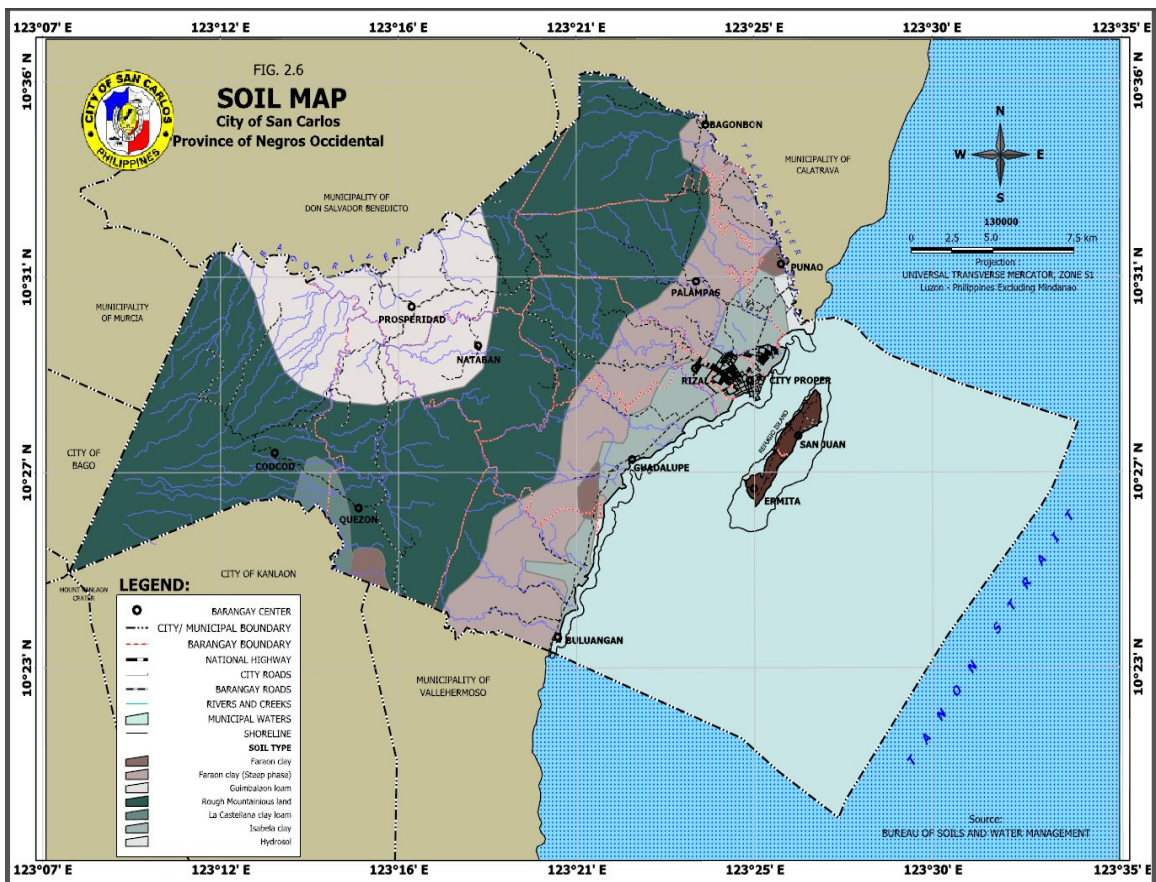


Figure 2.4.4.1: Soil Map



2.4.5 Climate

There are basically two (2) pronounced seasons in the area, the wet and dry season which determine the agricultural activity patterns i.e. harvest time for crops. The dry season begins in December and extends until early May while the wet season starts in June climaxing in September, and finally ending in October.

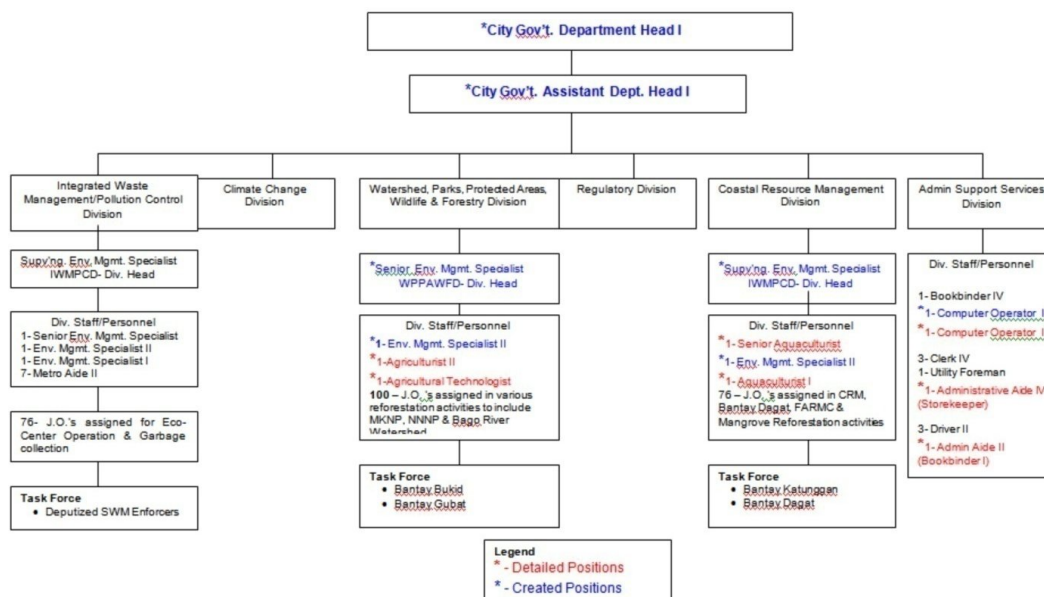
San Carlos City, typical to other Negros island LGUs, belongs to Type III climate based on the Modified Coronas Classification of Philippine climate. Type III climate has “no very pronounced maximum rain period with a dry season lasting only from one to three months, either during the period from December to February or from March to May.”

3. CURRENT SOLID WASTE MANAGEMENT CONDITIONS

3.1 Institutional Arrangement

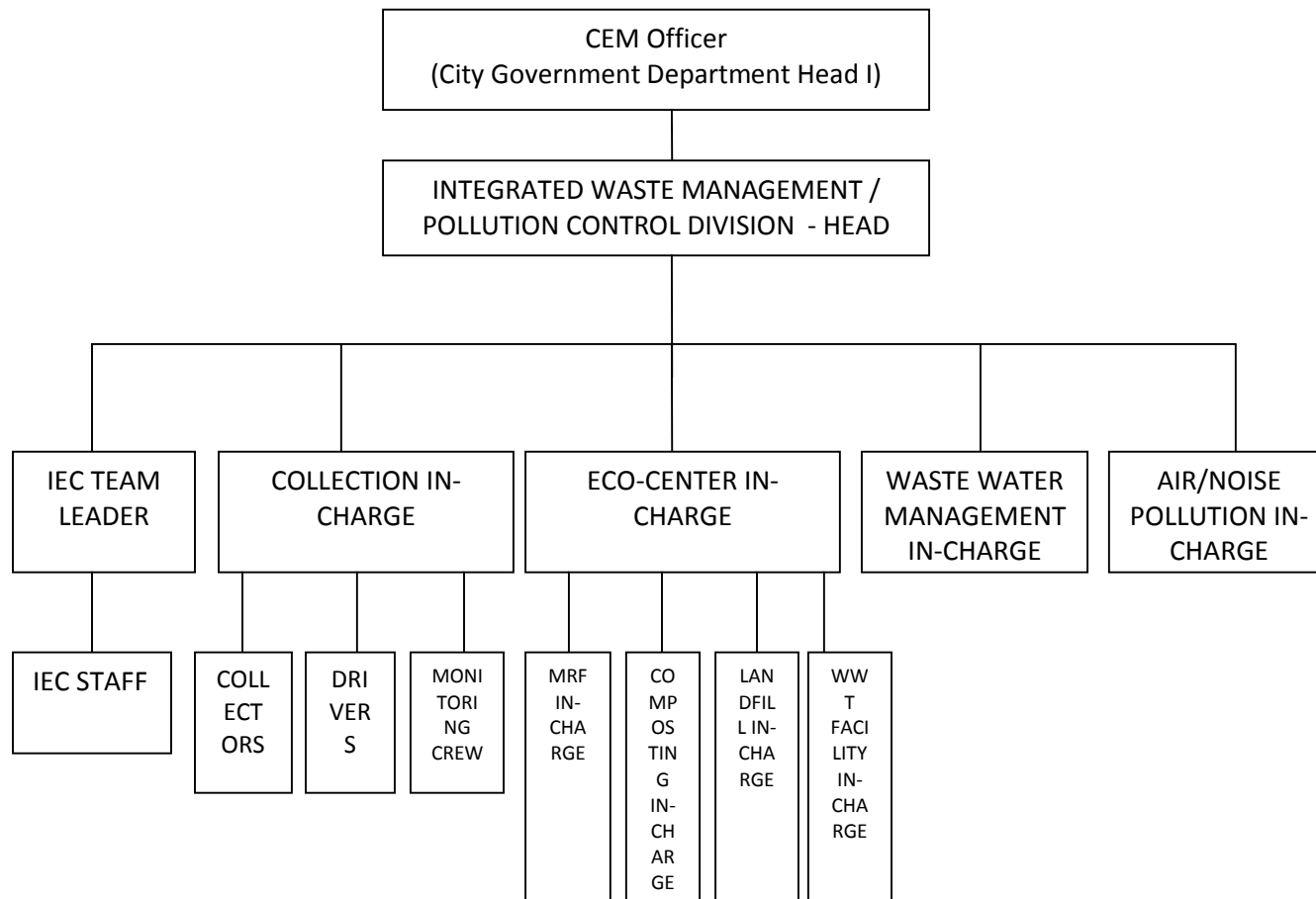
The Integrated Waste Management Pollution Control Division under the City Environment Management Office is responsible in handling the entire waste management activities to include but not limited to garbage collection, processing and land filling operation, city street sweepers and IEC program initiatives. The City Environment Management Office was created through Ordinance No. 13-01.

3.1.1 City Environment Management Office Organizational Structure





3.1.2 Integrated Waste Management/Pollution Control Division Organizational Structure



3.2 Inventory of Equipment and Staff

3.2.1 List of Existing Equipment

Types of Equipment	Year Model	Capacity	Location	Status
1. Garbage Truck with Compactor # SFS 472	2001	6 Tons	Morning Shift – Route #3 Afternoon Shift – Route #4	Operational
2. Garbage Truck with Compactor # SLC 524	2012	3 Tons	Morning Shift – Route #2 Afternoon Shift –	Operational



			Route #5	
3. Garbage Truck with Compactor # RGN 968	1991	2 Tons	Morning Shift – Route #1 Afternoon Shift – Route #6	Operational
4. Garbage Truck with Compactor # SHW 535	1993	4 Tons	Reserve (Stand by Truck)	Operational
5. Open Dump Truck # SHX 201		4 Tons	Special (Urban Brgys.)	Operational
6. Open Dump Truck # SAW 720			Eco-center	Operational
7. Utility Vehicle – CANTER 4WD # SGE 967	2004	4 Tons	18 Barangays	Operational
8. CHANGAN #SHN 800	2006		Special (Urban Brgys.)	Operational
9. MULTICAB (DUMP TYPE) # SJC392	2002	0.7 Tons	Reserve (Stand by Truck)	Operational
10. Service Vehicle MULTICAB #SGU 912	2004	1 Ton	18 Barangays	Under Repair
11. TMX125 Motorcycle #SN1089	2004	50 Kgs.	Urban Barangays	Under Repair
12. Shredder	2005	4 Tons /Hour	Eco-center	Operational
13. Shredder	2005	1 Ton /Hour	Eco-center	Operational

Table 3.2.1: List of Existing Equipment

3.2.2 List of Existing Office Equipment

Types of Office Equipment	Date Acquired	Amount	Location	Status
1. Epson FX2175 DOT-Matrix Printer	August 4, 2014	20,898.00	City Hall Office	Operational
2. Multi-Media Projector	July 28, 2014	20,000.00	City Hall Office	Operational



3. Intel Core i3 Personal Computer	July 10, 2012	22,340.00	City Hall Office	Operational
4. Intel Pentium Dual-Core Personal Computer	September 20, 2010	21,750.00	City Hall Office	Operational
5. Intel Pentium 156HZ Personal Computer	July 11, 2007	31,292.50	City Hall Office	Operational
6. IBM Thinkpad R51e Intel Celeron M380 Level 2 Cache	May 2, 2006	56,800.00	City Hall Office	Operational

Table 3.2.2: List of Existing Office Equipment

3.2.3 List of Existing Office Personnel

Integrated Waste Management/Pollution Control Division Staff of CEMO	Person In-Charge	No. of Personnel	Employment Status
1. City Environment Management Officer - OIC	Engr. Loreto C. Sanchez	1	Permanent
2. Environmental Management Specialist II	Engr. Arthur A. Batomalaque	1	Permanent
3. Bookbinder IV/IEC Team Leader	Marietta F. Lomocso	1	Permanent
4. Clerk IV/ IEC Staff	Analou F. Gomo	1	Permanent
5. Utility Foreman/Eco-Center In-charge	Emmanuel C. Blanco	1	Permanent
6. Garbage Truck Drivers	Ernesto F. Guillen, Luciano Canete,	2	Permanent
7. Garbage Collector	Edgar Maniegos	1	Permanent
8. Garbage Collectors	Ceferino B. Oficiar, Jr.	25	Job Order Laborers
9. Monitoring Crew	Neron Cabatas, Juanito Villarosa, Leonardo Losbanes	3	Permanent
10. Monitoring Crew	Ceferino B. Oficiar, Jr.	4	Job Order Laborers



11. Eco-Center laborers	Emmanuel C. Blanco	30	Job Order Laborers
12. Street Sweepers	Marietta F. Lomocso	56	Job Order Laborers

Table 3.2.3: List of Existing Office Personnel

3.3 Source Reduction

With the implementation of the City Ordinance No.14-53, an Ordinance regulating the use of plastic sando bags as packaging materials and utilization of polystyrene, commonly known as styrofoam, for food and beverages container, the usage of such plastic products will be controlled and regulated

The household/residential, commercial, industrial, institutional, market sources are required to segregate their solid waste into biodegradable, non-biodegradable, toxic and hazardous wastes. The households are currently practicing segregation at source and waste diversion through the application of the 3R’s (Reduce, Reuse & Recycle). The upland and island barangays were likewise initiating composting for their bio wastes.

The city also initiated the “Search for the Most Environment Friendly Market Vendor in line with the advocacy program relative to the Plastic Ordinance and continued conduct of school and barangay contests annually to promote waste reduction.

3.4 Collection

The City Environment Management Office is responsible for the collection and disposal of all residential, commercial, yard and bulky wastes. The city imposed a **“No Segregation, No Collection”** policy to implement segregated waste collection.

The daily waste collection schedule (except for 2nd and 4th Sunday of the month) is from 5:30in the morning up to 1:30in the afternoon on the first shift and from 2:30in the afternoon up to 10:30in the eveningon the 2ndshift. There are six (6) collection routes within the city proper (8 barangays in the poblacion with only one (1) truck assigned per route and a Multicab vehicle for special waste collection which cater hospitals, slaughterhouse, etc., while the collection for eight (8) upland and coastal barangays and the two (2) island barangays of Ermita and San Juan are arranged on convenient schedule on a monthly basis.

Household and commercial wastes in the city are usually left in waste bins/containers or in waste bags (cement sacks) prior to collection. However, residents must coordinate with the garbage collectors and must follow the “no segregation, no collection policy” of the city. For non compliance with the segregation policy, the sanction is that there garbage will not be collected.



Ideally, residents must bring their trash to the garbage truck making stops at frequent intervals around each route. The garbage collectors will indicate their availability or presence by ringing a distinctive bell or horn.

3.4.1 Truck Route

ROUTE NO.	TIME	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	REMARKS
1	5:30 until 8:30 (1st trip)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	
	9:00 until 10:30 (2nd trip)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	
2	5:30 until 10:30	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	GUADALUPE / G.K. FRI NON-BIO /SAT BIO
3	5:30 until 10:30	BIO (MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	
4	2:30 until 8:30	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	
5	2:30 until 8:30	BIO (MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	BIO (MALATA)	NON-BIO (DILI MALATA)	
6	2:30 until 6:00 (1st trip)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	BIO (MALATA)	
	6:30 until 7:30 (2nd trip)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	NON-BIO (DILI MALATA)	

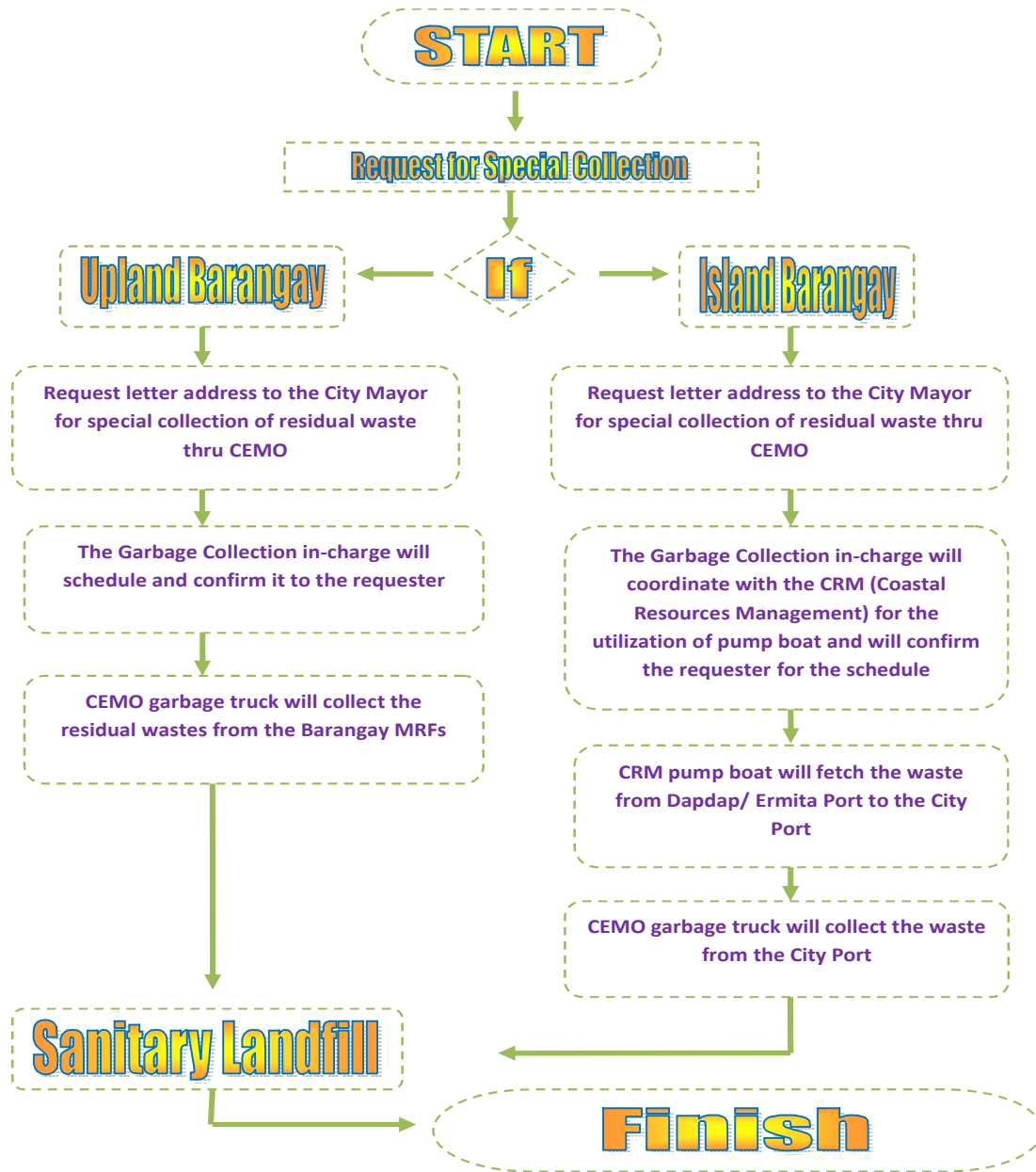


ROUTE 1		ROUTE 2		ROUTE 3		ROUTE 4		ROUTE 5		ROUTE 6	
1	OLD TERMINAL LOCSIN ST. TO SUMAKWEL BROCE / MONDRAGON	1	SOUTH VILLA - PHASE 3	1	CITY HALL	1	CALUMPANG	1	NEW TOWN	1	GAISANO
						2	ST. JOHN			2	NATIONAL HI-WAY
2	BROCE / MONDRAGON	2	ROVIRIH HEIGHTS SUBD.	2	CENTER MALL	3	CITIHOMES	2	ST. LUKE	3	AZCONA ST. (RMES)
						4	CAMPO SIETE			4	CORNER BROCE / LOCSIN ST.
3	CARMONA PETRON - CENTRAL GATE	3	GREENVILL E SUBD.	3	GAMBOA SHOP/VRES CO/LTO	5	SAN JUAN BONIFACIO CABALLERO SUBD.	3	SAFECA	5	PUBLIC MARKET (VALDEVI A MEDINA)
4	GUSTILO ST. (END TO ONE-WAY)					6	CORNER BROCE /			6	GUSTILO ST.
5	LOCSIN ST.	4	ST. RITA HOMES	4	EMERALD	7	AZCONA (DUEKSAM) SOLIDARIOS COMP.	4	VILLARA NTE VILLAGE	7	LOCSIN ST. (STO. NINO, WOMEN'S)
						8	D'REC PRESS PORTUGUEZ COMP.			8	CITY HOSPITAL
6	RIZAL	5	ALGERS COMMUNIT Y	5	SOUTH VILLA I & II	9	D'REC PRESS PORTUGUEZ COMP.	5	SEASIDE VILLAGE	9	AZCONA ST.
7	YLAGAN BAYBAY (MOSQUERA)					10	GUSTILO ST.				
8	CARMONA (CNC)	6	VILLA CONSUELO - PHASE II	6	SAN JULIO SUBD.	11	BURGOS ST.	6	GEMILIN A	10	GUSTILO ST.
9	RELOCATIO N SITE					11	SANDOC				
10	CITY PORT	7	URBAN - I, III , IV	7	TEACHER'S VILLAGE	12	LUZURIAGA ST.	7	ST.CHAR LES	12	PUROK KAMAGON G
11	BURGOS					13	YLAGAN TAÑON / EXT.			13	PUBLIC TERMINAL - BAGSAKA N
		12	PAROLA	8	MARGARIT A VILLAGE	8	TSES	8	ST.VINCE NT	14	PUBLIC PLAZA
13	LOCSIN ST. (NOVO RT.)	15	V. GUSTILO (DUEKSAM TO GARDEN OF SAINTS)							15	CD - CARMONA (CENTRAL)
14	ANTONIO AVE. (POLICE STATION, BJMP)	9	DON JUAN SUBD.	9	RMES	16	HOPE	9	MOLAVE	16	YLAGAN (Y.C.T.)
15	PEOPLE'S PARK					17	SAN JUAN ISLAMIC / TUNGA			17	DEP-ED GATE
16	ARANETA	10	GUADALUP E PROPER	10	JLNHS	18	BULANGAN	10		18	
17	H.C. RIGOR					19	NEW ERA			19	
18	REMEDIOS DOS	11	GAWAD KALINGA			20	DEBULGADO			20	
19	HERMANOS					21	VIRONE / ENDRINA			21	
20	VALDEVIA - MEDINA										

Table 3.4.1: Truck Route



3.4.2 Flowchart of Request for Collection of Wastes (Upland and Island Barangays)





3.5 Transfer Station

There is no necessity at the moment to have a transfer station since the city's garbage collection team logistics is adequate to cope up with the current collection rate of 17 tons per day. However, the province is looking into the possibility of making San Carlos City as the drop off points of residual plastics coming from the different LGU's under the existing partnership with HOLCIM in the co-processing of residual plastics

3.6 Processing Facilities

The upland and island barangays are responsible for the segregation and collection of recyclable and biodegradable wastes which are processed and stored in their respective centralized material recovery facilities (MRF's). The residual wastes are temporarily contained at their residual containment area (RCA) which will be collected by the city and disposed at the Sanitary Landfill.

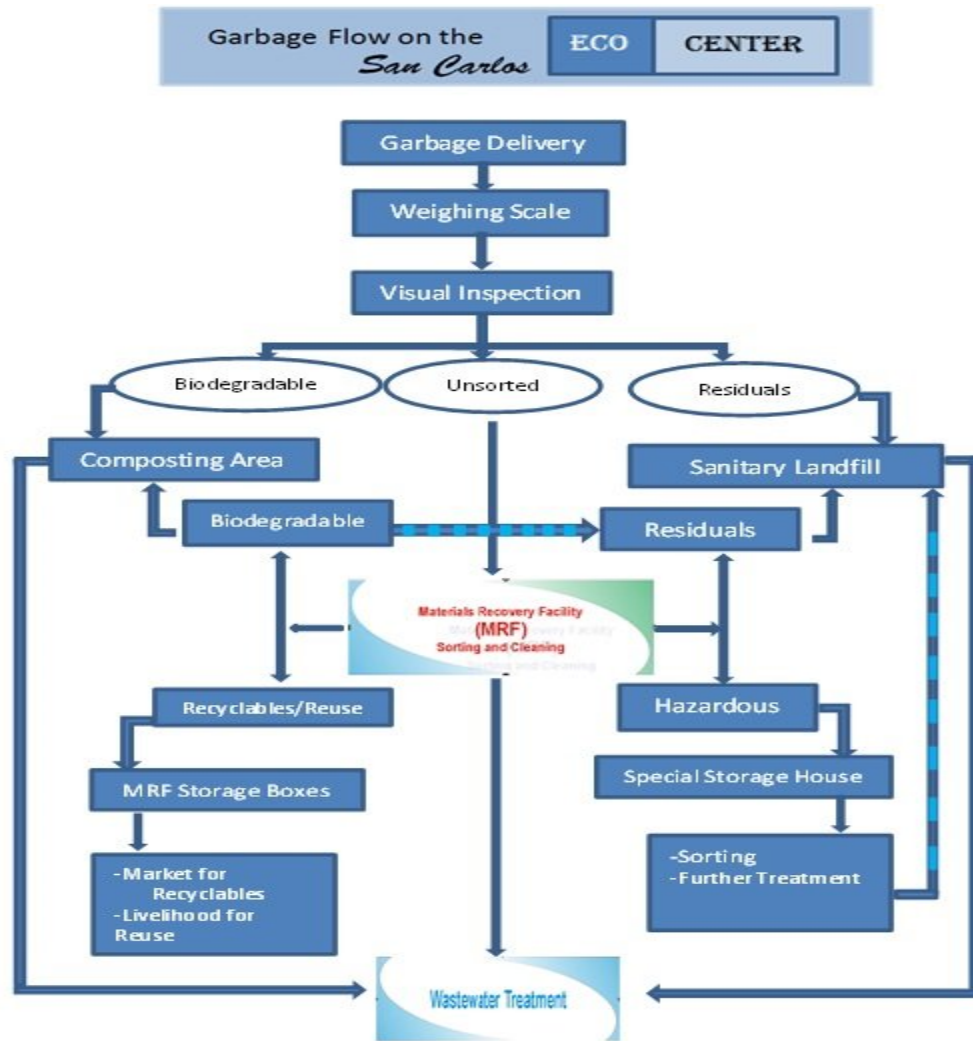
For the urban barangays, the collection of biodegradable and non-biodegradable wastes were collected every other day and processed for recycling and composting.

The Central Material Recovery Facility (MRF) is one of the vital facilities located at the Eco-Center which accepts and process wastes from the poblacion/urban centers. The biodegradable/green wastes are being shredded and transferred to the windrow and vermi composting areas allowing natural process of decomposition. The non-biodegradable wastes materials were being sorted to further extract recyclables and sando bags while residual waste fraction is being disposed in the sanitary landfill.

However, for the contaminated residuals collected from the upland, coastal and island barangays will be disposed directly to the sanitary landfill. *(See garbage processing flow)*



3.6.1 Garbage Processing Flow



* See independent Flow Chart for the Eco-Center
** Due to non 100% Segregation



3.6.2 Barangay-based Material Recovery Facility

BARANGAY	NO. OF MRF	STATUS
I	1	Operational
II	0	
III	1	Not Operational
IV	0	
V	0	
VI	1	Not Operational
RIZAL	2	Operational
PALAMPAS	6	Operational
PUNAO	4	Operational
BAGONBON	6	Operational
GUADALUPE	10	Operational
BULUANGAN	7	Operational
CODCOD	4	Operational
QUEZON	8	Operational
PROSPERIDAD	6	Operational
NATABAN	1	Operational
SAN JUAN	1	Operational
ERMITA	1	Operational

Table 3.6.2: Barangay-based Material Recovery Facility

3.7 Final Disposal

3.7.1 Sanitary Landfill Operation

The Sanitary Landfill (SLF) is one of the vital facilities of the Eco-Center. It located in Sitio Mabuni, Barangay Guadalupe and was constructed based on the guidelines and technical specifications set by the implementing rules and regulations (IRR) of R.A. 9003. The said landfill belongs to category 2, based on NSWMC guidelines carrying less than 75 tons of net residuals. Based on the said specifications, the City has adopted a cost efficient construction method utilizing clay liner on site in lieu to expensive imported high density polyethylene (HDPE) liner and designing an innovative biological waste water treatment facility utilizing the natural slopes to minimize the use of pump and other power driven gadgets.



The planting of trees and other vegetations along the perimeter of the facility served as natural buffer and likewise improving the landscape, aesthetics and efficiency of buffering the SLF. The designed cell is being constructed and be filled up accordingly based on the projected volume referring to WACS output. The design and construction of earth bank is likewise carefully considered that contributed to the stability of the existing landfill facility.

A landfill cell development plan is being designed to cater projected volume of residuals in such manner that it will include the scheduling of residual wastes dumping per cell, proper benching during operation in order to further enhanced stability.

A storage area has been provided for special wastes (toxic and hazardous waste) generated from health care facilities, hospitals and other generators has been operational. Information data base has been installed to regularly update information on the quality and quantity of waste stored and diverted, hence record keeping of the Eco-center's receipt, dispatch and disposal of waste has been regularly monitored and updated.

There were regular trainings and upgrading of personnel to effectively and efficiently operate the sanitary landfill. A training on occupational health and safety to SLF personnel was also conducted which subsequently followed by the formulation of a Manual on occupational health and safety highlighting specific guidelines and protocol to be observed and followed for the safety of the workers. At present, a study has been considered making the operation of SLF as an economic enterprise while simultaneously undertaking cost recovery mechanisms. Such cost recovery measures has been initiated to support the possible enterprising activity, a scenario wherein neighboring municipalities could avail of the services of the Sanitary Landfill for an equivalent tipping fee without compromising its primary services to San Carlos City thru City Ordinance No. 15-01 "An Ordinance Establishing the Solid Waste Management Cost Recovery Mechanism of the City Government of San Carlos Through Charging of Tipping Fee for its Sanitary Landfill Services in the City's Eco-Center Waste Processing Facility".

3.7.2 Situation of the Scavengers at the Closed Dumpsite

With the closure of the old dumpsite, the city did not forget the scavengers that made their living through the recyclables they recover out from the wastes that were being dumped by the city's garbage trucks and by other private entities. Instead five (5) of them were employed as job order and were assigned at the city's eco-center. The remaining displaced families benefited livelihood support from the Special Project for Livelihood Management Office (SPLMO) of the city wherein they were given a seed capital to start their individual small business.



3.8 Special Wastes

The city is responsible in the collection and storage of toxic, hazardous and pre-treated hospital wastes at the Eco Center utilizing a high density plastic container sealed with concrete. However, recyclables extracted for some of the selected hazardous waste (e.g. used batteries, used oil, etc.) will be brought to appropriate and competent recyclers and junkshop operators for proper treatment.

3.9 Markets for Recyclables

3.9.1 Name of the Association of the Junkshop Operators

The Junkshop Association of San Carlos City, Negros Occidental was formally organized and duly accredited by the City of San Carlos on September, 2013. It was basically organized to address the required composition of the SWM Board to include the recycling industry wherein junkshop operators has been considered as this particular sector has a major role in the diversion of wastes

3.9.2 List of City Junk Shops to include types of recyclable materials

Junkshops	Items	Price (as of February 1, 2015)
1. Opon Junkshop	Carton	₱ 1.50 / kilo
2. A&C Junkshop	Newspaper	₱ 4.50 / kilo
3. Tala Junkshop	Plastics	
4. Garing Junkshop	Injection	₱ 10.00 / kilo
	Blowing	₱ 10.00 / kilo
	Mineral water	₱ 10.00 / kilo
	Disposable cups, spoons & forks	₱ 8.00 / kilo
	Monobloc chairs	₱ 10.00 / kilo
	Metals	
	Aluminum-pots & pans (kaldero)	₱40.00 / kilo
	Aluminum cans	₱ 35.00 / kilo
	Hard Alum. (heavy alloy)	₱ 45.00 / kilo
	Jalousies (light alloy)	₱40.00 / kilo
	Steel (puthaw, scrap metal)	₱ 9.50 / kilo



	Brass	₱ 30.00 / kilo
	Copper	₱ 30.00 / kilo
	Zinc	₱ 45.00 / kilo
	Stainless steel	₱ 40.00 / kilo
	Lead washer (tingga)	₱ 9.00 / kilo
	G. I sheet (yero)	₱ 7.50 / kilo
	Tin cans (lata)	₱ 3.50 / kilo
	Bottles	
	UFC catsup	₱ 0.50 / pc.
	Silver Swan (big) mallorca	₱ 0.50 / pc
	Beer bottle	₱ 0.50 / pc
	Grande/Mucho beer	₱ 1.00 / pc
	Lapad (tanduay) jr.	₱ 0.75 / pc
	Lapad (tanduay) regular	₱ 0.75 / pc
	Lapad (tanduay) long	₱ 1.50 / pc
	Emperador lapad	₱ 0.50 / pc
	Emperador long	₱ 1.00 / pc
	Vino Kulafu	₱ 0.50 / pc
	Softdrinks (litro)	₱ 0.50 / pc
	Softdrinks (8 oz.)	₱ 0.50 / pc
	Batteries	
	7 plates	₱ 250.00 / pc
	9 plates	₱ 450.00 / pc
	11 plates	₱ 500.00 / pc
	15 plates	₱ 800.00 / pc

Table 3.9.2: Price Quotation

3.9.3 Industries in the City that use Recycled Materials

The San Carlos Biopower, Inc., is one of the promising industry of the city with a generation capacity of 18 MW supplying baseload electric power to the local grid. The major bio-mass feedstock requirement of the plant will be sugarcane thrash or commonly known as “bagasse”, wastes residues typically left in the fields after sugar cane harvest and likewise energy crops from dedicated energy crop plantations. As of the moment, the plant is on the construction phase however, the management of the bio-mass power plant started already accumulating sugar cane trashes with a projected thousands of hectares of sugar cane plantation covering not only San Carlos City but to the entire district of Negros Occidental as to preparation for the future plant operation.



3.10 Information, Education & Communication (IEC) Campaign

3.10.1 Information, Education & Communication (IEC) Program

The Local Government of San Carlos City in partnership with the Global Environment and Nature Ecosystems Society (GENESYS) Foundation implemented a massive Five (5) Years city wide Information, Education and Communication (IEC) campaign covering the entire 18 barangays comprising the lowland urban barangays which commenced on October 17, 2002 through a memorandum of agreement (MOA).

The target participants in the conduct of IEC were the Sangguniang Barangays, households, business establishments, institutions, religious institutions and other areas identified during the course of the campaign implementation. The conduct of the massive IEC was implemented in accordance with the Implementing Rules & Regulations (IRR) set in the R.A. 9003 and its methodology designed to advocate and reach as to many citizens as possible and be oriented in the mechanics of ESWM.

Stressed out in the campaign was the need for a serious and sincere “lifestyle change” that will ease and overhaul personal and societal practices that contribute to the generation and mismanagement of waste in the households, businesses and institutional establishments. At present, the trained staff from the Genesys Foundation, Inc. were integrated in the City Environment Management Office to ensure the sustainability through the institutionalization of the IEC program.

3.10.1.1 Training Modules

The project training modules were patterned after those developed by the Solid Waste Association of the Philippines (SWAPP), adapted to the San Carlos environs and viewed through PowerPoint presentations and other alternative IEC materials developed such as flip charts to those rural and hinterland areas of the city that does not have electricity.

During the conduct of the massive campaign, two (2) training modules were prepared: The “Orientation Seminar on Ecological Solid Waste Management” and the “Barangay Planning Workshop Seminar”. These modules were used to train the project staff, barangay councils, solid waste management board and the other participants for the information, education and communication campaign (IEC).



There were also cross visits, song composition with themes on ecological solid waste management and its practices, documentation on best practices within the local barangays, ESWM exhibits and training impact sharing and other structured learning exercises were incorporated into the module to further enhance the trainings.

3.10.1.2 IEC Campaign Materials

There were two fliers developed during the course of the campaign. The first discussed about the ecological solid waste management and its principles. The second flier discussed about the application of composting principles, especially for the household kitchen waste. These materials were distributed to the Sangguniang Barangay and to all other stakeholders and target groups that underwent the ESWM trainings.

Posters were also utilized with similar advocacy relative to ESWM information drive and posted around strategic areas in the city e.g. market, LGU offices, schools, churches. Similarly, banners with five (5) different information on ESWM were installed in various public places and were likewise distributed to participating barangays for posting in strategic areas.

3.10.1.3 Barangay Training on Ecological Solid Waste Management (ESWM)

The Barangays were given training/seminar workshop with 30 participants per barangay. These comprises the whole Sangguniang Barangay, Secretary, Treasurer, Day Care Worker, Barangay Health Worker and selected tanods, purok leaders and point or model households of the barangay. The training enabled them to formulate the barangay's vision/mission statements, which will be incorporated in the barangay plan.

Each barangay was provided with a "Barangay Training Manual on Ecological Solid Waste Management" that contains pertinent information and references useful for planning and implementing ESWM.

The various cross visits and study tours that was facilitated to the identified target groups during the campaign had provided exposures vis-à-vis best practices and other exemplary waste management for possible replication in their respective barangays.



3.10.1.4 The House to House Information, Education and Communication (IEC) Campaign Strategy

The house to house campaign was conducted through the facilitation of household profile survey questionnaire to each households with additional fliers used as teaching aides for each household’s easy reference.

The profile survey reveals that majority (92 %) of the respondents were actual domicile owners, occupants or their immediate family members and there were about 4,922 households equating to 88% of the city populace that was reached during the campaign

3.10.1.5 Participatory Technology

The local government recognized that success of solid waste management does not just lie on the technical methods in disposing of waste or “end of the pipe solution”. Thus, people’s involvement and participation were utilized wherein all sectors of the community has been targeted to be agent of change to comply source reduction and attained greater waste diversion. The stakeholder’s participation is very crucial to attain higher compliance of the solid waste management law. This is to include but not limited to the private/industrial/agricultural sector, the schools, the eighteen barangays, and all households..

3.10.2 List of IEC Activities (2014)

IEC ACTIVITIES	MESSAGE	TARGET AUDIENCE
Brgy. Re-orientation on RA 9003	Review of the RA 9003 specifically on the role of the barangay	Barangay Council
World Water Day Celebration	Encourage stakeholders for the conservation of water and it’s sources	Barangays, Schools
Observance to Earth Hour	Promote energy conservation likewise decreasing greenhouse gas that contribute to climate change issues	Barangays, Schools, Commercial Establishments
International Earth Day Celebration	Promote and raise awareness relative to the activities on the mitigation of climate change	Barangays, Schools, Commercial Establishments
Barangay Clean-up of 18 Barangays	Finding possible solutions to the improper waste disposal of the constituents of the respective barangays	Barangays
Lakbay Aral to Bago City	Prepare possible enforcers on the actual procedure of the enforcement of the environmental laws	CEMO Staff, Barangays, SCC Law Enforcement Team members



Environment Week Celebration	Raise awareness on the environmental programs of the city	Barangays, Schools, Commercial Establishments
Wildlife Month Celebration	Increase the responsiveness to the flora and fauna within the island of Negros	Barangays, Schools, Commercial Establishments
Paralegal and Enforcement Training Workshop (C.O. No. 8, Series of 2012)	Train and equip the enforcers with the proper protocol on the enforcement of the environmental laws of the city	CEMO Staff, SCC Law Enforcement Team members, Barangays
Massive IEC Campaign relative to City Ordinance No. 12-08, 14-53 and 14-63	Raise awareness on the environmental laws of the city specifically on its prohibitions and its fines and penalties	Barangays, Schools, Commercial Establishments
Conduct of the Search for the Most Environment Friendly Barangay	Promote a sustainable pro-environment programs within the barangay together with its constituents	Barangays
Conduct of the Search for Sustainable and Eco-friendly School	Promote a sustainable pro-environment programs within the school and its neighboring communities	Schools
Conduct of the Search for the Most Environment Friendly Market Vendor	Reduction of plastic sando bags as packaging materials for fish and meat	Market

Table 3.10.2: List of IEC Activities (2014)

3.11 Costs and Revenues

3.11.1 Annual Budget for SWM (2013, 2014, 2015)

Budgetary Items	2013		2014		2015	
	Amount	Fund Source	Amount	Fund Source	Amount	Fund Source
1. Sanitation & Environmental Protection Program (Garbage Collection and other Related Works)	₱5,173,200.00	20 % D F	₱6,200,000.00	22 % D F	₱6,200,000.00	30 % D F
2. Eco - Center Project Operation	3,194,940.00	20 % D F	3,500,000.00	22 % D F	3,500,000.00	30 % D F



3. Environmental IEC-Citywide Barangays and Schools Environmental Awareness and Capacity Building	976,000.00	20 % D F	1,475,000.00	22 % D F	2,000,000.00	30 % D F
4. Sanitation and Environmental Protection Program- (Maintenance of City Lanes and other related activities)	3,749,000.00	20 % D F	4,500,000.00	22 % D F	4,500,000.00	30 % D F
T o t a l	₱13,093,140.00		₱15,675,000.00		₱16,200,000.00	

3.11.1 Annual Budget for SWM (2013, 2014, 2015)

3.11.2 Expenditures for the Previous Year (2014)

GARBAGE COLLECTION

ITEMS	AMOUNT IN THE PROGRAM OF WORKS	EXPENDITURES	SURPLUS
Labor	3,295,750.00	3,159,510.46	136,239.54
Meal Allowance	102,000.00	96,318.18	5,681.82
Repair and Maintenance	350,000.00	317,142.50	32,857.50
Repair and Maintenance (tires, batteries and accessories)	300,000.00	177,885.03	122,114.97
Fuel, Oil and Lubricant	2,122,250.00	1,513,630.73	608,619.27
Contingency	30,000.00	30,000.00	0
TOTAL	6,200,000.00	5,294,486.90	905,513.10

3.11.2 Expenditures for the Previous Year (2014) – Garbage Collection



ECO-CENTER PROJECT OPERATION

ITEMS	AMOUNT IN THE PROGRAM OF WORKS	EXPENDITURES	SURPLUS
Labor	2,810,750.00	2,794,932.10	15,817.90
Fuel, Oil and Lubricant	369,120.00	244,770.36	124,349.64
Lease Contract	150,000.00	150,000.00	0
Contingency	170,130.00	21,507.00	148,623.00
TOTAL	3,500,000.00	3,211,209.46	288,790.54

3.11.2 Expenditures for the Previous Year (2014) – Eco-Center Project Operation

ENVIRONMENTAL IEC-CITYWIDE BRGYS. AND SCHOOLS ENVIRONMENTAL AWARENESS AND CAPACITY BUILDING

ITEMS	AMOUNT IN THE PROGRAM OF WORKS	EXPENDITURES	SURPLUS
Barangay Level	270,000.00	264,996.00	5,004.00
School Level	350,000.00	220,790.00	129,210.00
Special Events	200,000.00	176,252.60	23,747.40
Fuel, Oil and Lubricant	200,000.00	185,422.46	14,577.54
Repair and Maintenance	100,000.00	95,526.00	4,474.00
Labor	330,000.00	345,114.04	15,114.04
Contingency	25,000.00	25,000.00	0
TOTAL	1,475,000.00	1282873.02	192,126.98

3.11.2 Expenditures for the Previous Year (2014) – IEC

MAINTENANCE OF CITY LANES AND RELATED ACTIVITIES

ITEMS	AMOUNT IN THE PROGRAM OF WORKS	EXPENDITURES	SURPLUS
Labor	4,408,710.00	4,408,455.80	254.16
Fuel, Oil and Lubricant	60,000.00	17,971.15	42,028.85
Contingency	31,290.00	31,290.00	0
TOTAL	4,500,000.00	4,457,716.99	42,283.01

3.11.2 Expenditures for the Previous Year (2014) – Maintenance



3.11.3 Revenues for Previous Year

A total of **Php 365,350.00** (Data taken from the City Treasurer's Office for CY 2014) was generated from garbage collection fee charged from business establishments and other commercial/industrial sources which go directly to the General Fund Account.

3.11.4 Trust Fund Creation

One of the constraints in implementing SWM program for LGU's is funding considerations or how to source out financing for its implementation on a regular basis. The common source of funds is actually taken from the coffers of the development fund which is quite limited due to some budget restrictions and apparently reducing due to a significant number of emerging cities sharing the IRA budget.

In 2007, the city tries to make innovation by establishing a solid waste management trust fund. This trust fund was intended to finance solid waste management projects utilizing income from wastes operation. The source of these funds mainly comes from the sales of recyclables, compost and other potential sources such as cash award incentives from various local, national and international competitions.

However, in 2011, given the new guidelines from the Commission on Audit stipulate that income generated from the abovementioned sources will be treated as income of the city and will go directly to the General Fund.

In 2014, we have generated Php 208,293.79 from the sales of compost and recyclables and Php 610,000.00 from the Cash Award Incentives from various competitions.

3.12 Key Issues

The major key issue of solid waste management facing the community is the impact of Climate Change contributed by excessive green house gas emissions specifically carbon dioxide. The **"would be"** adaptation measures that the local community should strategize in order to cushion its negative impact.

4. WASTE CHARACTERISTICS

4.1 Disposed Waste (from WACS)

The method used in the conduct of waste analysis & characterization study (WACS) is by physical examination through quartering applied in the actual percentage of collected waste. ***Enclosed Table 4.1 and Figure 4.1 for WACS results.***



Waste Source	Total	%	Biodegradable		Recyclable		Food Waste		Total
			Waste in kilograms/day	Percentage (%)	Waste in kilograms/day	Percentage (%)	Waste in kilograms/day	Percentage (%)	
Residential	3,059.85	43.45	1,839.66	44.54	268.23	54.58	10.58	22.35	2,118.47
Market	2,439.87	34.65	1755.02	42.49	108.06	21.99	8.2	17.32	1,871.28
Institutional	817.52	11.61	436.29	10.56	47.05	9.57	0	0	483.34
Hospital	724.59	10.29	99.44	2.41	68.14	13.86	28.56	60.33	196.14
TOTAL	7,041.83		4,130.41		491.48		47.34		4,669.23
% to TOTAL	100	100	58.66	100	6.98	100	0.67	100	66.31

Residual		Special		Others		Inert		Total
Waste in kilograms/day	Percentage (%)	Waste in klgms/day	Percentage (%)	Waste in klgms/day	Percentage (%)	Waste in klgms/day	Percentage (%)	Waste disposed
765.09	47.92	11.2	3.33	2.2	10.38	162.89	38.91	941.38
372.83	23.35	0	0	18.99	89.62	176.77	42.23	568.59
248.48	15.56	16.25	4.83	0	0	69.45	16.59	334.18
210.05	13.16	308.92	91.84	0	0	9.48	2.26	528.45
1,596.45		336.37		21.19		418.59		2372.6
22.67	100	4.78	100	0.30	100	5.94	100	33.69

Table 4.1: Summary of quantity and composition of disposed waste by sector

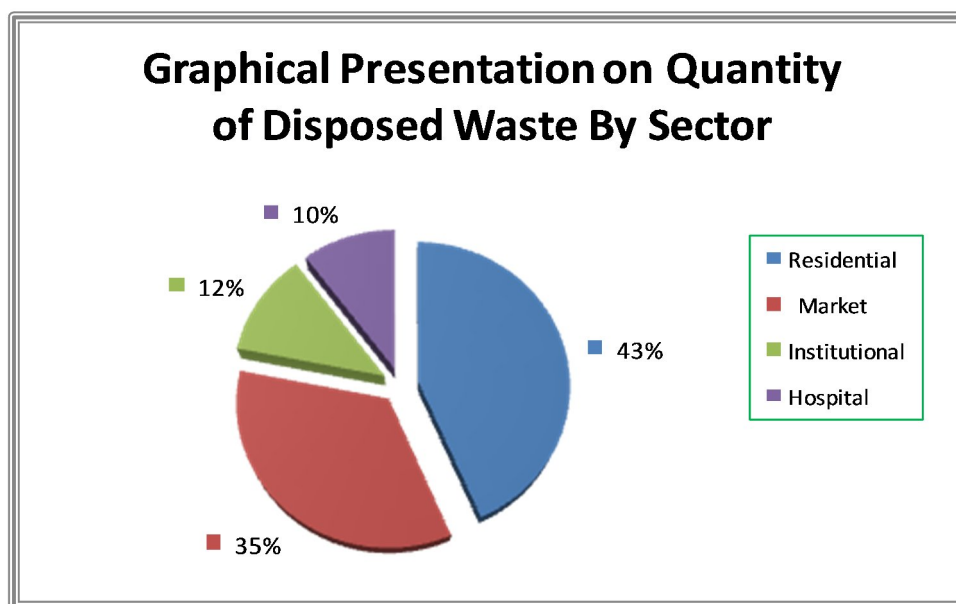


Figure 4.1: Graphical Presentation of Disposed Waste by Sector



4.2 Diverted Waste

The City's total waste diversion in 2014 is at 64.42% wherein the recovery of organic materials, primarily compostable wastes and biomass, remains the single largest component of the City's recycling programs. The recovery of organics constituted 4,058.15 tons or 64.06 percent of the city's total waste generated while the recyclable materials is only at 0.36%. The sales of vermicast and ordinary compost amounted to P45,211.00 while P110,826.48 for recyclable materials in 2014, not to mention the tonnes of compost given for free by the LGU to various government agencies of the City.

Waste Processed	January	February	March	April	May	June
Recyclables / Saleables	2958	719	4889.5	2447	1690.46	1961
Compostable Wastes	328606.5	344595.9	341782.14	354598.35	335799.19	328250.66
Biomass	0	1071	0	4473	4756.5	2646
Hazardous Waste	2842	1624	1657	1650	1850.5	2084
Residuals	238525.9	108799.66	154227.92	197942.91	164865.43	174348.14
Contaminated Bio	26588.35	11622.7	12145.6	11112.4	10939.15	8157.7
Total	599520.7	468432.26	514702.16	572223.66	519901.23	517447.5

July	August	September	October	November	December	Total
1783	2010	1441	2051	757	0	22706.96
350151.656	341561.9	329459.78	312968.35	324224.68	341610.84	4033610
1291.5	2173.5	2992.5	2614.5	1008	1512	24538.5
2093.5	2317.2	1694	793	2094	2416.5	23115.7
184992.304	180043.3	170565.4	188216.69	175618.46	194151.89	2132298
9083.8	11811.7	13030.75	14142.7	12038.5	12668.5	153341.85
549395.76	539917.6	519183.43	520786.24	515740.64	552359.73	6389611

Table 4.2: 2014 Monthly Waste Diversion

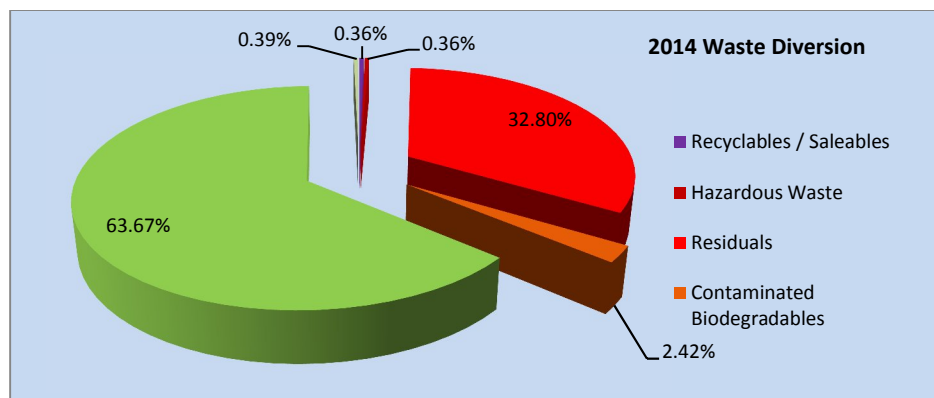
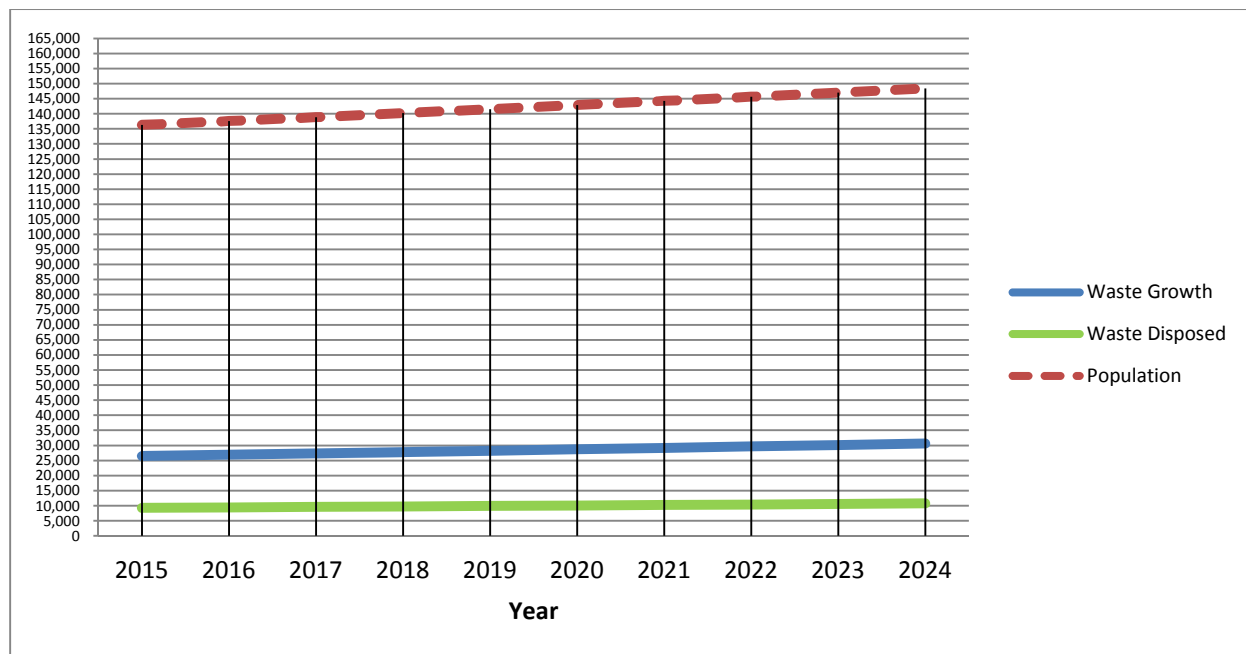


Figure 4.2: 2014 Overall Waste Diversion



4.3 Generated Waste



Graph 4.3: Projected Waste Generation and Disposal Trend

Year	Projected Population	Projected Waste Generation	
		cu.m.	tons
2015	136,279	26,408	6,470
2016	137,574	26,849	6,578
2017	138,881	27,281	6,684
2018	140,200	27,731	6,794
2019	141,532	28,184	6,905
2020	142,877	28,645	7,018
2021	144,234	29,118	7,134



2022	145,604	29,596	7,251
2023	146,987	30,082	7,370
2024	148,384	30,576	7,491

Table 4.3: City of San Carlos Ten (10) Year Solid Waste Projection (2015-2024)

5. LEGAL / INSTITUTIONAL FRAMEWORK

5.1 Local Laws and Regulations

The City Environment Management Office in coordination with various LGU departments specifically the City Engineering Department & the City Health Office jointly implement permitting procedures for solid waste facilities as well as inspection and compliance procedures in accordance with the National Building Code and Sanitation Code of the Philippines (P.D. 856) and other related local ordinances

CITY ORDINANCE NO.	TITLE	STATUS
City Ordinance No. 15-01, Series of 2015	An Ordinance Establishing the Solid Waste Management Cost Recovery Mechanism of the City Government of San Carlos through Charging of Tipping Fee for its Sanitary Landfill Services in the City's Eco-Center Waste Processing Facility	On publication stage
City Ordinance No.14-53, Series of 2014	An Ordinance Regulating The Use of Plastic Sando Bags as Packaging Materials and Utilization of Polystyrene, Commonly Known as Styrofoam, for Food and Beverages Container in the City of San Carlos.	Massive conduct of IEC, Enforcement effective May 1, 2015
City Ordinance No. 13-01, Series of 2013	An Ordinance Creating the City Environment Management Office (CEMO) and Providing for its Tasks, Functions, Personnel and Appropriation Thereof and for Other Purposes	The City Environment Management Office of the city is already in place
City Ordinance No. 08, Series of 2012	San Carlos City Environment Code	Enforcement effective February 1, 2015

Table 5.1: Related Laws and Regulations and their Relevant Provision



5.1.1- Permitting Procedures for Solid Waste Facilities

The CEMO is a member of the Law Enforcement Team (LET) and the Joint Inspection Team (JIT) of the Business Permit and Licensing Office of the city. The primary responsibility being a member of the LET is to enforce the existing laws and ordinances of the city. The JIT is tasked to check and monitor the compliance of the City Ordinance No. 12-08, Section 4E.14 – Prohibited and Punishable Acts # 4, Non-provision of segregated and labeled waste bins in commercial, institutional and industrial establishments, including motorized and non-motorized passenger vehicles and marine vessels (boats, bancas, ferries, etc.), traversing through the territorial jurisdiction of the City of San Carlos.

In this connection, all business permits should pass through the CEMO for inspection as to compliance of the provisions of the above ordinance and also created the Oplan Basurahan that would check the consistency of the compliance of the operators and drivers of the pedicabs, motorcabs, bancas and other public utility vehicles.

As of January 30, 2015, a total of 1,345 pedicab operators; 820 motorcab operators and 930 business establishments complied with the necessary permitting requirements.

5.2 Roles

5.2.1 Roles of the City Solid Waste Management Board

- Updating the City Solid Waste Management Plan, to ensure long-term solid waste management, as well as, integrate the various solid waste management plans and strategies of component barangays;
- Adopt measures to promote and ensure the viability and effective implementation of solid waste management programs in all component barangays
- Monitor the implementation of the City Solid Waste Management Plan, through the component barangays and in cooperation with concerned non-government organizations;
- Adopt specific revenue-generating measures to promote the viability of the Solid Waste Management Plan;
- Convene regular meetings for purposes of planning and coordinating the implementation of the solid waste management plans of component barangays;
- Oversee the implementation of the City Solid Waste Management Plan;
- Review every two (2) years, or as the need arises, the City Solid Waste Management Plan, for purposes of ensuring its sustainability, viability, effectiveness and relevance, in relation to local and international development, in the field of solid waste management;



- Develop specific mechanics and guidelines to implement the City Solid Waste Management Plan;
- Recommend to appropriate local government authorities specific measures or proposals for franchise or build-operate-transfer agreements with duly recognized institutions, to provide, either exclusive or non-exclusive authority, for the collection, transfer, storage, processing, recycling or disposal of city solid waste;
- Provide the necessary logistical and operational support to component barangays
- Recommend measures and safeguards against pollution and the preservation of the natural ecosystem;
- Coordinate the efforts of component barangays in the implementation of the City Solid Waste Management Plan;
- Call on any concerned agency or sector, as it may deem necessary, for support or other appropriate

5.2.2 Roles of the City

- Efficient collection, proper transfer and transport of wastes
- Efficient management of residuals and of final disposal facility

5.2.2 Role of the Barangay

- Resource recovery, recycling and reuse, and composting of wastes at the barangay level;

5.2.3 Roles of Stakeholders

- Minimization of wastes generated at source;
- Segregation at source

5.3 City Solid Waste Management Board

5.3.1 Creation of the City Solid Waste Management Board

The Solid Waste Management Board is the policy making body which sets the overall solid waste management program thrust geared towards the institutionalization and ensures sustainability of its operation in accordance with the City's (10) Year Solid Waste Management Plan which is in harmony with the provision of R.A. 9003 and other environmental related laws.



On February 14, 2002, the Local Chief Executive passed an Executive Order No. 9, Series of 2002 for the creation of the San Carlos City’s Solid Waste Management Board and was further amended re: membership of its composition by Executive Order No. 13, Series of 2006; 76, Series of 2010; 31, Series of 2011 and 21, Series of 2011.

5.3.2 Members of the SWM Board

- City Mayor, Chairman
- City Administrator
- Managing Director, SCDBI
- Executive Director, GENESYS, Foundation
- Chairman, S.P. Committee on Environment
- City Environment Management Officer
- CLGOO - DILG, San Carlos City
- ABC President
- San Carlos City Junkers’ Association, President

5.3.3 CSWMB Activities

ACTIVITY	SCHEDULE	REMARKS
Quarterly Meeting	January, April, July, October	Convened the first quarterly meeting on January 23, 2015
Review and update the SWM plan every 2 years	2015, 2017, 2019	Updated the SWM plan on February, 2015

Table 5.3.3: CSWMB Activities

5.4 Barangay Solid Waste Management Committees

BARANGAY	DATE REORGANIZED	BRGY. RESOLUTION NUMBER	SCHEDULE OF MEETING
I	February 6, 2014	2014 - 07	6 th day of the month
II	December 1, 2013	2013 - 023	1 st Wednesday of the month
III	May 9, 2011	2011 - 08	7 th day of the month
IV	January 13, 2014	2014 - 007	3 rd day of the month
V	March 3, 2014	2014 – 010	1 st Wednesday of the month
VI	December 1, 2013	2013 - 028	6 th day of the month
Rizal	March 1, 2014	2014 - 05	2 nd Sunday of the month



Guadalupe	May 28, 2011	2011 - 017	2 nd Sunday of the month
Buluangan	January 12, 2014	2014 - 005	2 nd Sunday of the month
Codcod	April 2, 2014	2014 - 016	1 st Tuesday of the month
Quezon	January 13, 2014	2014 - 04	2 nd Monday of the month
Prosperidad	March 17, 2014	2014 - 004	3 rd Monday of the month
Nataban	November 22, 2008	2008 - 044	2 nd Tuesday of the month
Palampas			
Punao			
Bagonbon			
San Juan			
Ermita	May 31, 2011	2011 - 014	2 nd Monday of the month

Table 5.4: BSWMC Activities

5.5 Stakeholders Participation

Organization/Association/ Institutions	Activities	Date of Implementation
1. Barangay	Brgy. Re-orientation on RA 9003	On the month of January every year
	Monthly update of the implementation of the Barangay ESWM Plan	Scheduled sessions of the respective barangay
	Conduct of the Search for the Most Environment Friendly Barangay	Every year and the announcement of winners will be done during the Environment Week
2. Private and Public Schools (Elementary/High School)	Conduct of the Search for Sustainable and Eco-friendly School	Every School Year (Started School Year 2006-2007)
3. Barangay, Local and National Agencies	International Coastal Clean-up	Every 3 rd Saturday of September
4. Pedicab, Motorcab, bancas and other Public Utility vehicle operators	Conduct monitoring and evaluation as to the compliance of the city ordinance 12-08.	Once a month
5. Business Establishments	Conduct monitoring and evaluation as to the compliance of the city ordinance 12-08 and 14-53.	Once a month

Table 5.5 Activities Conducted to Involve Stakeholders in Development and Implementation of Plan

6. Plan Strategy

Referring to the overall vision, goals and objectives of the previous plan, it has been highlighted significant outcomes that has been achieved to include but not limited to the updating of the Ten



(10) Year SWM plan, enhanced and capacitated the solid waste management board in the implementation and monitoring of the plan, continued education of stakeholders on the values and practices of ecological solid waste management, sourced out and linked various government and private organizations in the application of waste management practices and technology for San Carlos City and tapped local and international funding support for the development and implementation of ESWM in San Carlos City, establishment of the city’s final processing and disposal facility (central MRF & Sanitary Landfill) & establishment of a systematic collection route and schedule

6.1 Vision

To reiterate the SWM Vision re: A San Carlos City wherein all stakeholders are actively participating to achieve an ecologically sustainable and economically viable zero-waste management, through an enforceable ESWM ordinance.

One of the desired outcomes identified to be delineated in the plan which specifically aligned in the city’s SWM vision is the **Attainment of 74 %Waste Diversion Rate by 2024**

Notwithstanding the specific outcomes that had been already achieved in the previous plan, there were identified areas that needs for improvement. The specific targets and strategies that would be employed will also be based on the results and findings of the updated WACS. The delineation of specific outcome will be anchored on the three (3) major compliance of the solid waste management law namely; effective monitoring and evaluation of segregation at source, increase collection efficiency, and strengthen the law enforcement mechanism.

6.2 Targets

The table shows the city’s 10-year waste diversion target which aims at least one (1) percent per year. Based on 2014 data, the city diverts 64.42% of the total waste generated. Therefore it is projected that waste diversion in 2015 is 65% and will reach 74% by 2024.

Waste Diversion Targets										
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	136,279	137,574	138,881	140,200	141,532	142,877	144,234	145,604	146,987	148,384
Waste Generation	26,408	26,849	27,281	27,731	28,184	28,645	29,118	29,596	30,082	30,576



(cu.m.) (Based on Collected Waste)										
Diversion	17,165	17,720	18,278	18,857	19,447	20,052	20,674	21,309	21,960	22,626
Percentage	65%	66%	67%	68%	69%	70%	71%	72%	73%	74%

Table 6.2: Diversion targets for each year, 10-year planning period

6.3 Strategies

6.3.1 Waste Reduction at Source

- To Sustain IEC household campaign on segregation at source through 3 R's
- To Intensify the “No Plastic Campaign” through existing ordinance
- To Activate barangay solid waste management committees for the involvement of the segregation campaign

6.3.2 Segregated Collection

- To beef up Eco-Fleet for segregated garbage collection
- To formulate data base for effective collection route and schedule
- To formulate data base for the SWM plan implementation and monitoring

MRF and Sanitary Landfill Operation at Eco-Center

- Sustain organic wastes recycling/composting
- Intensify non-bio wastes processing

Strengthen existing partnership with HOLCIM in the co-processing of residual plastics and other alternative fuel & raw materials (AFR)

7. SWM SYSTEM



7.1 Source Reduction

Waste reduction at source should be promoted to major waste sources such as public market, business areas, institutions, and households. Matrix on programs and activities to promote waste reduction is shown in the table below:

Target Stakeholders	Programs/Activities	Time Frame	Output
1. Barangays	Launching of the Search for the Most Environment Friendly Barangay - Year II	January - February	All 18 barangays participated
	Orientation on Proper Documentation (18 brgys)	March	
	Enforcement Training 1. C.O. 14-53 2. C.O. 14-36 3. C.O. 12-08	February - March	
	* billboards and signages * multimedia (Plaza, Brigada, Dateline)	February - March	
	Oplan Basurahan (Puvs, Pumpboats, Establishments)	February - March	
2. Market	Conduct No Plastic Program * Conduct Search for Most Environment Friendly Market Vendor	January - December	Reduction of plastic bags
	Conduct Massive IEC 1. C.O. 14-53 2. C.O. 14-36 3. C.O. 12-08 * recorida * billboards and signages, multimedia * stall-to-store campaign * production and distribution of flyers		
3. Schools	Launching of the Search for Sustainable and Eco-Friendly School Year III SY:	February	



	2015-2016		
	Awarding of the Search for Sustainable and Eco-Friendly School Year II	February	
	Elimination Round Evaluation for Sustainable School Year III	August - September	
	Final Evaluation	December	
	Enhancement Seminar on SCC Environmental Ordinances (all Public/Private, Elementary/Highschool teachers)	June	
	Re-echo: Project Learning Tree and Water Education for Teachers	November	
	Matrix – Schools Participation w/ letter (compliance)	January - March	
4. Institution	Continued Partnership with Holcim Cement	Continuing	2% reduction of total waste generation through the recovery of plastic bags, sachets and other accepted wastes by the plant for co-processing

Table 7.1: Matrix on programs and activities to promote waste reduction

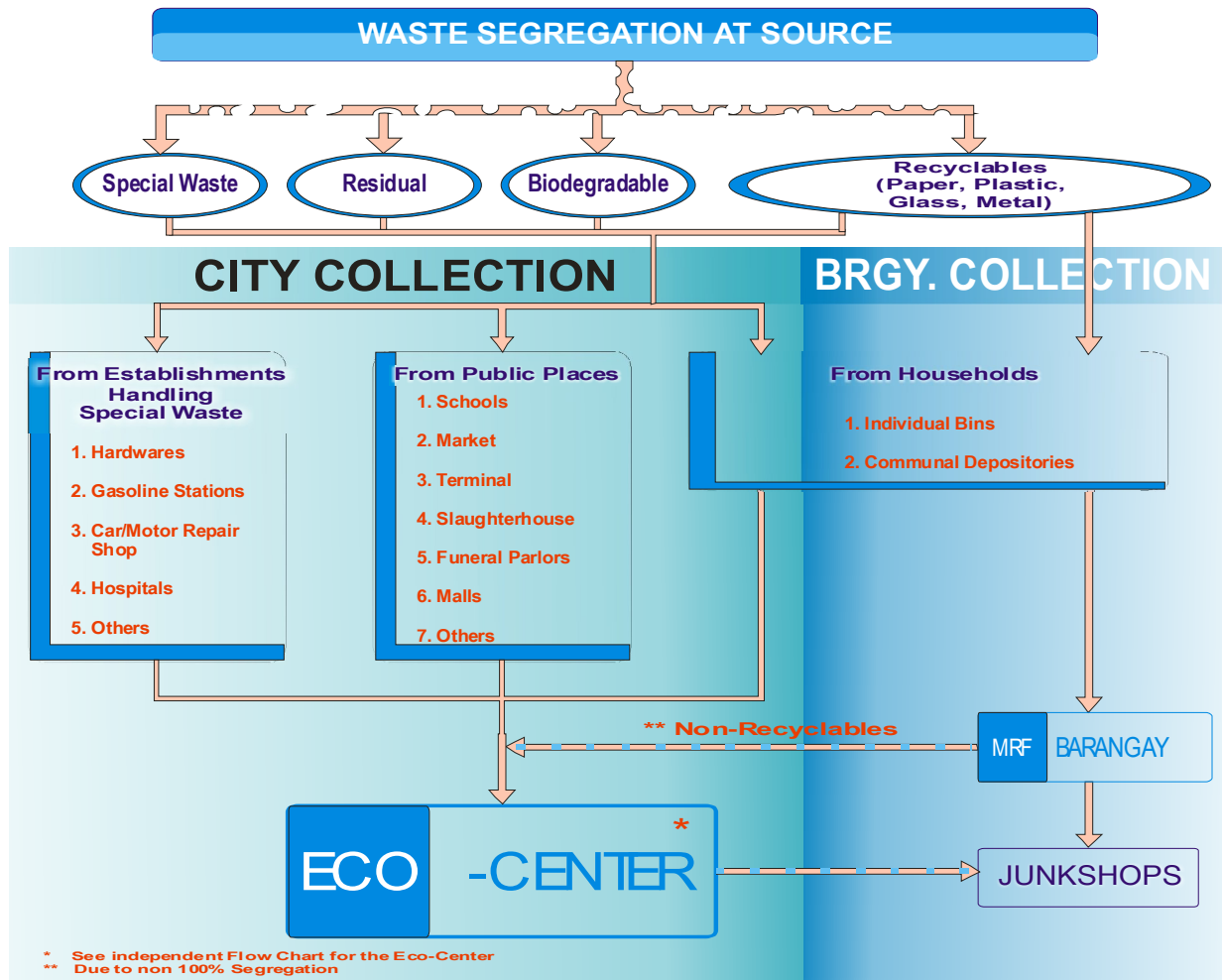
7.2 Collection

The Collection of segregated recyclable and compostable materials is the responsibility of the barangay while the Collection of mixed solid waste and residuals is the responsibility of the city/municipality.



LOCAL GOVERNMENT UNIT OF SAN CARLOS CITY
NEGROS OCCIDENTAL

SOLID WASTE MANAGEMENT PLAN (SCHEMATIC DIAGRAM)



Flow Chart 7.2: See Framework to delineate Barangay and City Collection

7.2.1 Overview

The City has initiated strategies in order to come up with a systematize collection system to include but not limited to the conduct of baseline waste collection data on current collection schedules, routes and fuel consumption, work-out a cost effective route and schedule for the city’s garbage collection including coastal and upland barangays, follow-up & monitor



compliance of collection route and schedule and regular briefing of collection crew for systematic implementation of No segregation, No collection Policy.

7.2.2 Collection equipment and routes

Collection Vehicles	Frequency	Collection Routes Morning Shift	Collection Routes Afternoon Shift
1. Garbage Compactor No. 968	Daily	Route 1 (see 3.4.1)	Route 6 (see 3.4.1)
2. Garbage Compactor No. 524	Daily	Route 2 (see 3.4.1)	Route 5 (see 3.4.1)
3. Garbage Compactor No. 472	Daily	Route 3 (see 3.4.1)	Route 4 (see 3.4.1)
4. Garbage Truck No. 201	Daily	Special Collection within the City Proper	Special Collection within the City Proper

Table 7.2.2: List of Collection Equipment and Routes

The existing mode of collection will be followed in the next years taking into account the effectiveness of the routes established, the efficacy of the garbage trucks as well as to the drivers and collectors.

7.2.3 Private Collection Service

As of the moment, the local government is not hiring private contractor for the city’s garbage collection since, the current waste collection activity is being done by administration through the City Environment Management Office.

7.2.4 Storage and Set out (According to the City Ordinance No. 12-08 Section 4e.06)

7.2.4.1 For Residential Areas

- The concerned resident shall ensure that the solid wastes are brought out in front of his gate or door and along the collection route of the collection vehicle, during the collection period;
- The concerned resident shall report to the City Environment Management Office or concerned official for any uncollected solid waste within the vicinity of the residence;
- Garbage, not segregated and placed in approved containers, shall not be collected;
- The specific date and hour of garbage collection in particular locations shall be scheduled and announced.



7.2.4.2 For Commercial Areas

- The owner, operator or lessee of any enterprise shall be responsible for the timely positioning of stored solid wastes during the collection period, which shall be made known in advance by the proper authorities, which shall likewise assist, wherever necessary means of loading wastes for collection purposes; and
- The person concerned shall remind the Solid Waste Management Unit of San Carlos the collection of uncollected solid wastes and other related matters.

7.2.4.3 For Industrial or Industrial Areas

- The head of any institutional or industrial establishment shall assist the City Government in the orderly and sanitary way of collecting and transporting solid wastes;
- The collection and transportation of any hazardous wastes, if necessary, shall be duly coordinated with the government agencies concerned, with such type or types of wastes.

7.2.5 Segregated Recyclables

- Segregated recyclable wastes should be duly segregated and shall be placed in an enclosed bag prior to their storage in the assigned receptacles within the premises of the households, establishments and other institutions for either direct sale to junkshops and or barangay collection for depository in their respective barangay MRF.

7.2.6 Segregated Compostables

All biodegradable materials will be collected by the city and will be composted either by windrow, vermi-composting or other practical and appropriate composting technologies available. However, the respective barangays should encourage to the processing of their green generated wastes. The necessary carbon material for enhancing digestion such as; sawdust, or sugar cane tops will be introduced in the biodegradable waste pile windrows.

7.2.7 Mixed solid waste/residuals

The residual wastes that are accepted by the Holcim Cement Plant for co-processing shall be properly contained and baled for shipment while the remaining discarded residual wastes shall be brought to the Sanitary Landfill Site for proper disposal. Special, toxic and hazardous wastes shall be properly sealed, preferably in plastic containers and shall be stored at the Eco-Center storage area.



7.3 Segregation, Recycling, and Composting

7.3.1 Segregation

The imposition of the city’s no “**No Segregation, No Collection**” policy enhance the implementation of segregated collection.

The City likewise devised a strategy relative to the monitoring of segregation at the barangay level. (Enclosed matrix for the current monitoring tool re: segregation at source)

Household Logbook

Name of Household Head _____

Purok _____ Monitored by: _____

Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
example												

Table 7.3.1: Sample CMFM BF Form # 1

Purok SWM Report Record

Purok : _____ Barangay: _____

Period covered: _____ Total Hhs: _____

Indicators	Jan		Feb		Mar		Apr	
	✓		✓		✓		✓	
	x		x		x		x	
	✓		✓		✓		✓	
	x		x		x		x	
	✓		✓		✓		✓	
	x		x		x		x	
	✓		✓		✓		✓	
	x		x		x		x	

Table 7.3.1: Sample CMFM BF Form # 2



Barangay CMFM Record

Project Title : Citizens Monitoring & Feedback Mechanism
Location : Barangay _____ Total Number of Households: _____
Period/Month : _____

Households:

Indicators	Purok-			Purok-			Purok-			Purok-		
	Total Hhs -			Total Hhs -			Total Hhs -			Total Hhs -		

Table 7.3.1: Sample CMFM BF Form # 3

7.3.2 Recycling

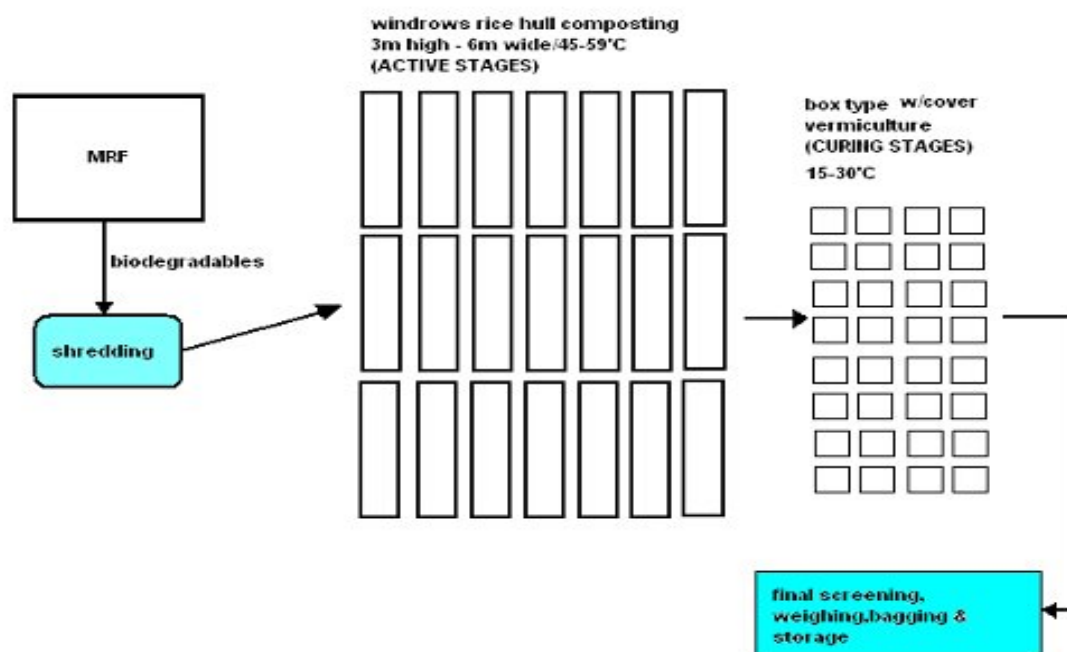
One of the major components of waste management is recycling. The identified recyclable materials at the household level will be brought mainly to the Barangay MRF (Barangay collection) to be picked up by the junkshops. The recyclables collected by the city will be brought to the Central MRF in the Eco-Center. The remaining recyclables (e.g. plastics, sando bags, etc.) will be deposited to the Eco-Center’s Central MRF for future processing and recycling. As part of the recycling strategy the city recommend amendments to building ordinances, requiring newly constructed buildings to provide storage space, devices or systems that will facilitate source separation and storage of designated recyclable materials.

7.3.3 Composting

All biodegradable materials that will be collected by the city will be composted either by windrow or vermi-composting. The necessary carbon material for enhancing digestion such as; sawdust, etc.will be introduced in the biodegradable waste pile windrows.

The huge biodegradable heaps will be processed at the composting facility of the Eco-Center. The compost product will be introduced to the city’s vast agricultural area as a enhancer or soil conditioner.

(Enclosed composting facility flow chart)



Flow Chart 7.3.3: Biodegradable Waste Process Flow

7.3.4 Marketing

The City Government of San Carlos conducted regular Waste Market Fair in partnership with SM Chain during fiesta celebration to promote and market recyclable materials, where local recyclers and junkshop operators from different cities in the province were invited to buy recyclable materials and electronic wastes.

On the other hand the city also passed an ordinance allowing the sale of recyclables and compost under the supervision of the CEMO. A scheme is in place where recyclable items sorted and accumulated in the Eco Center’s MRF will be subject for auction. The winning bidder will get the recyclable items after payment is being done at the City Treasurer’s Office.

At present, the Province of Negros Occidental is advocating the “Organic Negros” slogan promoting organic farming. These directly and indirectly promotes compost products from green wastes. As experienced, upland farmers, sugarcane planters and other walk-in clients availed the compost produced at the eco center, thus promoting the utilization of organic fertilizer and or soil conditioner out from the processed green wastes and other biodegradable waste materials. The city has already incurred significant sales of compost at Php 2.00/kilo (compost product derived from windrow composting) and Php 5/kilo for the vermi-cast (compost process from the African night crawler worm specie)



7.4 Transfer

There is no necessity to have a transfer station since the city's garbage collection team and logistics is adequate to cope up with the demand. However, as mentioned in the previous chapter, the Provincial Government of Negros Occidental is looking into the possibility of making Eco-Center as the drop off points of residual plastics coming from the different LGU's under the existing partnership with HOLCIM in the co-processing of residual plastics

7.5 Alternative Technologies for Residual Wastes

Due to the existing partnership between the City and Holcim Cement. Plastic bags, laminates and other waste materials accepted by the waste-to-energy plant shall be separated and properly baled for shipment to Holcim Cement factory for co-processing.

7.6 Disposal

The recent comprehensive annual report made by the Integrated Waste Management & Pollution Control Division of CEMO reveals that the 1st cell sanitary landfill will be totally filled up by year 2019 given the city's projected waste diversion rate. (See graph below)

The Eco-Center area of five (5) hectares has been acquired only through a renewable lease contract of ten years starting year 2006 which will expire on year 2016. Thus, the City Government is currently negotiating the landowner to acquire the property for the continuity of waste processing operation and disposal of the daily collected garbage. The target of the city is to acquire the property by 2016.

Simultaneously, the city also passed an ordinance which considers the clustering provision of R.A. 9003 to broaden compliance under Section 44. Establishment of Common Waste Treatment and Disposal Facilities - Pursuant to Sec. 33 of R.A.7160, otherwise known as the Local Government Code, all provinces, cities, municipalities and barangays, through appropriate ordinances, are hereby mandated to consolidate, or coordinate their efforts, services, and resources for purposes of jointly addressing common solid waste management problems and/or establishing common waste disposal facilities for clustering therefore allowing interested LGU's within the 1st District of Negros Occidental to dispose residual wastes provided that interested parties should pay an equivalent tipping fee.

In addition, the city initiates closure plan anticipating that the 2 hectare landfill area will be filled up. The activities includes; planting of trees surrounding the peripheral area and identifying

location of gas vents and exploring other alternative technologies e.g. waste plastic to fuel, waste to energy among others for future utilization after 2030 and beyond.

7.6.1 SW Disposal Capacity

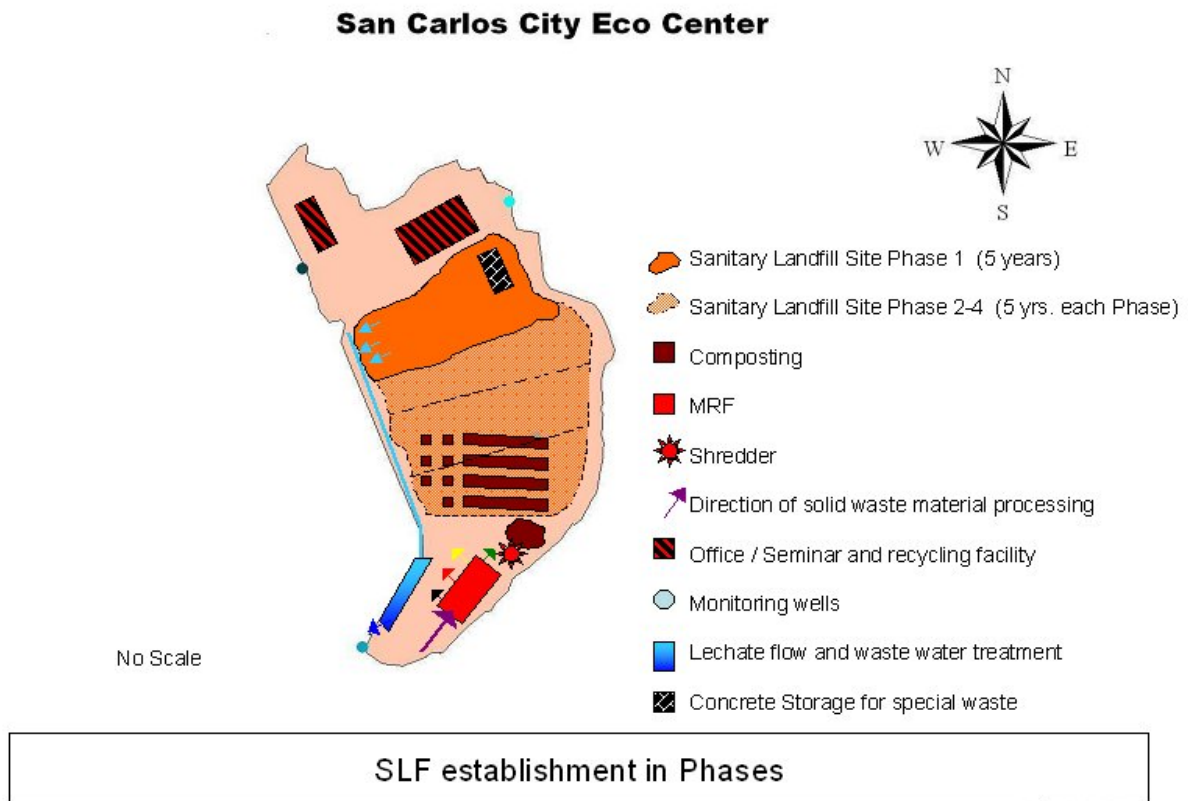


Figure 7.6.1: Existing SW Disposal Facility

The lining system, established at the SLF side, is a combination liner according to the RA 9003 and shown in the picture below. The permeability of the local clay is being tested by ITDI-Department of Science & Technology (DOST), Manila prior to construction.

7.6.1.1 Projected Landfill Lifespan

For the purpose of long-term disposal capacity planning, a somewhat conservative citywide diversion rate of 65 per cent and a 1% increase will be assumed per year. Using projections of population and waste disposal, it is estimated that the landfill capacity of 105,608 cu.m. would

last up to eleven (11) years. A summary of waste generation, disposal quantities and landfill capacity is provided below.

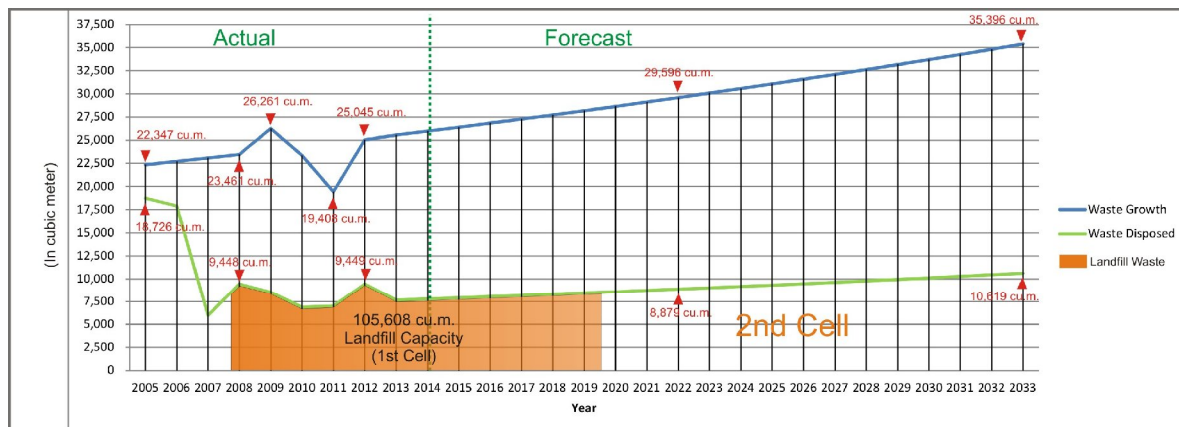


Figure 7.6.1.1: Projected Landfill Capacity

7.6.2 Existing Facilities

The Former controlled dumpsite at Villarante Village, Brgy. I, was officially closed on February 9, 2009 with an approved authority to close (ATC) Code: (SCR-EMB R6 No. 20-0917) for the safe closure & rehabilitation plan after the new Eco Center and Sanitary Landfill in Brgy. Guadalupe was opened on September 17 2007.

7.6.3 New Facilities

The City of San Carlos was able to establish an “Eco-Center” which is an integrated solid waste management system where vital facilities were installed for the mass recycling/composting of biodegradable materials and the landfilling of non-bio residual wastes to enable the city to comply with the mandatory waste diversion and installation of final disposal facility (sanitary landfill).

The approach or technology used in project implementation is entirely a pioneering application since the system is an integration of a waste processing area for biodegradable and non-biodegradable waste, a sanitary landfill utilizing indigenous local materials such as; clay for the lining system and gravel drain instead of HDPE liner and leachate collection and biological treatment.

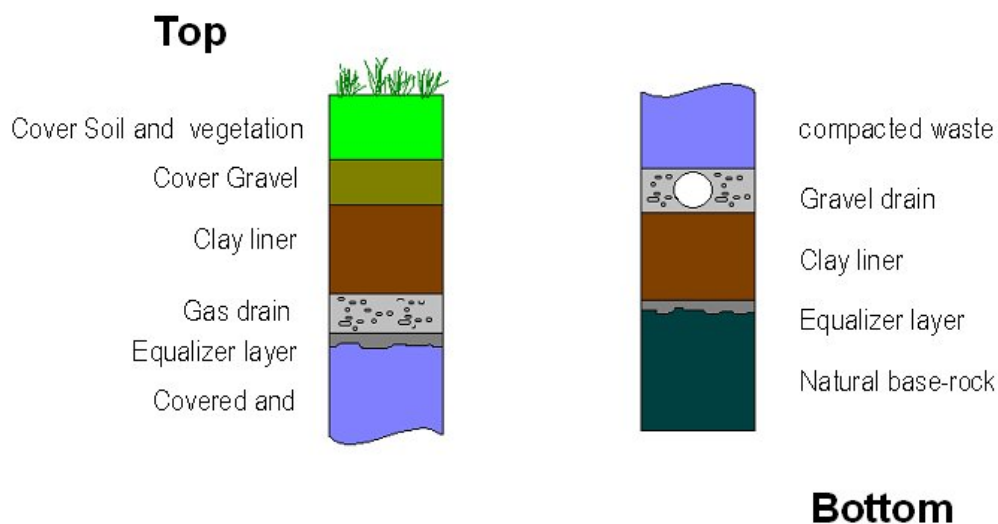
7.6.4 Sanitary Landfill (SLF) Design

Additional to those natural barriers come the technique of landfilling as so-called technical barrier. The SLF was established and constructed by phases over the whole 30 years; hence the 1st cell disposal area is only about 6,600 sq.m. Depending on the results of pretreatment this size will be good for 11 years. This shows that MRF and the Landfill are acting like a whole system.

Managing only small disposal areas minimizes the generation of emissions such as leachate. The picture below shows the phasing of sanitary landfill (SLF) establishment in the San Carlos City's Eco Center. After closing phase 1 and 2 of the SLF, the composting will be transferred on the top of these phases so that phases 3 and 4 will be established.

SLF Cross Section

Landfill site construction



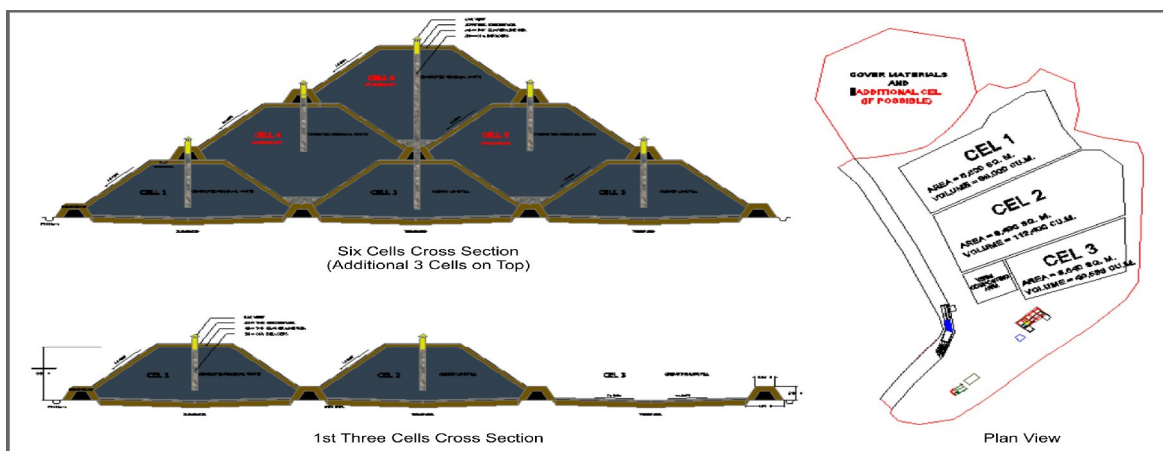


Figure 7.6.4: Sanitary Landfill Plan and Cross Section

7.7 Special Wastes

The city is responsible in bringing toxic, hazardous and hospital wastes into the Eco Center and disposed of in a designated area in the sanitary landfill. However, prior to sanitary landfill disposal, the pre-treated hospital wastes (e.g. syringe, needles and others) will be stored in a high density plastic container after which such container is sealed with concrete.

Likewise, other recyclables extracted in some of the selected hazardous waste (e.g. used motor batteries, etc.) will be brought to its appropriate recyclers for further treatment and proper disposal

7.8 Information, Education and Communication (IEC)

The Local Government Unit of San Carlos City in partnership with the Global Environment and Nature Ecosystems Society (GENESYS) Foundation implemented the Information, Education and Communication (IEC) prioritizing the lowland urban barangays of San Carlos City which commenced on October 17, 2002 through a memorandum of agreement. The 2nd year of the IEC program implementation covered the rural barangays.

7.8.1 Introduction

The target participants in the conduct of IEC were the Sangguniang Barangays, households, business establishments, institutions, religious institutions and other areas identified during the



course of implementation. The conduct of IEC is implemented in accordance with the Implementing Rules & Regulations (IRR) set in the R.A. 9003 and its methodology is likewise designed to advocate and reach as to many citizens as possible and be oriented in the mechanics of ESWM.

Stressed in the campaign was the need for a serious and sincere “lifestyle change” that will ease the overhaul of the personal and societal practices that contribute to the generation and mismanagement of waste in the households, businesses and institutional establishments

7.8.2 Core Messages

The project training modules were patterned after those developed by the Solid Waste Association of the Philippines (SWAPP), adapted to the San Carlos environs and viewed through PowerPoint Software.

Two (2) training modules were prepared: The “Orientation Seminar on Ecological Solid Waste Management” and the “Barangay Planning Workshop Seminar”. These modules were used to train the project staff, barangay councils, solid waste management board and the other participants for the information, education and communication campaign (IEC)

Cross visits, song composition with themes on ecological solid waste management and its practices, documentation on best practices within the local barangays, ESWM exhibits and training impact sharing and other structured learning exercises were incorporated into the module to further enhance the trainings.

7.8.3 Approach

Fliers were developed which discusses ecological solid waste management and its principles. Composting principles, specially in application to home and kitchen waste, were discussed in the other flier. These materials were distributed to the Sangguniang Barangay and all other groups that underwent the ESWM trainings.

Posters with similar advocacy relative to ESWM information were posted around strategic areas in the city like the market, LGU offices, schools, churches. Banners with five (5) different information on ESWM were constructed out from plastic sack cloth and were likewise distributed to participating barangays for posting in strategic areas.



7.8.3.1 Planned IEC Activities

ACTIVITY	TARGET AUDIENCE	MESSAGE	METHOD	TIME FRAME
Reorientation on RA 9003	Barangay Council of the 18 barangays	Increase awareness relative to the role of the barangay	Symposium	Every month of January of the year
	School Administrators and the teacher in-charge in ESWM	Increase awareness relative to the effective implementation of the ESWM program of the school	Symposium	Every month of May of the year
	CEMO Staff (divided into 12 groups)	Increase awareness relative to the salient features of the law	Symposium	Every month
Evaluation of the San Carlos City Search for the Most Environment Friendly Barangays	18 Barangays	Ensure the sustainability and efficacy of the SWM programs of the 18 barangays	Interview and couching by the evaluators	Every month of May of the year
Evaluation of the San Carlos City Search for Sustainable and Eco-Friendly Schools	Participating Schools	Ensure the sustainability and efficacy of the SWM programs of the San Carlos City schools	Interview and couching by the evaluators	Every July and December of the year
Massive Barangay Clean-up relative to the Earth Day Celebration	18 Barangays	To find possible solutions to the problematic areas within their respective barangays	Actual Clean-up	Every 22 nd of April



Localized Environment Week Celebration	18 Barangays, Schools, institutions	To raise awareness relative to the environmental programs of the city	Symposia, Exhibit, Film Showing	Every third week of June
Massive advocacy on the Plastic Ordinance of the city	18 barangays	Plastic bags waste minimization	Recorda, Store to Store Campaign, Video Presentation	All throughout the year

Table 7.8.3: Planned IEC Activities

Barangay Training on Ecological Solid Waste Management (ESWM)

The Barangays were given training/seminar workshop with 30 participants per barangay. These were composed of the whole Sangguniang Barangay, Secretary, Treasurer, Day Care Teacher, Barangay Health Worker and selected tanods, purok leaders and point or model households of the barangay. The training will enable them to formulate their vision/mission statements, which will be incorporated in the barangay plan.

Each barangay is provided with a “Barangay Training Manual on Ecological Solid Waste Management” that contains pertinent information and references useful for planning and implementing ESWM.

Various cross visits to different “puroks” and “sitios” in nearby municipalities were also facilitated to observed exemplary waste management practices and enabled the participants to gain insights for them to apply in their respective barangays.

7.7 Market Development

The Solid Waste Management Office (SWMO) in coordination with the City Livelihood and Development Office (CLDO) work hand in hand in the marketing of all the recycled products coming from the Eco-Center’s recycling initiative and likewise from the city barangays varied recycled items.

This strategy enable the city to have a centralized marketing arm to handle the promotion and marketing of existing and potential recycled products for local and international buyers.



8. Implementation Strategy

The City formulate a logistical framework (LOGFRAME) for the implementation of the solid waste management system.

8.1 Framework - SWM Program Log frame

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATOR (OVI)	MODE OF VERIFICATION (MOV)	INITIAL ASSUMPTION (IA)
<p>GOAL:</p> <p>An enhanced ecologically balanced and sustainable San Carlos City Solid Waste Management Program under the Integrated Waste Management / Pollution Control Division of CEMO</p>	<p>25 % Waste Diversion Target Within 5 - Year Period</p> <p>CY 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024</p> <p>65%, 66%, 67%, 68%, 69%, 70%, 71%, 72%, 73%, 74%</p> <p>Actual Diversion for CY 2014 - 64%</p>	<p>Accomplishment Report of IWM/PCD based on the SWM Plan</p>	<p>Effective implementation of San Carlos City's SWM Program.</p> <p>Fully functional Integrated Waste Management / Pollution Control Division</p>
<p>OBJECTIVE:</p> <p>1. Enhance Eco-Center Operation</p> <p>2. To set up an effective Solid Waste Collection System</p>	<p>Eco-Center Project established & Operational since 2007</p> <p>Increased Segregated Waste Collection Rate</p>	<p>100% Project Accomplishment Report from IWM/PCD Records of the IWM/PCD annual report</p>	
<p>3. To institutionalize IEC, monitoring and enforcement mechanism for the city's SWM Program</p>	<p>Detailed IEC, monitoring and enforcement strategy reflected in both SWMPlan and SWM Ordinance</p>	<p>Record from IWM/PCD: - Approved SWMPlan by NSWMC -Approved ESWM Ordinance by S.P.</p>	



<p>OUTPUT:</p> <p>1. Increase Landfill Lifespan</p>			
<p>ACTIVITIES</p>			<p>PRE-CONDITIONED</p>
<ul style="list-style-type: none"> • Enhance Bio and Non-bio segregation • Improve landfill compaction • Continued recovery of plastic bags 		<p>Records from Eco-center field office.</p>	<p>MOA between San Carlos City LGU and Holcim Cement</p>
<p>OUTPUT:</p> <p>2. Systematic Collection System</p>	<p>100% collection of garbage</p>		<p>Initial Assumption:</p> <p>Systematic collection plan established</p>
<p>ACTIVITIES</p>	<p>INDICATORS</p>	<p>MOV</p>	<p>PRE-CONDITIONED</p>
<ul style="list-style-type: none"> • Baseline collection data on current collection schedules, routes and fuel consumption • Work-out a cost effective route and schedule for the city's garbage collection including coastal and upland barangays • Follow-up & 	<p>Reduction in garbage truck operating hours</p> <p>100% of households served</p>		<p>Collection route and schedule is available</p>



<p>monitor compliance of collection route and schedule</p> <ul style="list-style-type: none"> Briefing of collection crew for systematic implementation of No segregation, No collection Policy 			
<p>ACTIVITIES</p>			<p>PRE-CONDITIONED</p>
<p>OUTPUT:</p> <p>3A. Institutionalize ESWM capability building and education through the City LGU (SWMO, DepEd)</p>			<p>Initial Assumption:</p> <p>IEC, monitoring and enforcement mechanism already formulated</p>
<ul style="list-style-type: none"> Implementation of environmental education in schools' curricula Environmental advocacy 			<p>PRE-CONDITIONED</p> <p>Regular budget allocation for IEC, monitoring and enforcement support is appropriated on a yearly basis chargeable to the 20% Development Fund of the city's IRA.</p>



<p>3B. Monitoring and Evaluation</p>			
<ul style="list-style-type: none"> • Facilitate coordinative and logistical follow through support re: ESWM IEC initiative for the 18 barangays of San Carlos City • Preparation course of all MRF Operators “Ecological Operation of MRF” (segregation skills, waste stream monitoring, basic book keeping and marketing, etc.) 			
<p>3C. Enforcement and Compliance</p>			
<ul style="list-style-type: none"> • Preparation in the conduct of meetings/ seminar with BRGY Waste Officers for monitoring and enforcement of the city’s SWMPlan (e.g. module, content, etc.) • Identification of all different enforcement groups and introduction seminars and WS about the laws etc. • Conduct paralegal training/seminars for enforcement of the city’s SWM Ordinance 			



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Table 8.1: SWM Implementation Activities

8.2 Diversion Projections

Waste Diversion Targets										
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total Waste Generation	26,408	26,849	27,281	27,731	28,184	28,645	29,118	29,596	30,082	30,576
Recyclables	1,373	1,418	1,463	1,509	1,555	1,604	1,653	1,704	1,756	1,810
Compostable Wastes	15,791	16,302	16,815	17,348	17,892	18,448	19,021	19,605	20,204	20,816
Diversion	17,165	17,720	18,278	18,857	19,447	20,052	20,674	21,309	21,960	22,626
Percentage	65%	66%	67%	68%	69%	70%	71%	72%	73%	74%

Table 8.2: Waste Diversion Projection for Each Year, 10-Year Planning Period

8.3 Monitoring Program

The City has adopted a Citizens Monitoring & Feedback Mechanism (CBMFM) tool to be able to monitor barangay compliance with respect to enforcing the implementation of R.A. 9003 at the barangay level. Enclosed various tools for compliance monitoring

HOUSEHOLD LOGBOOK

Name of Household Head _____

Purok _____ Monitored by: _____

Indicators	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec

Table 8.3: Sample CMFM BF Form # 1



Purok SWM Report Record

Purok _____ Barangay _____
Period covered _____ Total Hhs _____

Indicators	Jan		Feb		Mar		Apr	
		✓		✓		✓		✓
	X		X		X		X	
	✓		✓		✓		✓	
	X		X		X		X	
	✓		✓		✓		✓	
	X		X		X		X	
	✓		✓		✓		✓	
	X		X		X		X	

Table 8.3: Sample CMFM BF Form # 2

Barangay CMFM Record

Project Title : Citizens Monitoring & Feedback Mechanism
Location : Barangay _____ Total Number of Households ____
Period/Month : _____

Households:

Indicators	Purok-			Purok-			Purok-			Purok-		
	Total Hhs -			Total Hhs -			Total Hhs -			Total Hhs -		

Table 8.3: Sample CMFM BF Form # 3

8.3.1 Alternatives Analysis

The city has no other option of waste diversion except for the utilization of central material recovery facility, barangay MRF's for the processing of bio and non-bio wastes in order to increase waste diversion and processing selected residuals for Holcim Cement for co-processing.



8.4 Incentive Programs

The Search for San Carlos City Model School and Barangay on ESWM awareness in schools is on its 8th year since CY 2006 which is a huge contributory on the success of the SWM implementation.

The success of implementation of the campaign is due to the strong collaborative multi-sectoral partnership of non-government organizations (NGO's), the Academe, Provincial and National Government Agencies, international partners and the civil society. In line with the conduct of such search, the City Government is allocating annually for the prizes for the winners to encourage more participation from the constituents.

SOLID WASTE MANAGEMENT OFFICE
MATRIX OF ESWM SCHOOL CONTEST
FROM YEAR 1 TO YEAR 4 (SY 2006-2007, SY 2007-2008, SY 2008-2009, SY 2009-2010)

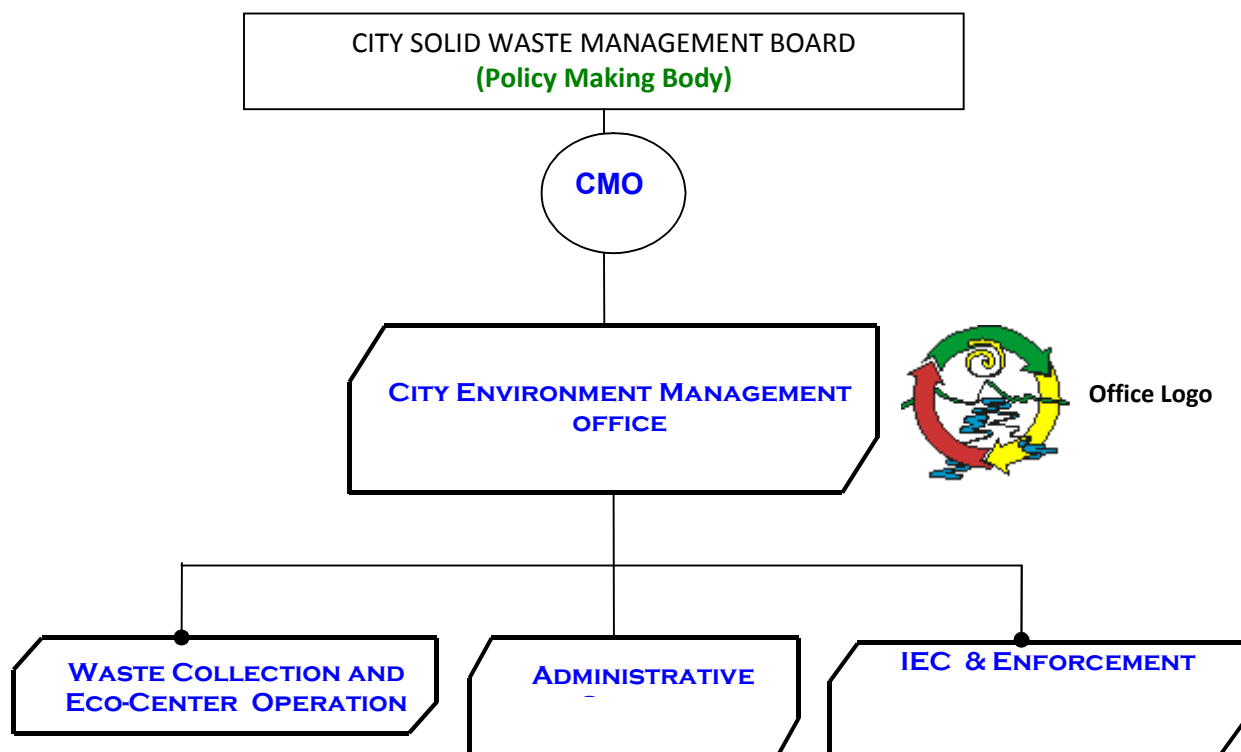
NAME OF SCHOOL	SCHOOLS RECYCLABLES DRIVE CONTEST		SAN CARLOS CITY MODEL SCHOOL IN ESWM		
	YEAR 1 (SY'06-'07)	YEAR 2 (SY'07-'08)	YEAR 3 (SY'08-'09)	YEAR 4 (SY'09-'10)	YEAR 5 (SY'10-'11)
District I					
Greenville Elementary School		X	X		
Nabataan Elementary School				X	X
Rizal Elementary School					X
San Juan Elementary School					X
Kalician Elementary School					X
Ermita Elementary School					X
District II					
Cong. Vicente Gustilo Sr. Memorial School	X	X	X	X	X
Guadalupe Elementary School		X	X	X	X
Cabuqan Elementary School		X	X	X	X
Gigalaman Elementary School			X	X	X
Pano-olan Elementary School		X	X	X	X
Prosperidad Elementary School			X	X	X
Punod Elementary School			X	X	X
San Jose Elementary School		X	X	X	X
Tal-ot Elementary School			X	X	X
Handalago Elementary School			X		
Tuburan Elementary School		X	X	X	X
District III					
Florentina Ledesma Elementary School		X	X	X	X
San Carlos Milling Company Inc. Elementary School	X	X	X	X	X
Burlad Elementary School		X	X	X	X
Pinamantawan Elementary School		X	X	X	X
Bedio Elementary School		X	X	X	X
Codcod Elementary School		X	X	X	X
Cabantasan Elementary School		X	X	X	X
Illiran Elementary School		X	X	X	X
District IV					
Habuayo Elementary School		X	X	X	X
Natuyay Elementary School		X	X	X	X
Lagha Elementary School (main)		X	X	X	X
Lagha Elementary School (extension)		X	X	X	X
Quezon Elementary School		X	X	X	X
Maglunod Elementary School		X	X	X	X
Napudian Elementary School		X	X	X	X
Igamamatay Elementary School		X	X	X	X
Balabag Elementary School		X	X	X	X
District V					
Andres Bonifacio Central School	X	X	X	X	X
Hunob Elementary School		X	X	X	X
Lamesa Elementary School		X	X	X	X
Trozg Elementary School		X	X	X	X
Katingal-an Elementary School		X	X	X	X
Bairan Elementary School		X	X	X	X
Mabato Elementary School		X	X	X	X
District VI					
Tandang Sora Elementary School	X	X	X		
Lina dela Vina Valmayor Elementary School		X	X	X	
Talave Elementary School					X
Cabunao Elementary School		X	X	X	X
Malindog Elementary School		X	X	X	X
Panlaqan Elementary School			X	X	X
Pagbatangan Elementary School			X	X	X
Bagonbon Elementary School			X	X	X
Mag-amihan Elementary School			X	X	X
District VII					
High School					
Sipaway National High School			X	X	X
Julio Ledesma National High School	X	X	X	X	X
Don Carlos Ledesma National High School	X	X	X	X	X
Colegio de Sto. Tomas - Recoletos	X		X	X	X
Quezon National High School	X	X	X		
Bagonbon National High School	X		X		
Central Negros College	X		X		
Colegio de Sta. Rita High School	X		X		
Private Elementary					
Dalays ABC Foundation School	X				
Colegio de Sta. Rita Elementary School	X		X		
TOTAL	13	37	53	44	46

Table 8.4: Matrix for Participating Schools for CY 2014-2015



9. Institutional Aspects

The Solid Waste Management Board is the policy making body which sets the overall solid waste management program thrust geared towards the institutionalization and ensures sustainability of its operation in accordance with the City’s (10) Year Solid Waste Management Plan through the City Environment Management Office which handles the management and operation of solid waste management related program.



9.1 Roles

9.1.1 Participatory Approach

The local government recognized that success of solid waste management does not just lie on the technical methods in disposing of waste. Thus, people’s participation was utilized wherein all sectors of the community were targeted to become involved in waste diversion at their level. These include the private/industrial/agricultural sector, the schools, the eighteen barangays, and all households. Citizens are further given the responsibility to manage waste in the village level.



9.1.2 Waste Minimization and Increased Waste Diversion

Due to the focus of the Lifestyle Change Project to promote waste diversion at source, such source segregation is already evidently practiced with households, industries, schools, barangays, and different community institutions doing their own respective SWM initiatives. Regular waste characterization revealed the decreasing trend in waste contamination reaching to only 3% in non-biodegradables currently. Waste contamination in biodegradables is also down to 3%. This makes it easier for the garbage collection team and the Eco-Center to further segregate and divert waste. Currently, waste diversion at the Eco-Center reached an impressive 70% which is more than the 25% required by R.A. 9003.

9.1.3 Behavioral Change Approach

The Local Government of San Carlos went beyond the conventional solid waste management program of using an efficient collection system and infrastructure. Instead, it embarked on a comprehensive education and advocacy that sought to change people's behavior towards responsible waste management. While information, education and communication is enunciated in R.A. 9003, the Behavioral Change Approach is based on an education platform that enables the target audience to learn the positive or negative consequences of their action. It further focuses on the benefits derived from positive waste management practice thus leading to individual and group motivation.

9.2 Legal

The San Carlos City Environment Code was approved on June 25, 2012 with the objectives; (a) To promote the principles of ecologically sustainable development (b) To ensure that all reasonable and practicable measures are taken by the city government to protect, restore and enhance the quality of the environment, having regards to the principles of ecologically sustainable development (c) To prevent, reduce, minimize and where practicable, harm to the environment (d) To encourage and assist action by industry, government authorities and the community aimed at pollution, prevention, clean productions and resources and waste minimization (e) To regulate in an integrated, systematic and cost effective manner specifically on the activities, products, substances and services that, through pollution or production of waste, cause environmental harm and the generation, storage, transportation, treatment and disposal of waste.

10. Social and Environmental Aspects



Even at the beginning of the solid waste management initiative, the local government recognized that service delivery could be done by other community institutions. It manifested its commitment to collaborative and participatory form of governance by entering into partnership with a Non-Government Organization, GENESYS Foundation, to implement the initial phase of the SWM program—the information, education and communication initiative. The technical aspect of the Solid Waste Management System, particularly the Eco-Center, is provided with technical assistance by DED, the German Development Service. The Solid Waste Management Board recognized that such technical component/facilities are useless if the source of the waste, households and institutions, do not exercise responsibility in segregation. The Foundation is already a member of the Solid Waste Management Board due to its thrust in environmental protection. The Foundation then designed the IEC initiative to go beyond just the simple manner of providing knowledge but was directed towards changing people’s attitude and behavior, emphasizing early on project planning and design that waste management is people’s responsibility. It is important to note that the decision to make IEC as the primary initiative is to highlight the need to capacitate and empower people to responsibly manage waste at the source level. There was a realization that capacity-building leads people to develop a sense of ownership.

10.1 Social Aspects

The waste diversion efficiency expresses the fact that citizen responsibility is increasing with most households doing segregation efforts. This also indicates that the avowed goal of changing lifestyle that promotes individual and household responsibility in solid waste management is taking root. In this manner, the project has significantly changed people’s attitude and orientation towards waste. Policies of the government, whether those stipulated in R.A. 9003 as well as the LGU policy of “no segregation, no collection,” could not be realized without people’s new knowledge and changed behavior in segregating and diverting waste. Proof of such change is exhibited in the different manner by which community associations and institutions are initiating their own respective SWM initiatives. All eighteen barangays have been covered in the IEC campaign. Out of these, nine (9) have already set-up their own Citizens Monitoring and Feedback Mechanism (CMFM). All barangays have also established their own Materials Recovery Facility

10.2 Environmental Aspects

For the rehabilitation and final closure of existing dumpsite, the city has been Issued **Authority To Close (ATC) Code: (SCR-EMB R6 No. 20-0917)** for the safe closure & rehabilitation plan submitted to EMB-DENR 6 dated September 17, 2008 based on the guidelines and standards of safe closure set by EMB-DENR Region VI.



In line with the city’s new processing and disposal dubbed Eco-Center Project, the Local Government of San Carlos City has been issued **Environmental Compliance Certificate (ECC)** No. **0607-0130-030-120** for the submitted Initial Environmental Examination Checklist to EMB-DENR 6 for the establishment of San Carlos City’s Sanitary Landfill considering environmental requirements in the setting up of the facility which is an integrated waste management system.

11. Cost Estimates /Financial Aspects

The Solid Waste Management Program of San Carlos City is being financed through the 20% Development Fund (20% of the Internal Revenue Allotment or IRA) as source of fund. The yearly budget is being deliberated annually (which usually falls on the 3rd quarter of the year) under the auspices of the Local Finance Committee.

11.1 Investment cost

Site Development		
Access road	150,000.00	
Earthmoving for MRF	350,000.00	
Perimeter Fence	800,000.00	1,300,000.00
MRF Construction		
Building	900,000.00	
Workers area (CR, Washing, etc.)	100,000.00	1,000,000.00
Office Building	350,000.00	350,000.00
Composting		
Windrow composting Area	50,000.00	
Vermi Composting Area	100,000.00	
Screening, Wrapping, etc.	50,000.00	200,000.00
Sanitary Landfill		
Nagutman clay (20% of the liner) / Permitting, excavating, hauling of material for 2 units of SLF, etc.	1,750,000.00	
Host clay(80% of the liner)/Excavating, preparing of landfill	600,000.00	
Liner construction / Mixing of clay, compacting of clay liner, construction of drain liner	1,300,000.00	3,650,000.00
Water Treatment		
Drainage and Leachate treatment facility	1,000,000.00	1,000,000.00
		7,500,000.00



Table 11.1: Cost Estimation for San Carlos City Eco-Center

11.1.1 ANNUAL BUDGET FOR SOLID WASTE MANAGEMENT

The matrix presentation below shows the budgetary allocation for the city’s solid waste management program for the last nine (9) years in *Millions per Year*:

Sources of Funds	CY 2007	CY 2008	CY 2009	CY 2010	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015
Source 1 – 20% Dev’t. Fund (20% of IRA Allocation)	17.35	10.35	10.35	15.35	15.35	15.35	15.35	15.35	15.35
Source 2 - Provincial Development Assistance Program (PDAP) - Province of Negros Occidental		1.00							
SOURCE 3 - LUMP SUM APPROPRIATION,	1.20								
Total Program Budget	18.55	11.35	10.35	15.35	15.35	15.35	15.35	15.35	15.35

Table 11.1.1: Matrix on Budget Allocation for the last 9 Years

11.2 Annual Costs

Budgetary Items	Amount
1. Sanitation & Environmental Protection Program	₱ 5,483,200.00
2. Ecological Center Project Operation	3,516,800.00
3. Citywide Barangay and Schools ESWM Capacity Building Program	1,300,000.00



4. Sanitation and Environmental Protection Program- Maintenance of City Lanes related activities	3,877,640.00
5. Sanitation and Environmental Protection Program-Maintenance of City Gov't. facilities Other structures solid waste related	1,122,360.00
Total	₱15,300,000.00

Table 11.2: CY 2014-2015 Budget

11.3 Funding Options

Trust Fund Creation

The main bottleneck of implementing SWM program for LGU's is funding or how to source out financing for its implementation on a regular basis. The common source of funds is actually taken from the coffers of the 20% Development Fund which is apparently dwindling due to a significant number of emerging cities.

Thus, San Carlos City tries to make innovation by establishing a solid waste management trust fund. This fund is intended to finance solid waste management projects without passing the common procedural steps of having an SP approval. The source of these funds mainly comes from the sales of recyclables, compost and other potential wastes classified as non-contaminated residuals otherwise known as alternative fuel and raw materials or AFR and cash award incentives from various Provincial, Regional and National SWM competition.

At present, we have generated more or less Php 1 Million Pesos in the Fund Set-Up under General Fund (Trust Fund Liability – 439). *Please find matrix for breakdown*

Trust Fund Account (Trust Fund Liability -439)	Amount in Pesos As of (December 2014)	Remarks
Sales of Recyclables	Php 547,605.15	Sales still on going
Sales of Compost	452,591.00	
Cash Award Incentives	810,000.00	
Total	Php 1,810,196.15	

Table 11.3: Matrix on Sales of Recyclables and Compost

11.4 Cost Evaluation and Comparison

The City of San Carlos **has Php115** per service capita based on the overall appropriation for solid waste management programs against the total population of 133,000 inhabitants which is still dependent on government subsidy.

11.5 Summary



Year	Investment Cost	Annual Cost	Annual Revenues
2007	Php 7.5 Million	Php 15.30 Million	
2008		11.35	
2009		10.35	
2010		15.35	
2011		15.35	
2012		15.35	
2013		15.35	
2014		15.35	
2015		15.35	

Table 11.6: Summary of Investment Cost and Annual Cost per year

12. Plan Implementation

The matrix presented in 12.1 were already accomplished, however, Item 2, 4a & 4b is the main focus for the next 10 years 2015-2024 for the sustainability of the program implementation

12.1 Phases and Responsibilities

SWM Program Components	Office/Person Responsible
Milestone 1. New Eco-Center established and operational	
ACTIVITIES	CEMO
Site Assessment <ul style="list-style-type: none"> • Evaluation of 12 possible Eco-Center Sites • Geological Site Pre-Assessment • Hydro-Geological Site Assessment • Geological Site Assessment • Establishment of three (3) GW monitoring wells in So. Mabuni 	
Site Acquisition <ul style="list-style-type: none"> • Facilitate documents for the Lease Contract 	



<ul style="list-style-type: none"> Formulate Docs for Access Road & Right of Way <p>Preliminary Site Development and Permit Procedure</p> <ul style="list-style-type: none"> Preparing clay sample for Test in DOST, Manila Permeability test for clay sample Site survey in So Mabuni Requirements for Notice to Proceed for MRF and Composting issued by DENR, Iloilo <p>Site Development</p> <ul style="list-style-type: none"> MRF Installation, Fencing, Composting area, Drainage and Water Treatment construction Construction of first phase of SLF to complete ECO-CENTER <p>Site Operation</p> <ul style="list-style-type: none"> MRF final segregation and sorting of waste Composting of biodegradable materials Processing of recyclable materials Landfilling of residuals Environmentally-sound disposal of hazardous and special waste Environmentally-sound disposal of biodegradable hospital waste Monitoring of underground water contamination Monitoring of outcome (material quality control) 	
<p>Milestone 2. Systematic Collection System</p>	
<p style="text-align: center;">ACTIVITIES</p>	<p style="text-align: center;">CEMO</p>
<ul style="list-style-type: none"> Baseline collection data on current collection schedules, routes and fuel consumption Work-out a cost effective route and schedule for the city's garbage collection including coastal and upland barangays Follow-up & monitor compliance of collection route and schedule Briefing of collection crew for systematic implementation of No segregation, No collection Policy 	



Milestone 3. Cease and Desist Operation of Villarante Dumpsite	
ACTIVITIES	CEMO
<p>Rehabilitation and closure of Villarante Dumpsite</p> <ul style="list-style-type: none"> • Recovering river protection dike as foundation of enclosure • Leveling of first dumpsite section and extending of top cover starting from dike • Immediate Implementation of responsible and law complying ESWM on Villarante Dumpsite: • Stop of scavenging and playing of minors on dumpsite • Start-up of MRF operation • Monitoring of waste stream • Temporary installation of recycle facilities 	
OUTPUT:	
Milestone 4A. Institutionalize ESWM capability building and education through the City LGU (CEMO, DepEd)	
ACTIVITIES	CEMO
<ul style="list-style-type: none"> • Implementation of environmental education in schools' curricula • Environmental advocacy 	



Milestone 4B. Monitoring and Evaluation	
ACTIVITIES	CEMO
<ul style="list-style-type: none"> Facilitate coordinative and logistical follow through support re: ESWM IEC initiative for the 18 barangays of San Carlos City Preparation course of all MRF Operators “Ecological Operation of MRF” (segregation skills, waste stream monitoring, basic book keeping and marketing, etc.) 	
Milestone 4C. Enforcement and Compliance	
ACTIVITIES	CEMO
<ul style="list-style-type: none"> Preparation in the conduct of meetings/ seminar with BRGY Waste Officers for monitoring and enforcement of the city’s SWM Plan (e.g. module, content, etc.) Identification of all different enforcement groups and introduction seminars and WS about the laws etc. Conduct paralegal training/seminars for enforcement of the city’s SWM Ordinance 	

12.2 Milestones

- July 2002 - The LGU started their Information, Education & Communication Campaign (IEC) through Genesys Foundation, Inc.
- August 2004 - Assignment of Solid Waste Manager and establishment of the SWM Office by executive order
- June 2005 - 1st 10 year SWM Plan was approved from the SWM Board and submitted to National Solid Waste Commission (NSWC)



- November 2005 - Signing of lease contract for the San Carlos City Eco-Center (an area of about 6 hectares)
- September 2007 -Ribbon cutting ceremony of San Carlos Eco-Center after 1 & 1/2 years construction
- May 2008 Initiated closure of Villarante Dumpsite
- January 2010 – Creation of the Solid Waste Management Office
- January 2013 – Creation of City Environment Management Office
- January 2014 – Partnership with Holcim Cement for the Recovery of Selected Residual Wastes

12.3 Implementation Schedule

ACTIVITY	TARGET AUDIENCE	MESSAGE	METHOD	TIME FRAME
Reorientation on RA 9003	Barangay Council of the 18 barangays	Increase awareness relative to the role of the barangay	Symposium	Every month of January of the year
	School Administrators and the teacher in-charge in ESWM	Increase awareness relative to the effective implementation of the ESWM program of the school	Symposium	Every month of May of the year
	CEMO Staff (divided into 12 groups)	Increase awareness relative to the salient features of the law	Symposium	Every month
Conduct of the San Carlos City Search for the	18 Barangays	Ensure the sustainability and efficacy of the	Interview and couching by the evaluators	Every year



Most Environment Friendly Barangays		SWM programs of the 18 barangays		
Conduct of the San Carlos City Search for Sustainable and Eco-Friendly Schools	San Carlos City Schools	Ensure the sustainability and efficacy of the SWM programs of the San Carlos City schools	Interview and coaching by the evaluators	Every year
Massive Barangay Clean-up relative to the Earth Day Celebration	18 Barangays	To find possible solutions to the problematic areas within their respective barangays	Actual Clean-up	Every 22 nd of April
Localized Environment Week Celebration	18 Barangays, Schools, institutions	To raise awareness relative to the environmental programs of the city	Symposia, Exhibit, Film Showing	Every third week of June
Massive advocacy on the Plastic Ordinance of the city	18 Barangays	Plastic bags waste minimization	Recorda, Store to Store Campaign, Video Presentation	All throughout the year
International Coastal Clean-up Day	18 Barangays, Local and National Agencies	Engage people to remove trash and debris from beaches waterways and other water bodies and raise awareness on the context of the marine debris problem	Actual Clean-up	Every 3 rd Saturday of September
Joint Inspection with the Business Permit and Licensing Office of the city (JIT)	All business establishments of the city	Monitor compliance of the business establishments within the city	Store to Store inspection	All throughout the year



		relative to city ordinance 12-08 and 14-53		
Monitoring of the implementation of the Barangay ESWM Plan	18 Barangays	Ensure the sustainability of the SWM programs of the 18 barangays of the city	Meeting	Monthly
Deployment of the Law Enforcement Team	Law Enforcement Team	Strengthen the enforcement mechanism of the city specifically on the city ordinance no. 12-08 and 14-53	Issuance of citation tickets to the violators	All throughout the year

Table 12.3: Schedule of Implementation

References

- R.A. 9003 Implementing Rules & Regulations***
- The 1991 Local Government Code***
- Orientation Manual on Ecological Solid Waste Management – SWAPP, Manila***
- Capacity Building for Ecological Sanitation – IHP, UNESCO***
- Design Manual on Ecological Solid Waste Mgm’t. Facilities for Urban Settings-SWAPP***
- Guidelines of Safe Closure Plan – NSWMC, Manual***
- Guidelines on the Design & Construction of Sanitary Landfill – NSWMC, Manila***
- GENERAL ECOLOGY- Dep’t. of Biology, College of Arts & Sciences, UP Manila***