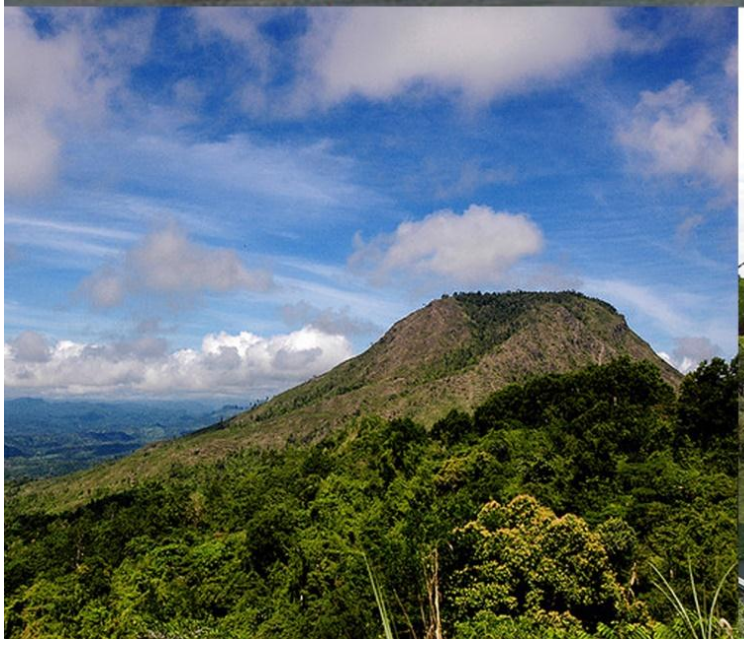
CITY GOVERNMENT OF BUTUAN

City Hall Bldg., J.P. Rosales Ave., Doongan, Butuan City

"Ensuring environmental sustainability and resiliency."

10 - YEAR INTEGRATED SOLID WASTE MANAGEMENT PLAN 2020 - 2029



Republic of the Philippines
OFFICE OF THE CITY MAYOR
City Hall Bldg., J.P. Rosales Ave., Doongan, Butuan City

HON. RONNIE VICENTE C. LAGNADA
City Mayor

MESSAGE

Madyaw nga adlaw kanatong tanan!

The City Government of Butuan is honored and proud with the release of the City's Integrated Solid Waste Management Plan that summarizes our research-based initiatives, strategies and approaches of the city's solid waste management agenda.

We ensured that this plan is compliant and anchored to the provisions set under the National Solid Waste Management Council Framework while customized to the local waste management situation for a more comprehensive and sustainable implementation of the plan.

We recognize the necessity of this plan that cohesively defines the city's SWM roadmap, and preserve the integrity of the city's ecological system.

We also commend the best effort rendered by the City Environment and Natural Resources Office in crafting this plan, giving and providing the parameters and settings that will narrow the gap related to the solid waste management challenges.

The City Government of Butuan is committed to the establishment and the institutionalization of a holistic and sustainable solid waste management program that ensure an ecological stability as an element in attaining our core mandate of providing an environment that is safe, dynamic and livable for our people to thrive and our economic agenda becomes doable.

Salamat kadyaw and God bless us all!

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DEFINITION OF TERMS

ATC	Authority To Close
BBKBV	Barangay Bantay Kahinlo Brigade Volunteer
BCESWMB	Butuan City Ecological Solid Waste Management Board
BCWM	Butuan City Waste Management
BESWMC	Barangay Ecological Solid Waste Management Committee
BLGU	Barangay Local Government Unit
CBMFM	Community-based Monitoring and Feedback Mechanism
CCA	Central Composting Area
CENRO	City Environment and Natural Resources Office
CHED	Commission of Higher Education
CM	Cubic Meter
CMO	City Mayors Office
CPSD	City Park Services Division
DAO	Department Administrative Order
DENR	Department of Environment and Natural Resources
DENR- EMB	DENR – Environmental Management Bureau
DepEd	Department of Education
DILG	Department of Interior and Local Government
DOE	Department of Energy
DOH	Department of Health
DTI	Department of Trade and Industry
ECC	Environmental Compliance Certificate
EO	Executive Order
EPPD	Environmental Planning and Protection Division
ESWM	Ecological Solid Waste Management
ESWMD	Ecological Solid Waste Management Division
GCT	Garbage Compactor Truck
GDT	Garbage Dump Truck
GGWMP	Green Ground Waste Management Program
Ha.	Hectare
HH	Household
HHW	Household Hazardous Waste
IEC	Information and Communication
IRA	Internal Revenue Allotment
IRR	Implementing Rules and Regulations
ISWMP	Integrated Solid Waste Management Plan
JICA	Japan International Cooperation Agency
Kl.	Kilogram
Km.	Kilometer
LGU	Local Government Unit
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
Mt.	Metric Ton
NSWMC	National Solid Waste Management Commission
NGO	Non-Government Organization
O & M	Operation and Maintenance

P.A	Per Annum
RA	Republic Act
PO	Peoples Organization
RPP	Recycling Program Planner
SK	Sanguniang Kabataan
SLF	Sanitary Landfill
SP	Sanguniang Panlungsod
SWM	Solid Waste Management
SWM – TWG	Solid Waste Management Technical Working Group
SWMP	Solid Waste Management Plan
WACS	Waste Assessment and Characterization Study

EXECUTIVE SUMMARY

The Ten Year Integrated Solid Waste Management Plan (ISWMP) of Butuan City was crafted in line with the provisions of Republic Act 9003 otherwise known as "Ecological Solid Waste Management Act of 2000", particularly Section 12 and 16 thereof respectively, that mandates every LGU to prepare its respective 10-year Integrated Solid Waste Management Plan, consistent with the provisions of NSWMC framework and implement the same for the safe and sanitary management of solid wastes generated in areas under its political coverage.

The same is prepared purposely to address several issues on the City's Solid Waste Management System and resolve the existing gaps related to the implementation of RA 9003. Also, provides mechanism and strategies to minimize waste generation through waste diversion and introduction of SWM technologies to achieve and institutionalize a better solid waste management system that will not only ensure the quality of life of all stakeholders but also preserve the integrity of a balance ecological system aiming towards a smart and green city in the future.

Towards this end, it aims to establish an integrated waste to energy facility in the city where all waste shall be diverted to energy and eventually avoid costly construction and operation of a Sanitary Landfill Facility (SLF) in the future. But meantime, while the feasibility study of waste to energy processing facility has still to be undertaken, the City Government shall implement strategies that address the existing issues and concerns, such as the following: (1) Establishment of Ecological Solid Waste Processing Compliant Facility; (2) Intensify IEC trainings on all SWM stakeholders; (3) Strict enforcement of existing SWM laws, policies, ordinances and other related issuances; (4) Strengthen monitoring and evaluation of SWM compliance of constituent barangays to RA 9003 and provision of incentives and awards system for best practices in the barangays; (5) Expand waste collection services;(6) Conversion of SLF to sorting, recycling and processing plant; (7) Provide sufficient number and equipped enforcers; (8) Ensure budget allocation for SWM equipment and facilities.

Chapter I of this plan exerts the importance and purpose of the creation of the Ten-year ISWM Plan, while **Chapter II** presents the Butuan City Profile from its geographical location, history and population. Also, discusses the literacy rate, economic profile and the land use of the City. **Chapter III** emphasizes the current state

of the City's solid waste management and establishes underlying principles of institutional arrangements of Solid Waste Management System in pursuance with existing national laws and ordinances and in collaboration with various stakeholders and partner agencies.

It also articulates the existing operation and implementation of some programs such as waste collection, waste transfer and disposal to the Sanitary Landfill (SLF). Likewise the importance of solid waste education programs (IEC Approach) for better understanding of SWM governing laws, issuances as well as the Solid Waste Management budget allocation, revenue and expenses and indicates **several key issues on SWM system** in the City.

Chapter IV highlights some relevant data and figure relative to solid waste generation of the City. How the WACS was conducted in partnership with Caraga State University (CarSU) Mathematical and Statistical Computing and Research Center (MSCRC) and determines the volume in every category such as (1) households; (2) public markets; (3) general stores; (4) food establishments: (5) industries; (6) institutions; (7) recreation centers; (8) service centers and health-related agencies. Waste generation average for the city of Butuan (household + non-household) is **0.689 kg/capita/day. Chapter V** presents the existing local laws and regulations pertaining to the Solid Waste Management aside from national laws which are being implemented by the City. **Chapter VI** sets the vision and mission of Butuan City, being a highly urbanized city and as capital of Caraga Region to take the lead in implementing a smart, science-based and people-oriented mechanisms in resolving the solid waste problem. It highlights the City's ultimate aim of converting solid wastes into energy and meantime that feasibility study for such is yet to be undertaken, it proposes to undertake measures like implementing alternative efficient technologies particularly the Ecological Solid Waste Processing Compliant Facility with the goal of achieving **95-100% waste diversion** rate by 2029. The same lays down some programs, projects and activities that are relevant for the effective and efficient implementation of the plan such as, establishment of Clustered MRF and Compost Facilities, establishment of Centralized Material Recovery Facility, and Construction of Solid Waste Integrated Sorting & Recycling Plant.

Chapter VII discusses the solid waste management system whereby waste reduction at source is being promoted for strict implementation by major waste

generators such as public markets, commercial and business areas, institutions and agencies, schools, and households. Different approaches are suggested to be applied in addressing waste reduction at source like provision of additional SWM equipment that support efficient SWM System are necessary. The same features the previous SWM facilities such as Doongan Dumpsite and Dulag Dumpsite which are now under Safe Closure and Rehabilitation proceedings in close coordination with DENR-EMB Caraga Region. **Sanitary Landfill** located at Barangay Dumalagan is the existing facility of City Government of Butuan which granted and having an approved six (6)-hectare lot through Special Land Use Permit No. SUP-R13-001-SLF by the DENR.

Chapter VIII presents the implementation strategy set forth by this plan using the logical framework to implement and monitor solid waste management program and projects which aim to deliver its objectives on waste diversion, institutionalize collection, effective IEC and Intensify enforcement. **Chapter IX** discusses the institutional aspects on the components of Solid Waste Management system in the City. Further emphasizes the role of each office/agency/board pertaining to SWM implementation. **Chapter X** highlights the social and environmental aspects relative to SWM implementation with an aim of changing and transforming people's attitude and behavior, emphasizing coherence on shared virtues that waste management is a personal responsibility.

Chapter XI lays down the cost estimates and financial aspect of the plan for each identified proposed program/project/activity to be implemented in alignment with the City's SWM budget allocation, revenue and expenses which presented in a table type with corresponding Gantt chart.

Chapter XII focuses on the alignment of the plan implementation that employs SWM program and project components together with its implementing agency that falls under their mandates and the time frame of Solid Waste Management projects and programs that covers the whole ten-year target.

CHAPTER – I
INTRODUCTION

1.1 Purpose

Butuan City is the capital City of Caraga Region. A highly-urbanized City characterized with a growing population as a result of rapid economic development and industrialization. In 2015, The PSA reported that Butuan City's population was 337,063 projected with an increasing annual growth population rate of 2.02%. The City's growing population corresponds to an increase in its ecological footprint which is immensely correlated with the increasing volume of generated wastes yearly and the demand for an efficient, comprehensive and integrated solid waste management program.

The people of Butuan City envisions a smart and green city in the next 10 years (CDP 2019). With this, the thrust of the City Government is also geared towards sustainable development by ensuring ecological stability and championing public health. With this the City Government of Butuan plans to expand, intensify and modernize its solid waste management system in all its constituent barangays, especially in the City's central business district and urbanizing barangay by the year 2029.

The current state of Solid Waste Management (SWM) in Butuan City is very limited and inefficient: (1) Some of the Barangay Councils lack appropriate knowledge on solid waste management; (2) There are still stakeholders which do not fully practice proper waste segregation at source; (3) Dysfunctional and absence of Material Recovery Facilities (MRFs) in some barangays; (4) Prevalence of illegal dumping and open burning; (5) Technical design and location of sanitary landfill need to be improved; and (6) Lack of SWM enforcers; (7) Insufficient SWM equipment and facilities; (8) Insufficient SWM fund allocation; (9) Inadequate SWM technology.

The 10-year Integrated Solid Waste Management Plan (ISWMP) of Butuan City is in line with the provisions of Republic Act 9003 known as "Ecological Solid Waste Management Act of 2000. It aims to establish an integrated waste to energy facility so that all wastes shall be diverted and eventually avoid costly construction and operation of a Sanitary Landfill Facility (SLF) in the future. In order to address the existing issues and concerns, the plan likewise aims to implement the following strategies, to wit;(1) Intensify IEC trainings on all SWM stakeholders; (2) Strict enforcement of existing SWM laws, policies, ordinances and other related issuances; (3)Strengthen monitoring and evaluation of SWM compliance of constituent barangays to RA 9003 and provision of incentives and awards for best practices; (4) Expand waste collection services;(5) Conversion of SLF to sorting, recycling and processing plant; (6) Provide sufficient and equipped enforcers; (7) Ensure budget allocation for SWM equipment and facilities.

In addition, the 10 year SWMP will provide a holistic framework for the implementation of an efficient SWM program. It will address and resolve the existing gaps related to the implementation of RA 9003. Moreover, this plan is structured to encourage and strengthen public participation and collaboration among various government agencies, institutions and non-governmental organizations (NGOs). The strategies being presented in this ISWMP is a requirement in attaining the City

Government's responsibility of protecting and advancing the right of the people to a balanced and healthful ecology as stipulated in the 1987 Philippine Constitution.

1.2 Waste Analysis and Characterization Study (WACS)

Butuan City conducted Waste Analysis and Characterization Study (WACS) sometime on CY-2019 in partnership with Caraga State University through its Mathematical and Statistical Computing and Research Center (CSU-MSCRC). The study was conducted to determine the waste generation in terms of average per capita and obtain the household and non-household solid wastes data in Butuan City particularly, households in urban and urbanizing barangays as its target population. There were forty-four (44) barangays, (27 urban and 17 urbanizing barangays) that participated in the study. In addition, commercial establishments and centers such as industries, public markets, general stores, institutions, service and recreation centers, and health care centers within Butuan City were also considered in the study.

Specifically, the project was focused on (1) identification of the major solid wastes generated in Butuan City; (2) calculation of the volume of solid wastes generated from the various sectors; (3) development of database for ecological solid wastes; (4) characterization of solid wastes based on potential uses; (5) measurement of the household's and non-household's willingness-to-pay (WTP) for the urban solid waste management improvement.

For household waste generators, the study employed a two-stage random sampling design to determine the number of sample households. The target population of households was stratified according to its geographical and political boundary, and these households were identified in every barangay. These barangays were further classified as urban and urbanizing barangays. Subsequently, the households were further stratified according to income level (high, middle, or low-income class).

The total number of households was determined using the sample size formula for estimating proportion where **n** is the sample size, **N** is the total number of households, $\mathbf{z_{a/2}}$is a standard normal variate with value depends on the level of confidence is set, **p = q = 0.5** (gives the highest sample size), and ME as the margin of error.
The formula is given below:

$$n = \frac{N(z_{\alpha/2})^2 pq}{(N-1)ME^2 + (z_{\alpha/2})^2 pq}$$

For the household survey, there were a total of 52,340 households in the identified barangays (PSA 2015). Setting a 95% level of confidence ($z_{a/2}$= 1.96), p = q = 0.5, and a margin of error of 5%, the sample size was computed to be n=385. Notice that some barangays are composed of relatively lesser number of households thus if proportional allocation of the given sample size is applied would yield no or have only few respondents. The sample size was further adjusted resulting to n=427.

Meanwhile, the sample size for non-household was proportionally allocated based on the nature of business (n=368). For the market survey, three categories were

considered according to size (i.e., small, medium and large-sized markets). The computed sample size was n=148 which was proportionally allocated to different markets. Table 1, Table 2 and Table 3 shows the number of samples for every sectors.

Table 1. Sample size allocation for household waste generators.

No.	Name of Barangay	Number of households	Proportion relative to the total no. of households in both urban and urbanizing barangays (B)	No. of Samples	Adjusted No. of Samples
Urban Barangay	**(based on 95% level of confidence and 5% margin of error)**				
1	Agao	171	0.003	1	5
2	Baan Riverside	1,207	0.023	9	9
3	Bayanihan	1,084	0.021	8	8
4	Bit-os	663	0.013	5	5
5	Buhangin	993	0.019	7	7
6	Dagohoy	327	0.006	2	5
7	Diego Silang	237	0.005	2	5
8	Fort Poyohon	1,096	0.021	8	8
9	Golden Ribbon	851	0.016	6	6
10	Holy Redeemer	1,693	0.032	12	12
11	Humabon	32	0.001	0	5
12	Imadejas	570	0.011	4	5
13	Jose P Rizal	1,330	0.025	10	10
14	Lapu-lapu	256	0.005	2	5
15	Leon Kilat	42	0.001	0	5
16	Limaha	1,468	0.028	11	11
17	Mahogany	1,187	0.023	9	9
18	Maon	1,105	0.021	8	8
19	New Society Village	391	0.007	3	5
20	Obrero	2,015	0.038	15	15
21	Ong Yiu	1,020	0.019	7	8
22	Rajah Soliman	109	0.002	1	5
23	San Ignacio	683	0.013	5	5
24	Sikatuna	588	0.011	4	5
25	Silongan	10	0.000	0	5
26	Tandang Sora	899	0.017	7	7
27	Urduja	20	0.000	0	5
SUBTOTAL	**20,047**	**0.383**	**146**	**187**	
Urbanizing Barangays					
1	Agusan Pequeno	1,089	0.021	8	8
2	Ambago	2,830	0.054	21	21
3	Ampayon	2,859	0.055	21	21
4	Baan Km 3.	2,468	0.047	18	18
5	Bading	1,048	0.020	8	8
6	Bancasi	1,027	0.020	7	7
7	Bonbon	1,112	0.021	8	8
8	Doongan	2,969	0.057	22	22
9	Libertad	5,787	0.111	42	42
10	Lumbocan	1,031	0.020	8	8
11	Mahay	862	0.016	6	6
12	Masao	358	0.007	3	5
13	Pagatpatan	1,195	0.023	9	9
14	Pangabugan	583	0.011	4	5
15	San Vicente	3,437	0.066	25	25
16	Tiniwisan	933	0.018	7	7
17	Villa Kananga	2,705	0.052	20	20
Subtotal	32,293	0.617	236	239	
GRAND TOTAL	**52,340**	**382**	**427**		

Table 2. Sample size allocation for non-household waste generators.

Type of establishment	Population size	Sample size
Food Establishments	1187	51
General Stores	4051	175
Industries	619	33
Institutions	676	17
Service Centers	1781	67
Hotels/ Inns/ Pension Houses	402	11
Health Establishments (health centers, hospitals)	199	8
Total	**8915**	**36**

Table 3.Sample size allocation for market waste generators.

Type of establishment	Population size (No. of stalls)	Sample size
Langihan Market (Large)	893	120
Ampayon Market (Medium)	75	24
Tiniwisan Talipapa (Small)	10	4
Total	**978**	**148**

1.3 Acknowledgement

Integrated Solid Waste Management Plan (2020-2029) for the City of Butuan.

Planning Committee

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5. City Budget Office
6. Office of the City Planning and Development Coordinator
7. Butuan City LTTMO

8. DENR-EMB
9. City ENRO, Ecological Solid Waste Management Division
10. City ENRO, Enforcement Division
11. Philippine Statistics Authority
12. BXU WACS 2019 by the Caraga State University through Mathematical & Statistical Computing & Research Center (MSCRC)
13. Municipality of Buenavista, Agusan del Norte
14. Barangay Council of Dumalagan
15. Barangay Council of Dulag
16. Barangay Council of Doongan

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CHAPTER – II
BUTUAN CITY PROFILE

2.1 Location and History

Butuan City was originally located in Pinamanculan by the banks of Masao River, about a kilometer from the barrio of Libertad. Finding the site less than ideal because of the floods, the people moved to Baog, now the municipality of Magallanes, at the mouth of Agusan River. Later they again transferred to Lapaca, now known as Linungsuran in Banza, about five kilometers inland of Agusan River. Still troubled by floods, the people once more settled some 80 years ago this time permanently, in a higher place called Agao, which is the present site of the City proper.

Description of Butuan is not complete without infusing it with the significance of the Agusan River. It is the Agusan River and its tributaries that provide the valley with rich soil from periodic floods and its serpentine route through the length of the province provided people with easy means of transportation for trade and commerce and encouraged settlements along its banks. The Agusan River greatly helped the booming logging industry and made Butuan the “Timber City of the South”.

Butuan City sprawls across the Agusan River nine (9) kilometers inland south of the mouth of the river. Towards this mouth, the north and sea ward, run fertile rice lands. Half way round of the city of the Southwest, roll of gently sloping hills, over which Mt. Mayapay looms. To the East the majestic Ilong-Ilong and Diwata mountain ranges protect the entire valley from fierce Pacific storms.

It is very difficult to pinpoint the exact time when the name Butuan first emerged. Certainly the name Agusan came into being upon the creation of the province in 1914. Before this, the entire area had been known as such as can be borne out by old historical records.

Much controversy and debate have been generated on whether the first mass was held in Limasawa, Leyte or in Masao, Butuan City that it would be superfluous to go into the arguments in the space allotted here. Definitely however, Ferdinand Magellan did drop anchor by the mouth of Agusan River 1521 and held mass to commemorate the event. This is held out by a monument erected at the site in 1872, by then Spanish District Governor, Don Jose Maria Carvallo to honor Ferdinand Magellan. A chieftain known to have ruled Butuan during the pre-Spanish period was Rajah Siaui or Siagu. He was followed by more datus most known is Datu Silongan. He was the ruling chieftain by the time the Spaniards sometime came after the death of Magellan.

He returned to Butuan in full force and succeeded in converting Silongan into Christianity and baptized as Felipe. He along with his brother, Macara-ay came to this place in Jolo, which explains the similarity in the dialects of the regions. The conversion of the natives in larger scale into Christianity started sometime in 1875 by Father Saturnino Urios, a Jesuit who was known as the “Apostle of Agusan “. The Butuan parochial school now called Father Saturnino Urios University was named after him. Among the Spanish navigators who visited Butuan were Francisco de Castro,

Villalobos and Legaspi. The latter was said to have been well received by Datu Magbuaya, the chieftain of Butuan. When Agusan fell into the hands of the revolutionary government of Aguinaldo in 1889, the first guerilla groups were organized by Gomercindo Flores in Butuan and Andres Atega in Cabadbaran to fought American invaders. A memorable encounter between the native forces and the American troops took place in February 1901 near San Mateo and the legendary island of Bacua. It was through the mediation of Fr. Urios that the insurgents were persuaded to lay down their arms. The American occupation of Butuan took effect without further incident and in accordance with Public Law No. 82, the first municipal election in Butuan was held in March 1902.

Butuan was one of the towns which bore the brunt of the Japanese occupation. With the exception of some public and private buildings, the whole town was razed to the ground when the guerilla forces attacked the enemy garrison in the town during the middle of 1943. After liberation, rehabilitation of the town was started. The civilian populace started returning to Butuan, first building shanties on the ruins of war, later houses of stronger frame. Schools were opened once more with the students bringing their own chairs to and from school and classes were conducted in the different available houses which were not occupied. Then October 20, 1948, a big fire wiped out the town. Again Butuan witnessed a great building reconstruction boom. At the return of the fifties, Butuan started experiencing the logging boom and which stayed up to the middle seventies. The boom drew businessmen and fortune seekers from other provinces and before long, the population of Butuan soared. Subdivisions started to sprout and the residential area grew in size, growing up to tenfold the original size than it was during the liberation period.

The lethargic town suddenly became a fast moving metropolis. A second conflagration on December 9, 1952 again burned almost the entire town. Another fire hit Butuan occurred on May 13, 1960 which destroyed the northern portion of the city. On May 19, 1970, another fire destroyed the commercial section of the city covering four blocks. The last big fire hit Butuan occurred on March 6, 1971 destroying Obrero and Poyohon.

The boom of the logging industry inspired and prompted Congressman Marcos M. Calo to file a bill creating the City of Butuan.

Butuan became a city by virtue of Republic Act No. 523 otherwise known as the City Charter of Butuan, which formally converted the municipality into a city, on August 2, 1950. From a chartered City, Butuan was reclassified again into a Highly Urbanized City on February 7, 1985, pursuant to the provisions of Memorandum Circular No. 83-49 of the Ministry of Local Government. The reclassification was based on its income and population as certified by the Ministry of Finance and National Census and Statistics Office.

On February 23, 1995 a Republic Act 7901 was approved by His Excellency President Fidel V. Ramos creating the four (4) provinces of Agusan del Norte, Agusan del Sur, Surigao del Norte, Surigao del Sur and the two (2) cities; Butuan and Surigao City as Region 13- Caraga Administrative Region under the Congressional leadership of Hon. Charito B. Plaza. Butuan City is the Regional Center.

2.2 Population

Total Population. Based on the 2015 Census of Population and Housing (CPH), Butuan City, a highly urbanized city in the province of Agusan del Norte, posted a total population of 337,063 persons as of 2015. Which shares 12.98% of 2,596,709 of the entire population of Caraga Region, and 0.33% of the Philippines' total population of 100, 981,437 as of 2015 (actual census). This count has an increase of 27,354 persons more than the recorded population of 309,709 in the censal year of 2010 and more than twice the population size of 131,094 persons as recorded in 1970.

Most and Least Populated Barangays. Among the 86 barangays that comprise Butuan City, Barangay Libertad is the most densely populated with a population size of 6.44% or 21,703 of the total population of the city. It is followed by Barangay San Vicente 4.80% or 16,187, Doongan 4.07% 13,728, Ampayon 3.77% or 12,720, Ambago 3.75% or 12,656, Baan Km.3 3.35% or 11,308, Villa Kananga 3.31or 11,173. Some of the barangays contributed less than 3.0% each while the urban barangays with a small juridical area mostly located along commercial districts like barangay Sikatuna has a 0.01% portion of the total population of the city followed by Urduja 0.02%, Humabon .04%, Leon Kilat 0.05%, Rajah Soliman 0.13% and Agao 0.23%.

Male to Female Ratio. Of the 308,600 household population in 2010, males accounted for 50.7 percent while females comprised 49.3 percent. These figures resulted in a sex ratio of 103 males for every 100 females. In 2000, the sex ratio recorded was the same as that in 2010.

Age Groups and Classification. In 2015, the median age of the population of the city was 22.7 years, which means that half of the population was younger than 22.7 years. This is higher than the median age of 20.0 years that was recorded in 2000.

Moreover, 34.1 percent of the household population were under 15 years old. Persons aged 0 to 4 years (11.6 percent) comprised the largest age group, followed by those in the age groups 5 to 9 years (11.4 percent) and 10 to 14 years (11.0 percent). Males outnumbered females in the age groups 0 to 54 years. On the other hand, there were more females than males in the older age groups (55 years and over).

The voting-age population (18 years and over) accounted for 59.4 percent of the household population of the city in 2010, up from 54.0 percent in 2000. The proportion of males and females among the voting-age population is equal at 50.0 percent.

Table 4.Proportion of males and females of Butuan City

AGE GROUP	BOTH SEXES	MALE	FEMALE	SEX RATIO
Under 1	7, 094	3, 721	3, 373	110.3
1 – 4	28, 680	14, 926	13, 754	108.5
5 – 9	35, 284	18, 322	16, 962	108
10 – 14	34, 022	17, 623	16, 399	107.5
15 – 19	33, 742	16, 997	16, 745	101.5
20 – 24	28, 986	14, 621	14, 365	101.8
25 – 29	22, 943	11, 630	11, 313	102.8
30 – 34	20, 900	10, 607	10, 293	103.1
35 – 39	19, 111	9, 700	9, 411	103.1
40 – 44	18, 232	9, 210	9, 022	102.1
45 – 49	15, 868	8, 036	7, 832	102.6
50 – 54	13, 360	6, 723	6, 637	101.3
55 – 59	10, 084	5, 019	5, 065	99.1
60 – 64	7, 403	3, 559	3, 844	92.6
65 – 69	5, 049	2, 369	2, 680	88.4
70 – 74	3, 895	1, 739	2, 156	80.7
75 – 79	2, 155	921	1, 234	74.6
80 – Over	1, 792	694	1, 098	63.2
TOTAL	**308, 600**	**156, 417**	**152, 183**	**102.8**

Source: Philippine Statistics Authority: Census of Population and Housing 2015

In 2015, the young dependents (0 to 14 years) comprised 34.1 percent of the household population while the old dependents (65 years and over) posted a share of 4.2 percent. The working-age population (15 to 64 years) accounted for the remaining 61.8 percent. The overall dependency ratio was 62, which indicates that for every 100 working-age population, there were about 62 dependents (55 young dependents and seven old dependents). This ratio is lower than the dependency ratio in 2000, which was recorded at 74 dependents per 100 working-age population (69 young dependents and five old dependents).

Marital Status. Of the household population 10 years old and over, 44.1 percent were never married while 44.0 percent were married. The rest of the population were in common-law/live-in marital arrangement (6.3 percent), widowed (4.2 percent), and divorced/separated (1.2 percent). Among the never-married persons, 54.1 percent were males while 45.9 percent were females. For the rest of the categories for marital status, the females outnumbered the males.

Table 5. Marital Status

MARITAL STATUS	BOTH SEXES	MALE	FEMALE
Single	104, 860	56, 716	48, 144
Married	104, 426	51, 858	52, 568
Widowed	9, 969	2, 216	7, 753
Divorced/Separated	2, 913	1, 098	1, 815
Common Law/Live-In	14, 948	7, 382	7, 566
Unknown	426	178	248
TOTAL	**237, 542**	**119, 448**	**118, 094**

Source: Philippine Statistics Authority: Census of Population and Housing 2015

Educational Attainment. Of the household population aged five years and over, 32.8 percent had attended or completed elementary education, 34.5 percent had reached or finished high school, 11.3 percent were college undergraduates, and

12.1 percent were academic degree holders. More females pursue higher levels of education than male, as majority of those with academic degrees (54.8 percent) and post baccalaureate courses (60.1 percent) were females.

Table 6. Educational attainment presentation.

EDUCATIONAL ATTAINMENT	BOTH SEXES	MALE	FEMALE
No Grade Completed	8, 805	4, 854	3, 951
Pre-School	9, 071	4, 671	4, 400
Elementary	89, 480	48, 433	41, 047
High School	94, 125	46, 230	47, 895
Post-Secondary	6, 586	3, 395	3, 191
College Undergraduate	30, 938	14, 964	15, 974
Academic Degree Holder	32, 901	14, 855	18, 046
Post-Baccalaureate	917	366	551
Not Stated	3	2	1
TOTAL	**272, 826**	**137, 770**	**135, 056**

Source: Philippine Statistics Authority: Census of Population and Housing 2015

Persons with Disability (PWD). In 2015, around 4,100 persons or 1.3 percent of the 308,600 household population had a disability. This proportion of persons with disability (PWD) is higher than the proportion in 2000, which was 1.1 percent of the 266,200 household population of the city during that year. The number of PWD for the same year was around 3,000.

Of the 272,826 household population five years and over, 3.1 percent (or 8,475 persons) had at least one type of functional difficulty either in seeing, hearing, walking or climbing steps, remembering or concentrating, self-caring (bathing or dressing), or communicating. There were more females (51.8 percent) than males (48.2 percent) among those persons with at least one type of functional difficulty.

Moreover, of the total 8,475 persons aged five years and over with at least one type of functional difficulty, 72.6 percent reported difficulty in seeing, even if wearing eyeglasses. There were 19.5 percent who had difficulty in walking or climbing steps; 16.8 percent had difficulty in hearing, even if using a hearing aid; 13.2 percent had difficulty in remembering or concentrating; 11.0 percent had difficulty in communicating; and 9.6 percent had difficulty in self-caring (bathing or dressing).

Table 7. Persons with disability sex ranges.

AGE GROUP	BOTH SEXES	MALE	FEMALE
Below 15	896	499	397
15 – 64	2, 454	1, 349	1, 105
65 and over	770	353	417
TOTAL	**4, 120**	**2, 201**	**1, 919**

Source: Philippine Statistics Authority: Census of Population and Housing 2015

Table 8. Functional disability for both sexes.

TYPE OF FUNCTIONAL DISABILITY	BOTH SEXES	MALE	FEMALE
Household population 5yrs old and over with at least one type of functional difficulty	8, 475	4, 086	4, 389
Difficulty in seeing, even if wearing glasses	6, 150	2, 836	3, 314
Difficulty in hearing, even if using hearing aid	1, 421	714	707
Difficulty in walking or climbing steps	1, 649	860	789
Difficulty in remembering or concentrating	1, 119	544	575
Difficulty in self-caring (bathing or dressing)	810	416	394
Difficulty in communicating	929	507	422

Source: Philippine Statistics Authority: Census of Population and Housing 2015

Overseas Filipino Workers. Of the 237,542 household population 10 years old and over in Butuan City, 1.3 percent (or 3,150 persons) were overseas workers. Male overseas workers outnumbered their female counterparts as they comprised 58.3 percent of all overseas workers from this city. Overseas workers aged 45 years old and over made up the largest age group, comprising 21.7 percent of the total overseas workers from this city in 2010, followed by the age groups 30 to 34 years (19.3 percent), 35 to 39 years (18.7 percent), and 25 to 29 years (17.3 percent).

Table 9. Overseas Filipino workers for both sexes.

AGE GROUP	BOTH SEXES	MALE	FEMALE
Below 20	114	67	47
20 – 24	201	96	105
25 – 29	545	240	305
30 – 34	607	343	264
35 – 39	590	361	229
40 – 44	408	250	158
45 – Over	685	479	206
TOTAL	**3, 150**	**1, 836**	**1, 314**

Source: Philippine Statistics Authority: Census of Population and Housing 2015

The number of households in 2015 was recorded at 65,642, higher by 15,369 households compared with the 50,273 households posted in 2000. The average household size in 2010 was 4.7 persons, lower than the average household size of 5.3 persons in 2000.

Housing Units. A total of 64,286 occupied housing units were recorded in Butuan City in 2015. This translates to a ratio of 102 households for every 100 occupied housing units, with 4.8 persons per occupied housing unit. In 2000, there were 103 households per 100 occupied housing units, and 5.5 persons per occupied housing unit.

In 2015, the proportion of occupied housing units with outer walls made of wood decreased from 67.8 percent in 2000 to 58.6 percent in 2010. The proportion of occupied housing units with outer walls made of concrete/brick/stone increased from 14.8 percent in 2000 to 27.2 percent in 2010. Those with outer walls made of half concrete/brick/stone and half wood decreased from 9.3 percent in 2000 to 8.7 percent

in 2010. Meanwhile, majority (72.0 percent) of the occupied housing units in 2010 had roofs made of galvanized iron/aluminum, higher than the proportion recorded in 2000 at 60.9 percent. Those with roofs made of cogon/nipa/anahaw decreased from 32.6 percent in 2000 to 23.7 percent in 2010.

In 2015, of the total 65,642 households, 53.3 percent owned or amortized the lots that they occupied. The corresponding figure in 2000 was lower at 44.3 percent. Moreover, 28.5 percent of the households occupied lots which were rent-free but with consent of the owner, 11.0 percent rented the lots that they occupied while 4.0 percent occupied lots which were rent-free but without consent of the owner.

Table 10.Construction materials used for roofing and walls.

Construction Materials of the Roof									
Construction materials of the outer walls	Total Occupied Housing units	Galvanized iron/ Aluminum	Title/ Concrete/ Clay tile	Half Galvanized Iron and Half Concrete	Wood	Cogon/ Nipa/ Anahaw	Makeshift/ Salvaged/ Improved Material	Asbestos/ Others	Not reported
Total	64, 286	46, 307	260	756	1,356	15, 242	222	143	-
Concrete/bricks/stone	17, 483	17, 088	144	58	24	142	6	21	-
Wood	37, 671	23, 405	84	381	1,215	12, 344	147	95	-
Half concrete/bricks/stone	5, 584	5,030	23	266	30	230	1	4	-
Galvanized iron/aluminum	97	50	8	10	11	17	1	-	-
Bamboo/sawali/cogon/nipa	3.035	567	-	34	71	2, 344	10	9	-
Asbestos	23	11	-	2	-	-	-	10	-
Glass	10	9	-	1	-	-	-	-	-
Makeshift/salvaged/improvised materials	176	46	-	1	5	75	49	-	-
Others/not reported	199	97	1	2	-	87	8	4	-
No walls	8	4	-	1	-	3	-	-	-

Source: Philippine Statistics Authority: Census of Population and Housing 2015

Table 11. Tenure status of lots.

TENURE STATUS OF LOTS	NO. OF HOUSEHOLDS
Owned / Being amortized / owner-like	34, 968
Rented	7, 198
Rent – free with consent of owner	18, 683
Rent – free without consent of owner	2, 645
Not reported	10
Not applicable	2, 138
TOTAL	**65, 642**

Source: Philippine Statistics Authority: Census of Population and Housing 2015

Projected Population Butuan City's total population is expected to increase at annual growth rate of 1.98 %. By 2022, total population is projected to be 492,205. At the end of the SWMP period, it would increase to 564,193. Increasing population is due mainly to migration caused by rapid urbanization and industrialization of the City.

Table 12. Projected population of Butuan City 2020-2029.

BARANGAY	2020	with Migrants	2021	with Migrants	2022	with Migrants	2023	with Migrants	2024	with Migrants	2025	with Migrants	2026	with Migrants	2027	with Migrants	2028	with Migrants	2029	with Migrants
BUTUAN CITY	450,000	**472,500**	458,415	**482,253**	466,987	**492,205**	475,720	**502,360**	484,616	**512,724**	493,048	**522,631**	501,627	**532,728**	510,356	**543,018**	519,236	**553,505**	528,271	**564,193**
URBAN																				
1. Maon	6,771	7,110	6,898	7,257	7,027	7,407	7,158	7,559	7,292	7,715	7,419	7,864	7,548	8,016	7,680	8,171	7,813	8,329	7,949	8,490
2. Golden Ribbon	5,117	5,373	5,213	5,484	5,310	5,597	5,410	5,713	5,511	5,831	5,607	5,943	5,704	6,058	5,804	6,175	5,905	6,294	6,007	6,416
3. Agao	1,039	1,091	1,058	1,113	1,078	1,136	1,098	1,160	1,119	1,183	1,138	1,206	1,158	1,230	1,178	1,253	1,198	1,278	1,219	1,302
4. Rajah Soliman	621	652	632	665	644	679	656	693	669	707	680	721	692	735	704	749	716	764	729	778
5. Silongan	882	927	899	946	916	965	933	985	950	1,005	967	1,025	984	1,045	1,001	1,065	1,018	1,085	1,036	1,106
6. Diego Silang	1,212	1,273	1,235	1,299	1,258	1,326	1,282	1,353	1,305	1,381	1,328	1,408	1,351	1,435	1,375	1,463	1,399	1,491	1,423	1,520
7. Dagohoy	1,571	1,650	1,601	1,684	1,631	1,719	1,661	1,754	1,692	1,790	1,722	1,825	1,752	1,860	1,782	1,896	1,813	1,933	1,845	1,970
8. Lapu-lapu	1,515	1,591	1,544	1,624	1,572	1,657	1,602	1,692	1,632	1,727	1,660	1,760	1,689	1,794	1,719	1,829	1,748	1,864	1,779	1,900
9. Urduja	111	116	113	119	115	121	117	124	119	126	121	129	124	131	126	134	128	136	130	139
10. Sikatuna	57	60	58	62	60	63	61	64	62	65	63	67	64	68	65	69	66	71	67	72
11. Humabon	183	192	186	196	190	200	193	204	197	208	200	212	204	217	207	221	211	225	215	229
12. Tandang Sora	5,135	5,391	5,231	5,503	5,328	5,616	5,428	5,732	5,530	5,850	5,626	5,963	5,724	6,079	5,823	6,196	5,925	6,316	6,028	6,438
13. Leon Kilat	218	228	222	233	226	238	230	243	234	248	238	253	243	258	247	263	251	268	255	273
14. Limaha	8,412	8,833	8,570	9,015	8,730	9,201	8,893	9,391	9,059	9,585	9,217	9,770	9,377	9,959	9,541	10,151	9,707	10,347	9,875	10,547
15. San Ignacio	3,521	3,697	3,586	3,773	3,653	3,851	3,722	3,930	3,791	4,011	3,857	4,089	3,924	4,168	3,993	4,248	4,062	4,330	4,133	4,414
16. Ong Yui	6,487	6,811	6,608	6,952	6,732	7,095	6,858	7,242	6,986	7,391	7,108	7,534	7,231	7,680	7,357	7,828	7,485	7,979	7,615	8,133
17. Port Poyohon	6,406	6,726	6,525	6,865	6,647	7,006	6,772	7,151	6,898	7,298	7,018	7,440	7,141	7,583	7,265	7,730	7,391	7,879	7,520	8,031
18. Obrero	13,049	13,701	13,293	13,984	13,541	14,273	13,795	14,567	14,053	14,868	14,297	15,155	14,546	15,448	14,799	15,746	15,057	16,050	15,319	16,360
19. Buhangin	5,884	6,178	5,994	6,305	6,106	6,435	6,220	6,568	6,336	6,704	6,446	6,833	6,559	6,965	6,673	7,100	6,789	7,237	6,907	7,377
20. Baan Riverside	7,177	7,536	7,312	7,692	7,448	7,850	7,588	8,012	7,729	8,178	7,864	8,336	8,001	8,497	8,140	8,661	8,282	8,828	8,426	8,999
21. Mahogany	6,966	7,315	7,097	7,466	7,229	7,620	7,365	7,777	7,502	7,937	7,633	8,091	7,766	8,247	7,901	8,406	8,038	8,569	8,178	8,734
22. Bading	6,570	6,898	6,693	7,041	6,818	7,186	6,945	7,334	7,075	7,486	7,198	7,630	7,324	7,778	7,451	7,928	7,581	8,081	7,713	8,237
23. Holy Redeemer	9,702	10,187	9,883	10,397	10,068	10,612	10,256	10,831	10,448	11,054	10,630	11,268	10,815	11,485	11,003	11,707	11,195	11,933	11,389	12,164
24. Imadejas	2,609	2,739	2,657	2,796	2,707	2,853	2,758	2,912	2,809	2,972	2,858	3,030	2,908	3,088	2,959	3,148	3,010	3,209	3,062	3,271
25. Jose P. Rizal	6,723	7,060	6,849	7,205	6,977	7,354	7,108	7,506	7,241	7,661	7,367	7,809	7,495	7,959	7,625	8,113	7,758	8,270	7,893	8,430
26. New Society Vill.	1,977	2,076	2,014	2,119	2,052	2,163	2,090	2,207	2,129	2,253	2,166	2,296	2,204	2,341	2,242	2,386	2,281	2,432	2,321	2,479
27. Bayanihan	6,140	6,447	6,255	6,580	6,372	6,716	6,491	6,854	6,612	6,996	6,727	7,131	6,844	7,269	6,963	7,409	7,085	7,552	7,208	7,698

BARANGAY	2020	with Migrants	2021	with Migrants	2022	with Migrants	2023	with Migrants	2024	with Migrants	2025	with Migrants	2026	with Migrants	2027	with Migrants	2028	with Migrants	2029	with Migrants
Urbanizing																				
1. Agusan Pequeno	6,769	7,107	6,895	7,254	7,024	7,404	7,156	7,556	7,289	7,712	7,416	7,861	7,545	8,013	7,677	8,168	7,810	8,326	7,946	8,486
2. Ambago	16,897	17,741	17,213	18,108	17,534	18,481	17,862	18,863	18,196	19,252	18,513	19,624	18,835	20,003	19,163	20,389	19,496	20,783	19,835	21,184
3. Ampayon	16,982	17,831	17,300	18,199	17,623	18,575	17,953	18,958	18,288	19,349	18,607	19,723	18,930	20,104	19,260	20,492	19,595	20,888	19,936	21,291
4. Baan Km.3	15,097	15,852	15,379	16,179	15,667	16,513	15,960	16,853	16,258	17,201	16,541	17,534	16,829	17,872	17,122	18,218	17,420	18,569	17,723	18,928
5. Bancasi	6,575	6,904	6,698	7,046	6,823	7,192	6,951	7,340	7,081	7,492	7,204	7,636	7,330	7,784	7,457	7,934	7,587	8,088	7,719	8,244
6. Bit-os	4,227	4,438	4,306	4,530	4,386	4,623	4,468	4,719	4,552	4,816	4,631	4,909	4,712	5,004	4,794	5,101	4,877	5,199	4,962	5,299
7. Bonbon	7,271	7,634	7,407	7,792	7,545	7,953	7,686	8,117	7,830	8,284	7,966	8,444	8,105	8,607	8,246	8,774	8,389	8,943	8,535	9,116
8. Doongan	18,328	19,244	18,670	19,641	19,020	20,047	19,375	20,460	19,738	20,882	20,081	21,286	20,430	21,697	20,786	22,116	21,148	22,543	21,516	22,979
9. Libertad	28,975	30,424	29,517	31,052	30,069	31,692	30,631	32,346	31,204	33,014	31,747	33,651	32,299	34,302	32,861	34,964	33,433	35,639	34,015	36,328
10. Lumbocan	5,957	6,255	6,068	6,384	6,182	6,516	6,298	6,650	6,415	6,787	6,527	6,919	6,640	7,052	6,756	7,188	6,874	7,327	6,993	7,469
11. Mahay	5,423	5,694	5,524	5,812	5,628	5,932	5,733	6,054	5,840	6,179	5,942	6,298	6,045	6,420	6,150	6,544	6,257	6,670	6,366	6,799
12. Masao	2,384	2,504	2,429	2,555	2,474	2,608	2,521	2,662	2,568	2,717	2,613	2,769	2,658	2,823	2,704	2,877	2,751	2,933	2,799	2,989
13. Pagatpatan	7,921	8,317	8,069	8,489	8,220	8,664	8,374	8,843	8,530	9,025	8,679	9,199	8,830	9,377	8,983	9,558	9,140	9,743	9,299	9,931
14. Pangabugan	3,511	3,687	3,577	3,763	3,644	3,841	3,712	3,920	3,781	4,001	3,847	4,078	3,914	4,157	3,982	4,237	4,051	4,319	4,122	4,402
15. San Vicente	21,611	22,691	22,015	23,160	22,426	23,637	22,846	24,125	23,273	24,623	23,678	25,099	24,090	25,584	24,509	26,078	24,936	26,581	25,369	27,095
16. Tiniwisan	4,918	5,164	5,010	5,271	5,104	5,380	5,199	5,491	5,297	5,604	5,389	5,712	5,483	5,823	5,578	5,935	5,675	6,050	5,774	6,166
17. Villa Kananga	14,917	15,662	15,196	15,986	15,480	16,316	15,769	16,652	16,064	16,996	16,344	17,324	16,628	17,659	16,917	18,000	17,212	18,348	17,511	18,702

BARANGAY	2020	with Migrants	2021	with Migrants	2022	with Migrants	2023	with Migrants	2024	with Migrants	2025	with Migrants	2026	with Migrants	2027	with Migrants	2028	with Migrants	2029	with Migrants
RURAL																				
1. Amparo	3,980	4,179	4,054	4,265	4,130	4,353	4,207	4,443	4,286	4,535	4,361	4,622	4,436	4,711	4,514	4,802	4,592	4,895	4,672	4,990
2. Anticala	5,159	5,417	5,255	5,528	5,353	5,643	5,454	5,759	5,556	5,878	5,652	5,991	5,751	6,107	5,851	6,225	5,952	6,345	6,056	6,468
3. Antongalon	4,864	5,107	4,955	5,212	5,047	5,320	5,142	5,430	5,238	5,542	5,329	5,649	5,422	5,758	5,516	5,869	5,612	5,982	5,710	6,098
4. Aupagan	2,216	2,327	2,258	2,375	2,300	2,424	2,343	2,474	2,387	2,525	2,428	2,574	2,470	2,624	2,513	2,674	2,557	2,726	2,602	2,779
5. Babag	2,434	2,556	2,479	2,608	2,526	2,662	2,573	2,717	2,621	2,773	2,667	2,827	2,713	2,881	2,760	2,937	2,808	2,994	2,857	3,051
6. Banza	5,654	5,937	5,760	6,059	5,867	6,184	5,977	6,312	6,089	6,442	6,195	6,567	6,303	6,693	6,412	6,823	6,524	6,954	6,637	7,089
7. Baobaoan	1,920	2,016	1,956	2,057	1,992	2,100	2,030	2,143	2,068	2,187	2,103	2,230	2,140	2,273	2,177	2,317	2,215	2,361	2,254	2,407
8. Basag	5,055	5,307	5,149	5,417	5,245	5,529	5,343	5,643	5,443	5,759	5,538	5,870	5,634	5,984	5,732	6,099	5,832	6,217	5,934	6,337
9. Bilay	1,801	1,891	1,835	1,930	1,869	1,970	1,904	2,011	1,940	2,052	1,973	2,092	2,008	2,132	2,043	2,173	2,078	2,215	2,114	2,258
10. Bitan-agan	1,659	1,742	1,691	1,778	1,722	1,815	1,754	1,853	1,787	1,891	1,818	1,927	1,850	1,965	1,882	2,003	1,915	2,041	1,948	2,081
11. Bobon	2,255	2,368	2,297	2,417	2,340	2,466	2,384	2,517	2,428	2,569	2,471	2,619	2,514	2,669	2,557	2,721	2,602	2,774	2,647	2,827

12. Bugsukan	2,096	2,201	2,135	2,246	2,175	2,293	2,216	2,340	2,257	2,388	2,297	2,434	2,337	2,481	2,377	2,529	2,419	2,578	2,461	2,628
13. Cabcabon	3,105	3,261	3,163	3,328	3,223	3,397	3,283	3,467	3,344	3,538	3,402	3,607	3,462	3,676	3,522	3,747	3,583	3,820	3,645	3,893
14. Camayahan	1,680	1,763	1,711	1,800	1,743	1,837	1,776	1,875	1,809	1,914	1,840	1,951	1,872	1,988	1,905	2,027	1,938	2,066	1,972	2,106
15. Dankias	1,595	1,675	1,625	1,710	1,656	1,745	1,687	1,781	1,718	1,818	1,748	1,853	1,778	1,889	1,809	1,925	1,841	1,962	1,873	2,000
16. De Oro	2,627	2,759	2,677	2,816	2,727	2,874	2,778	2,933	2,830	2,994	2,879	3,051	2,929	3,110	2,980	3,171	3,032	3,232	3,084	3,294
17. Don Francisco	1,579	1,658	1,609	1,693	1,639	1,728	1,670	1,763	1,701	1,800	1,730	1,834	1,761	1,870	1,791	1,906	1,822	1,943	1,854	1,980
18. Dulag	2,733	2,870	2,784	2,929	2,836	2,989	2,889	3,051	2,943	3,114	2,994	3,174	3,046	3,235	3,099	3,298	3,153	3,361	3,208	3,426
19. Dumalagan	3,444	3,617	3,509	3,691	3,574	3,768	3,641	3,845	3,709	3,925	3,774	4,000	3,840	4,078	3,906	4,156	3,974	4,237	4,044	4,319
20. Florida	3,347	3,514	3,410	3,587	3,473	3,661	3,538	3,736	3,604	3,814	3,667	3,887	3,731	3,962	3,796	4,039	3,862	4,117	3,929	4,196
21. Kinamlutan	4,135	4,341	4,212	4,431	4,291	4,522	4,371	4,616	4,453	4,711	4,530	4,802	4,609	4,895	4,689	4,989	4,771	5,086	4,854	5,184
22. Lemon	2,498	2,623	2,545	2,677	2,592	2,732	2,641	2,789	2,690	2,846	2,737	2,901	2,784	2,957	2,833	3,014	2,882	3,072	2,932	3,132
23. Los Angeles	6,988	7,337	7,118	7,489	7,251	7,643	7,387	7,801	7,525	7,962	7,656	8,116	7,789	8,272	7,925	8,432	8,063	8,595	8,203	8,761
24. Maguinda	4,806	5,047	4,896	5,151	4,988	5,257	5,081	5,365	5,176	5,476	5,266	5,582	5,358	5,690	5,451	5,800	5,546	5,912	5,642	6,026
25. Maibu	1,992	2,092	2,029	2,135	2,067	2,179	2,106	2,224	2,145	2,270	2,182	2,313	2,220	2,358	2,259	2,404	2,298	2,450	2,338	2,497
26. Mandamo	1,147	1,204	1,168	1,229	1,190	1,254	1,212	1,280	1,235	1,307	1,257	1,332	1,278	1,358	1,301	1,384	1,323	1,411	1,346	1,438
27. Manila de Bugabus	5,053	5,306	5,148	5,415	5,244	5,527	5,342	5,641	5,442	5,758	5,537	5,869	5,633	5,982	5,731	6,098	5,831	6,216	5,932	6,336
28. Manuel J. Santos	1,892	1,986	1,927	2,027	1,963	2,069	2,000	2,112	2,037	2,155	2,073	2,197	2,109	2,240	2,146	2,283	2,183	2,327	2,221	2,372
29. Maug	3,709	3,894	3,778	3,975	3,849	4,057	3,921	4,140	3,994	4,226	4,064	4,307	4,134	4,391	4,206	4,475	4,279	4,562	4,354	4,650
30. Nong-nong	2,128	2,234	2,168	2,281	2,208	2,328	2,250	2,376	2,292	2,425	2,332	2,472	2,372	2,519	2,414	2,568	2,456	2,618	2,498	2,668
31. Pianing	2,890	3,035	2,944	3,098	3,000	3,161	3,056	3,227	3,113	3,293	3,167	3,357	3,222	3,422	3,278	3,488	3,335	3,555	3,393	3,624
32. Pigdaulan	3,376	3,545	3,440	3,618	3,504	3,693	3,569	3,769	3,636	3,847	3,699	3,921	3,764	3,997	3,829	4,074	3,896	4,153	3,964	4,233
33. Pinamanculan	4,085	4,290	4,162	4,378	4,240	4,468	4,319	4,561	4,400	4,655	4,476	4,745	4,554	4,836	4,633	4,930	4,714	5,025	4,796	5,122
34. Salvacion	2,109	2,215	2,149	2,261	2,189	2,307	2,230	2,355	2,272	2,403	2,311	2,450	2,351	2,497	2,392	2,545	2,434	2,595	2,476	2,645
35. San Mateo	3,776	3,964	3,846	4,046	3,918	4,130	3,991	4,215	4,066	4,302	4,137	4,385	4,209	4,470	4,282	4,556	4,356	4,644	4,432	4,734
36. Santo Nino	3,549	3,726	3,615	3,803	3,683	3,881	3,751	3,961	3,822	4,043	3,888	4,121	3,956	4,201	4,025	4,282	4,095	4,365	4,166	4,449
37. Sumile	2,786	2,926	2,838	2,986	2,891	3,048	2,946	3,110	3,001	3,175	3,053	3,236	3,106	3,299	3,160	3,362	3,215	3,427	3,271	3,493
38. Sumilihon	6,661	6,994	6,785	7,138	6,912	7,285	7,041	7,436	7,173	7,589	7,298	7,736	7,425	7,885	7,554	8,037	7,685	8,193	7,819	8,351
39. Tagabaca	4,655	4,888	4,742	4,989	4,831	5,092	4,921	5,197	5,013	5,304	5,101	5,407	5,189	5,511	5,280	5,618	5,372	5,726	5,465	5,837
40. Taguibo	5,658	5,941	5,764	6,064	5,872	6,189	5,981	6,316	6,093	6,447	6,199	6,571	6,307	6,698	6,417	6,828	6,529	6,959	6,642	7,094
41. Taligaman	5,474	5,747	5,576	5,866	5,680	5,987	5,787	6,111	5,895	6,237	5,997	6,357	6,102	6,480	6,208	6,605	6,316	6,733	6,426	6,863
42. Tungao	7,613	7,993	7,755	8,158	7,900	8,326	8,048	8,498	8,198	8,674	8,341	8,841	8,486	9,012	8,634	9,186	8,784	9,363	8,937	9,544

Socio-Cultural Features. Major dialects used and spoken within Butuan City are Cebuano, Butuanon and Manobo. The major religion of the city is Roman Catholic with 254,685 or 83% of the household population. This is followed by Evangelical Church with 14,035 or 5%, Iglesia ni Cristo with 8,662 or 1.24% and the remaining 10.76% belong to other religious affiliation like the Seventh –day Adventist 1.44%, Aglipayan 1.25%, United Church of Christ in the Philippines 1.17% and many more.

Table 13. Religious composition of Butuan City.

RELIGIOUS AFFILIATION	BOTH SEXES	MALE	FEMALE
TOTAL	**337,063**	**170,885**	**166,178**
Aglipay	47	22	25
Asso. of Baptist Churches in Luz., Vis., and Min.	2	1	1
Asso. of Fundamental Baptist Churches in the Phil.	112	58	54
Bible Baptist Church	3,230	1,550	1,680
Bread of Life Ministries	84	38	46
Buddhist	34	24	10
Church of Christ	720	357	363
Church of Jesus Christ of the Latter Day Saints	1,284	642	642
Evangelical Christian Outreach Foundation	55	28	27
Evangelicals (Phil. Council of Evangelical Churches)	9,580	4,699	4,881
Faith Tabernacle Church (Living Rock Ministries)	48	26	22
Iglesia ni Cristo	10,007	5,049	4,958
Iglesia sa Dios Espiritu Santo, Incorporated	89	43	46
International One Way Outreach	3	1	2
Islam	3,688	1,897	1,791
Jehovah's Witness	2,214	1,048	1,166
Jesus is Alive Community, Incorporated	10	6	4
Jesus is Lord Church	1,714	834	880
Lutheran Church of the Philippines	15	5	10
Miracle Revival Church of the Philippines	8	5	3
Missionary Baptist Churches of the Philippines	148	77	71
National Council of Churches in the Philippines	6,851	3,545	3,306
Philippine Benevolent Missionaries Association	19	14	5
Philippine Ecumenical Christian Church	1,508	803	705
Philippine Good News Ministries	7	4	3
Philippine Grace Gospel	67	35	32
Philippine Independent Catholic Church	511	249	262
Potter's House Christian Center	17	12	5
Roman Catholic, including Catholic Charismatic	265,787	135,469	130,318
Salvation Army, Philippines	42	19	23
Seventh Day Adventist	6,143	3,024	3,119
Union Espiritista Cristiana de Filipinas, Incorporated	76	36	40
United Church of Christ in the Philippines	3,350	1,614	1,736
United Pentecostal Church (Philippines), Incorporated	2,709	1,334	1,375
Victory Chapel Christian Fellowship	51	22	29
Way of Salvation Church, Incorporated	4	1	3
Other Baptists	1,163	554	609
Other Protestants	2,320	1,131	1,189
Other Religious Affiliations	13,318	6,600	6,718
Tribal Religions	25	8	17
None	3	1	2

Source: Philippine Statistics Office-XIII / City Planning & Dev't. Office, Butuan City

There are 122 preschools/kindergarten schools/, 135 (30 private) elementary schools and 62 (24 private) secondary schools within the City. In addition, there are 21 colleges/universities, 17 skills/vocational schools and 15 non-formal schools in Butuan City. The table below show the literacy rate of the citizens in the city.

Table 14. Literacy rate in Butuan City

Age Group & Sex	Total Population 10 Years old & above	Literate	Illiterate
Both Sexes	**233,365**	**224,620**	**8,745**
"10-14	40,873	38,439	2,434
15-19	33,751	32,880	871
20-24	27,173	26,637	536
25-29	23,469	23,073	396
30-34	21,994	21,505	489
35-39	19,997	19,523	474
40-44	16,858	16,495	363
45-49	13,529	13,115	414
50-54	10,597	10,222	375
55-59	7,867	7,437	430
60-64	6,912	6,281	631
65-69	4,417	4,045	372
70 and over	5,927	4,968	960

Source: Philippine Statistics Office-XIII / City Planning & Dev't. Office, Butuan City
Computed based on 2010 NSO census count

2.3 Economic Profile and Land Use

Economic Profile. Butuan became a City by virtue of R.A. 523 otherwise known as the “City Charter of Butuan Act, converting the status of Butuan from a municipality into a City on August 2, 1950. Butuan was reclassified as a highly-urbanized city (HUC) in February 7, 1985, by virtue of Memorandum Circular No. 83 – 49 of the Ministry of Local Government.

Agricultural Crops Production. Total potential area for agricultural crop production as of year 2016 in the City of Butuan is 59,524.95 hectares. From these areas, only 32.3% or 19,210.3 hectares were planted to various crops.

Its main agricultural products are rice, corn, coconut and banana. New crops planted by farmers are agro-industrial crops like rubber and palm oil. However, farmers acceptance to the latter somewhat diminished due to the governments drive for multiple cropping in which palm oil crops is best suited for mono cropping. Other crops gaining acceptance are mango, cacao and coffee production.

Average production for rice is 3.52 metric tons or 70.4 cavans for irrigated cultivation and 2.36 metric tons or 47.2 cavans for rainfed production. Corn average production is 2.09 metric tons for white OPV, 6.46 metric tons for yellow corn and for the native variety, 1.53 metric tons. Coconut averaged 6.38 metric tons and banana production totalled to 13,061.28 metric tons (Ecological Profile 2019).

Livestock and Poultry. Livestock and poultry production in the city are generally backyard in scale. For commercial production, egg production (broiler and layer) are the more pronounced one with 156,027 heads and 301,550 heads respectively. Meanwhile, hog commercial population declined by 27% from year 2011 to 2016. The same is true to backyard hog population which dropped from 22,707 heads to 19,282 heads during 2011 to 2016 (Ecological Profile 2019).

For year 2016, poultry (chicken) is mainly produced in the city by 6,592,518.57 kilos from 4,559,784 heads. Porcine (hog) production on the other hand reached to 2,224,560 kilos from 34,224 heads. With the increasing city population (337,063 census as of 2015), meeting the rising demand for livestock and poultry needs is supplied by the filled out by the neighboring cities and provinces. Most if not all of the livestock population in the city are raised in the rural barangays. Barangay with the highest swine population is barangay San Vicente, followed by Barangay Amparo (Ecological Profile 2019).

For chicken population, in a backyard scale; the highest is barangay Bancasi followed by barangay Manila de Bugabus. For broiler (chicken meat) production, the highest is barangay Cabcabon followed by Barangay Antongalon (Ecological Profile 2016).

Fish Production. A total of 650 fishermen are listed in the city. They have 85 motorized bancas and 200 non-motorized as their main device in their fishing operation. Estimated production is 3 kilos per fisherman per day. For Aqua production, a total of thirty (30) fishing nets is operational in the city. Added to these, are the 103 fish cages.

To preserve and sustain fish production, a number of projects were launched. One of these is the artificial reef project. A total of 57.5 hectares of identified fish sanctuary were preserved and protected. A total of 35,000 trees were planted in the identified mangrove areas as part of the Mangrove Development Project (Ecological Profile 2019).

Existing Fishponds. Most of the existing fishpond (Brackish Water) in the city for the year 2016 is located in seven (7) rural barangays namely; Ambago, Babag, Libertad, Lumbocan, Masao, Pagatpatan and Pinamanculan. Their main produce is bangus. They also produce tilapia, shrimp and prawn as by-product. Consequently, the largest area cultivated for brackish water fishpond production is in barangay Masao with an area of 517.13 hectares with an estimated production of 560 metric tons of bangus. This is followed by barangay Ambago yielding 250 metric tons in a total fishpond area of 276 hectares. Barangay Lumbocan has a lower cultivated fishpond area of 156.48 hectares, but yielded a much bigger produce of 300.6 metric tons compared to barangay Ambago (Ecological Profile 2019).

Fresh water fishponds in the city are located in 22 barangays with a total area of 32.5 hectares yielding 10.47 metric tons of tilapia operated by 50 farmers. The highest producing barangay is barangay Libertad with 3.7 metric tons of 0.75 hectares, followed by barangay Nongnong with 0.80 metric tons in a total area of four hectares (Ecological Profile 2019).

List of Rice and Corn Mills. A total of 33 rice mills operate in the city to serve rice producing barangays. Majority of them used the compact type machine (20); improvised conventional machine (6); conventional (5); kiskisan (1) and modern machines (2) which are located in barangay Taguibo and Taligaman. In addition, all five corn producing barangays have mills. Majority of which are using the roller type machine (3) and grinder type machine (2) (Ecological Profile 2019).

Number and Type of Farm Implements. A total of 14,476 farmers used various farm implements and tools in their agricultural production activities. These are hand tractors (539), four-wheeled tractors (15) and power tillers (24). A number of irrigation system were installed for agricultural production purposes. Shallow Tube Wells (89) were used, Pump Irrigation System for Open Source (81), Diversion Dam (1), Small Water Impounding Project (8) and Community Irrigation System (32) were provided. For milling activities, a total of 86 rice mills, 22 corn mills, and one coffee mill operate in the city (Ecological Profile 2016).

Production and Disposition of Wood-Based Products. A total of 20 wood-based industries operate in the city. The wood species being processed were Falcata, Gmelina, Mangium, Bagras, Mahogany and etc. In addition, there is an increase in terms of lumber disposition from 13,256.55 cubic meters in 2014 to 34,630.56 cubic meters in 2015 and 34,895.66 cubic meters in 2016 (Ecological Profile 2016).

Plywood, Blockboard and Veneer Production. The total of log input reached 78.031 cubic meters with sales volume of 51,619 cubic meters. Likewise, the total veneer input was 94,420 cubic meters having a sales volume of 74,621 cubic meters. Meanwhile, domestic sales of blockboard production increased from 16,893.89 cubic meters in 2008 to 38,261.15 cubic meters (Ecological Profile 2016).

In the last seven years, log input in veneer production declined. Logs being processed into plywood/blockboard had a total volume of 74,621.03 cubic meters with a total disposition volume of 1,177.20. (Ecological Profile 2019).

Business Establishment.A total of 9,707 business establishment were registered in Butuan City. With a percentage distribution by major types, these businesses are classified as trading (60.46%), services (32.79%), manufacturing (5.45%), agri-business (1.21%); mining and quarrying (.09%) (Ecological Profile 2019).

In the last seven years, the business activity in the city has fluctuated (8.78%). The drop was due to non-renewal of existing business permits. However, capitalization grew amounting to Php38,285,800,217.56 with total Annual Sales of Php109, 812, 345,008 .89 (Ecological Profile 2016).

It was noted in the illustration below that the business industries scale of capitalization in 2016 was dominated by micro industry (76.51%) with capitalization of at least 150,000 and below, followed by cottage industry (18.79%) with capitalization of above 150,000-1.5 Million, small scale (4.19%) with capitalization of above 1.5 million to 15 million, medium scale (0.26%) with capitalization of above 15 million to 60 million and the large scale (0.24% with capitalization of over 60 million.

Figure 1 and Figure 2 respectively shows the classifications of major establishments with corresponding scale of capitalization.

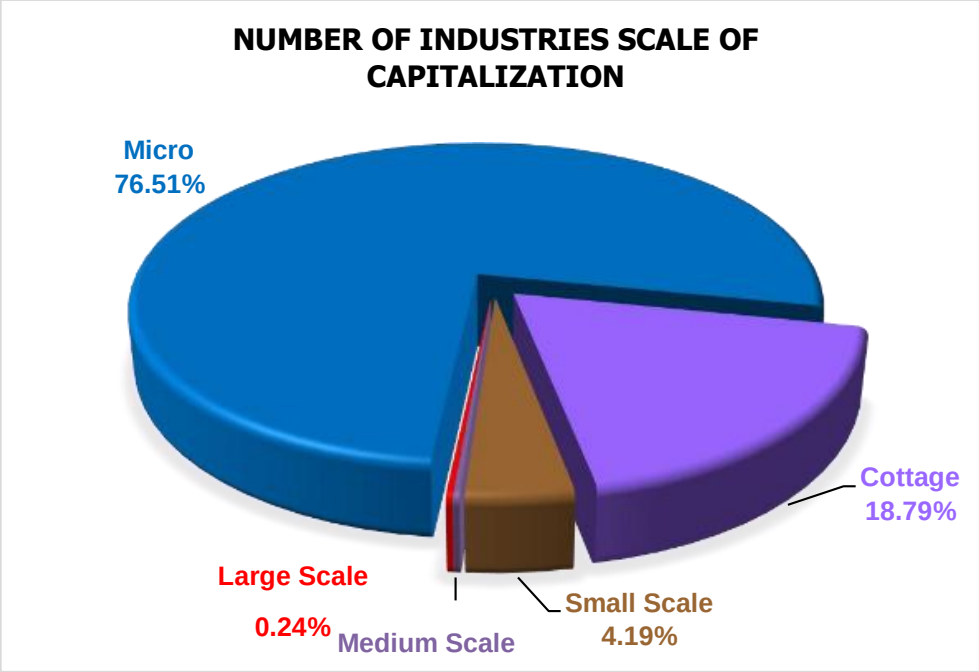

Figure 1.Business establishment in Butuan City.

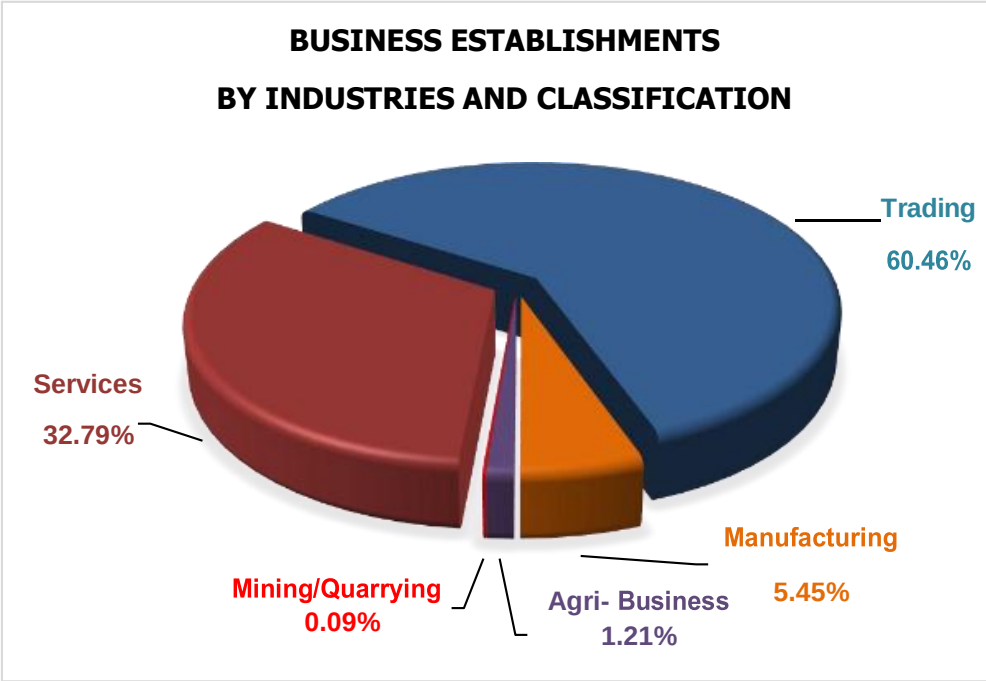

Figure 2.Capitalization of industries in Butuan City.

Building Permits and Issuances. There is an increase in terms of building permit issuances in the city as a result of economic development. Permits issued to residential (762). In addition, indigenous residential permit also increased (71%) while non-residential permits displayed higher issuances (153) (Ecological Profile 2016).

Tourism. The catch phrase "The Prehistoric Destination" was adapted by the City of Butuan to position the city in the international map of tourism. Ancient artifacts dating to the early Sung Yuan and Ming Dynasty and the discovery of nine (9) balangays or "The Butuan Boat" which dated 320 A.D. are just few of the historical attraction which popularly earned the city as "The home of the Balangays", a famous pre-historic native boat in the Southeast Asia.

Moreover, the city Government envisions Butuan to be the **Show Window of History and Culture and Meetings, Incentives, Conventions, Exhibitions (MICE)** destination in Mindanao. This will professionalize the tourism services and development of local products of the city by making it as one of the priority programs by the local government unit. Activities relative to tourism are listed below:

1. **Kahimunan Festival** is every 3rd Sunday of January in Barangay Libertad. An annual festivity to pay homage to patron Saint, Sr. Sto. Nino. It is a mixture of Christian commemoration and folk elements celebrated with pomp and pageantry.
2. **Formal & Official Hoisting of the Philippine Flag in Mindanao** which took in place on January 17, 1899 during the final days of the Philippine Revolution. Four flags were flown in Mindanao celebrating freedom. Butuan chose to raise the Philippine flag with a formal band playing, a unique and dramatic historical event ever witnessed by the officials andresidents.
3. **First Mass Anniversary or Mazaua Discovery Day** a re-enactment of Magellan's landing and planting of the cross on March 31, 1521 in Masao, Butuan City. It signifies the First Easter Mass Celebration in the Philippines. A day commemorating the mass offered by FerdinandMagellan.
4. **Balangay Festival** is celebrated every year during the month of May, which highlights the Balangay theatre float parade/Mutya Hong Butuan Beauty Search andhomecomings.
5. **Abayan Festival** celebration falls every last Sunday of July which connotes a deeperandcolourfulmeaningtotherealButuanons.Itisaday-longfestivityobaroto race, fluvial procession, with songs and chants to drive away the crocodiles that once inhabited thearea.
6. Upon the arrival of the Spaniards they introduce the practice of honoring Saint Anne, the patron saint of water and good voyage to blend in to the catholic ancient tradition.
7. **Adlaw Hong Butuan** is a charter day celebration of Butuan commemorating life and culture of thecity.
8. **Light-Up Butuan for Christmas** is a city tradition of lighting up the Guingona

Park and the city's major thoroughfares signalling the month-long celebration of the messiah's birth. The city enjoys thematic and colorful myriad of Christmas lights and fireworks display.

Land Use. The total land area of Butuan City is 817km^2 with a maximum North-South dimension of approximately 35km. The total urbanized land area is 2,333 (2.85 % of the City's land area). Within the urban classification, 13.54 % are utilized as residential areas, 15.77 % as prime agricultural lands and 10.93 % as vacant lots. Waterways make up the 42.86 % of the urban areas, while the industrial, commercial and institutional sectors make up 6.47 %. Meanwhile, land use classification for the rural areas are comprised of agriculture (48.28%) and forestland (1.28 %). Aquaculture areas (fishponds) were prominent in some barangays. Table 15 and Figure 3 show the various land uses in Butuan City.

Table 15. Land Uses of Butuan City, 2015.

LAND USE	URBAN		RURAL		TOTAL	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
Built-up Areas						
Residential	316	13.6	800	1.0	1, 116	1.4
Institutional	30	1.3	385	0.5	415	0.5
Commercial	42	1.8	195	0.2	237	0.3
Industrial	25	1.1	145	0	170	0.2
Roads	54	2.3	32	0	86	0.1
Forested Area/Parks	0	0	0	0	0	0
Agricultural	368	15.8	38, 331	48.3	38, 699	47.4
Fishpond	0	0	1, 024	1.3	1, 024	1.3
River/Waterways	1, 000	42.9	1, 934	2.4	2, 934	3.6
River wash	0	0	817	1.0	817	1.0
Grassland/Pastureland	0	0	6, 115	7.7	6, 115	7.5
Forestland	0	0	26, 866	33.8	26, 866	32.9
Vacant lots	255	10.9	0	0	255	0.3
Other uses	243	10.4	2, 751	3.5	2994	3.7
TOTAL	2, 333	100	79, 395	100	81, 728	100

Source: Socio-Economic and Development Profile, 2015

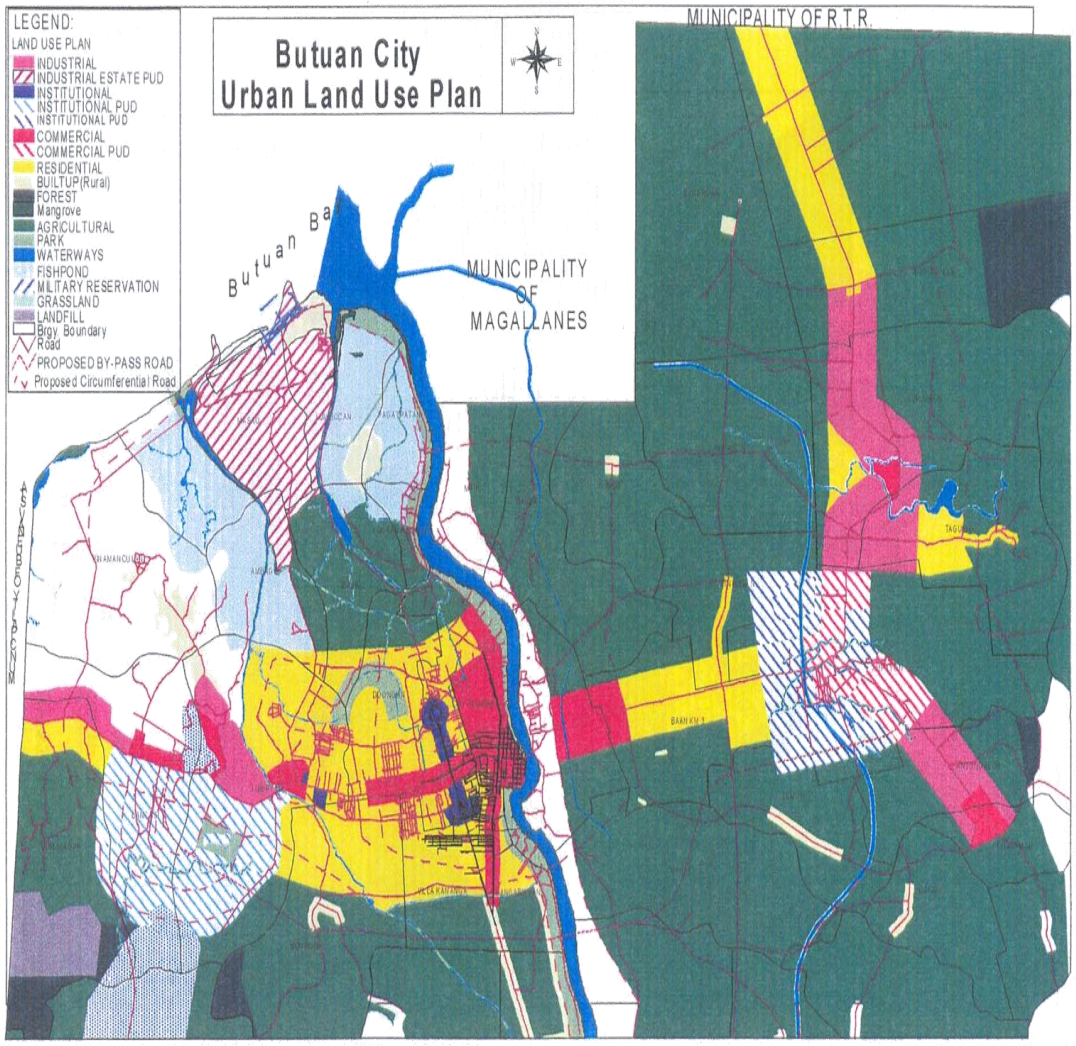

Figure 3. Butuan City Urban Land Use Plan

Butuan City is primarily an agricultural city surrounded by natural forests and forested areas. The city's major agricultural commodities are rice, corn, cash crops and wood. Fishing and aquaculture are also the major livelihoods within the city. In addition, Butuan City being classified as a HUC is dependent on its Internal Revenue Allotment (IRA) coming from the national government. The city's revenues emanate from (1) water and energy fees; (2) market and slaughter fees; (3) real property taxes; (4) commercial and agro-industrial establishments; (5) vehicular and traffic fees; etc.

Butuan City's is currently experiencing rapid and inclusive growth. Tourism activities in the coastal and upland areas suggest for the development of a comprehensive Ecotourism Management Plan, updating of the city's Comprehensive Land Use Plan (CLUP) and, the establishment of management zones in the watershed areas. The city's economy is growing as manifested by the increasing number of commercial and agro-industrial establishments within the city. In addition, small-medium enterprises (SMEs) were also increasing. The population of the City is also projected to increase due to the influx of people from neighboring municipalities and cities. These socio-economic activities have led to an increase on the generation of excess materials and wastes that degrades public health and ecological stability of the city.

In the next 10 years, it is projected that the economic activities in the city as well its population will further increase. Urban expansion, creation of economic hubs, I.T. Centers, new transport terminals and ports, ecotourism sites, recreational centers, and the expansion of the Bancasi Airport were all included in the 10-year Executive Legislative Agenda of Butuan City.

Land Classification. Butuan City has a total area of about 81,728 hectares. Of these, 43.45% or 35, 513 hectares are alienable and disposable lands with the remaining areas classified as forestlands. The land classification status and corresponding map are presented in Table 16 and Figure 4 respectively.

Table 16. Land classification status of Butuan City.

LAND CLASSIFICATION	AREA (HA)	PERCENTAGE
1. Alienable & Disposal	35, 513	43.45 %
2. Forestland/Timberland	46, 215	56.55 %
TOTAL	**81, 728**	**100 %**

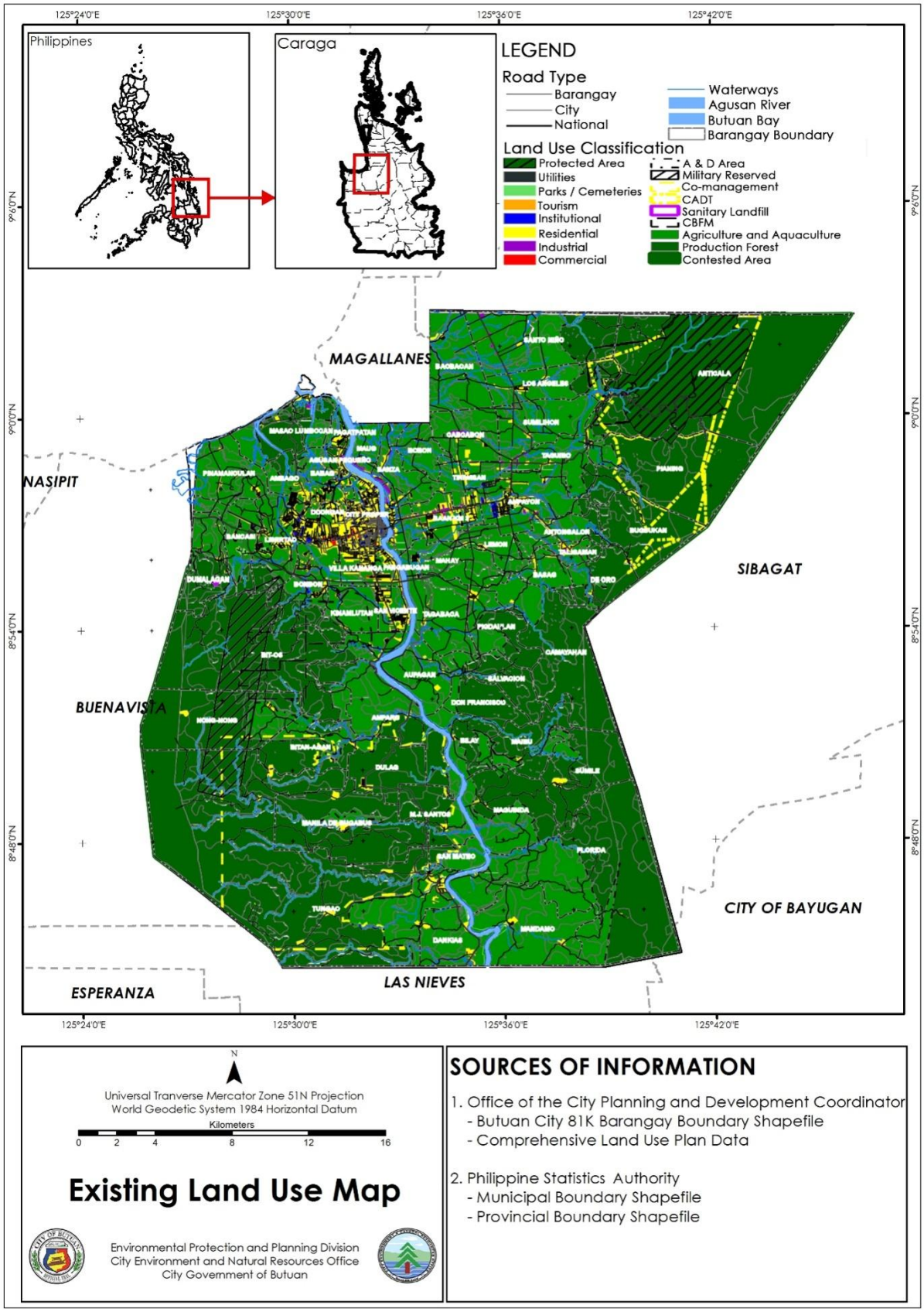

Figure 4. Existing Land Use Map of Butuan City.

Land Use and Vegetative Cover.A study of the land use pattern of Butuan revealed that the city is still primarily a rural locality. A large chunk of the total land area of the city, about 52.08% is utilized for agricultural purposes. The area categorized theforest purposes is about 26,800 hectares or 32.79% of the city's land area. On the other hand, the built-up or urban area consists only of about 3,232.63 hectares or 3.96% of the entire city. The area coverage of each general land use is shown in Table 17 the existing land use map of Butuan City is presented in Figure 5.

Table 17. Vegetative cover distribution of Butuan City.

VEGETATIVE COVER	**AREA** (has)	**PERCENTAGE** (%)
Alienable and Disposable	35,513	43.45
Cultivated Perennial Crop	559	0.68
Open forest Broadleaves	2,902	3.55
Cultivated Annual Crop	2,720	3.33
Mangrove	85	0.10
Natural Grassland	9,567	11.71
Wooded land/Grassland	8,023	9.82
Wooded land/Shrub	21,673	26.52
Inland water	43	0.05
Fishpond	595	0.73
Lumbocan Islet	48	0.06
TOTAL	**81,728**	**100**

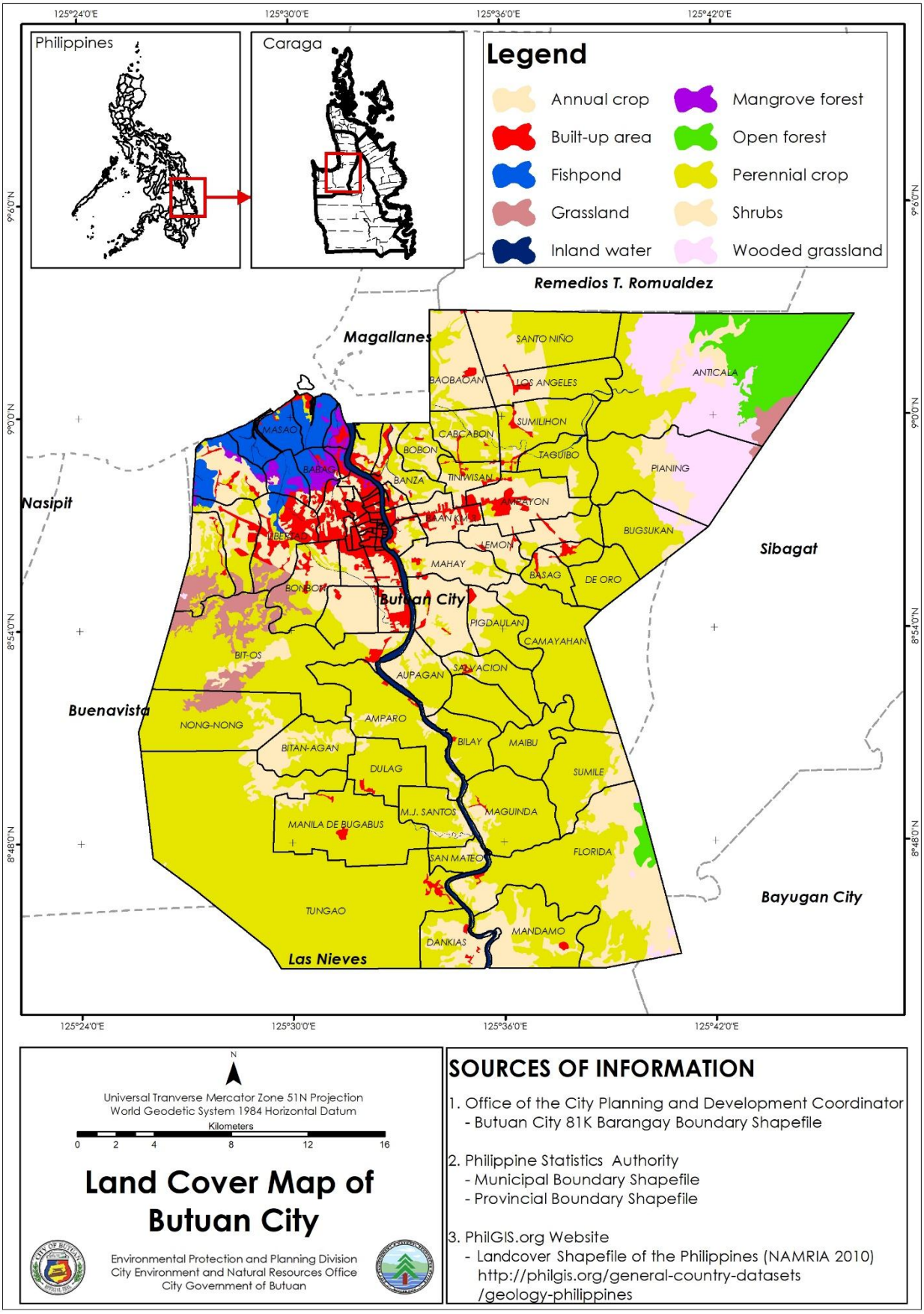

Figure 5. Land Cover Map of Butuan City.

Mineral Resources. A review of the Bureau of Mines and Geo-Sciences 1994 Philippine Metallic and Non-Metallic Reserves disclosed the presence of manganese reserve in the province of Agusan del Norte especially in San Antonio, Remedios Trinidad Romualdez (RTR). Other than said reserve, the record of said Bureau shows no other mineral reserves, whether positive, probable or possible, within and around the City of Butuan.

Location and Size of Surface Freshwater Resources. Surface freshwater is an abundant resource in Butuan as evidenced by the presence of numerous rivers and creeks. Based on the BSWM study there are seventeen (17) major water ways draining into Butuan, the most prominent of which is the Agusan River. The other river channel includes the Ampayon River, Mahay River, Tagabaca River, Agusan Pequeño River, Mantange River, Masao River, Manapa River, Taguibo River, Ambago River, Bitan-agan River, Bilay River, Masago River, Mambatua River, Subait River and Bugabus River. The surface water system/hydrologic map of Butuan is shown in Figure 6.

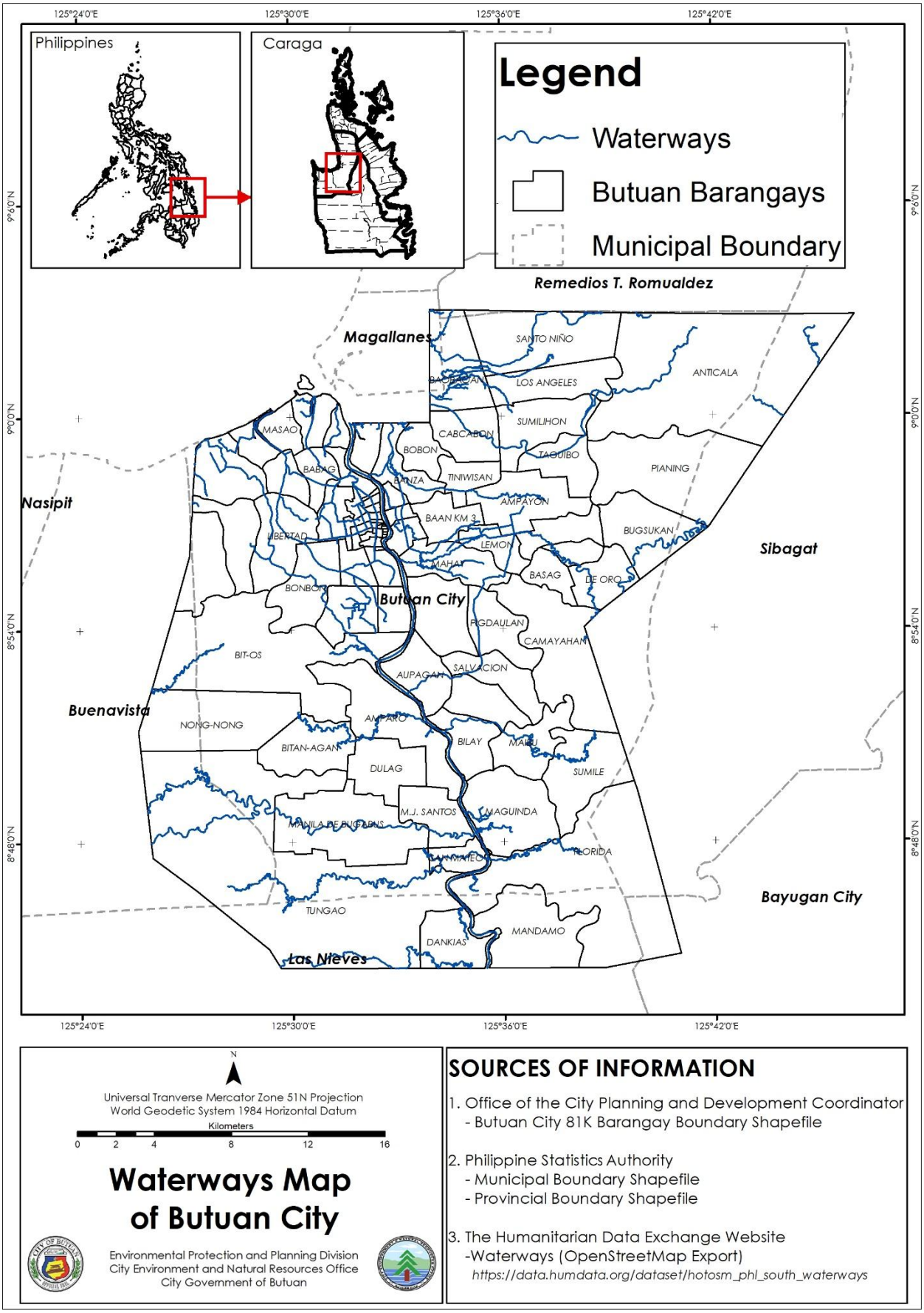

Figure 6. Waterways map of Butuan City

The rivers and streams currently are being used for irrigation and domestic uses. The continuous siltation and sedimentation of said channels brought about by the degradation of watersheds however threaten their viability to provide suitable water for said purposes. Potable drinking water meanwhile is source from pump wells of the local water district (BCWD) for the built-up areas.

Groundwater Resources. Studies of BCWM likewise revealed ample volume of groundwater resources in the area as manifested by the presence of artesian wells, box springs, and free flowing wells. The 1984 study of BCWM disclosed a considerable number of wells, around 85, all around the City.

Transportation Routes and Traffic Conditions. Almost all of the roads covering the barangay serviced areas are concrete paved roads specially those within the urban centers. However, roads within the central business district (CBD) are mostly congested because it consists of only two lanes. Garbage collection at the CBD is therefore scheduled or conducted early morning (first shift) and in the evening (third shift) to avoid traffic congestion. Garbage collection and disposal activities of the second shifting are confined in the rural barangays where traffic congestion is not a problem. See Figure 7 for the location of major routes in the city.

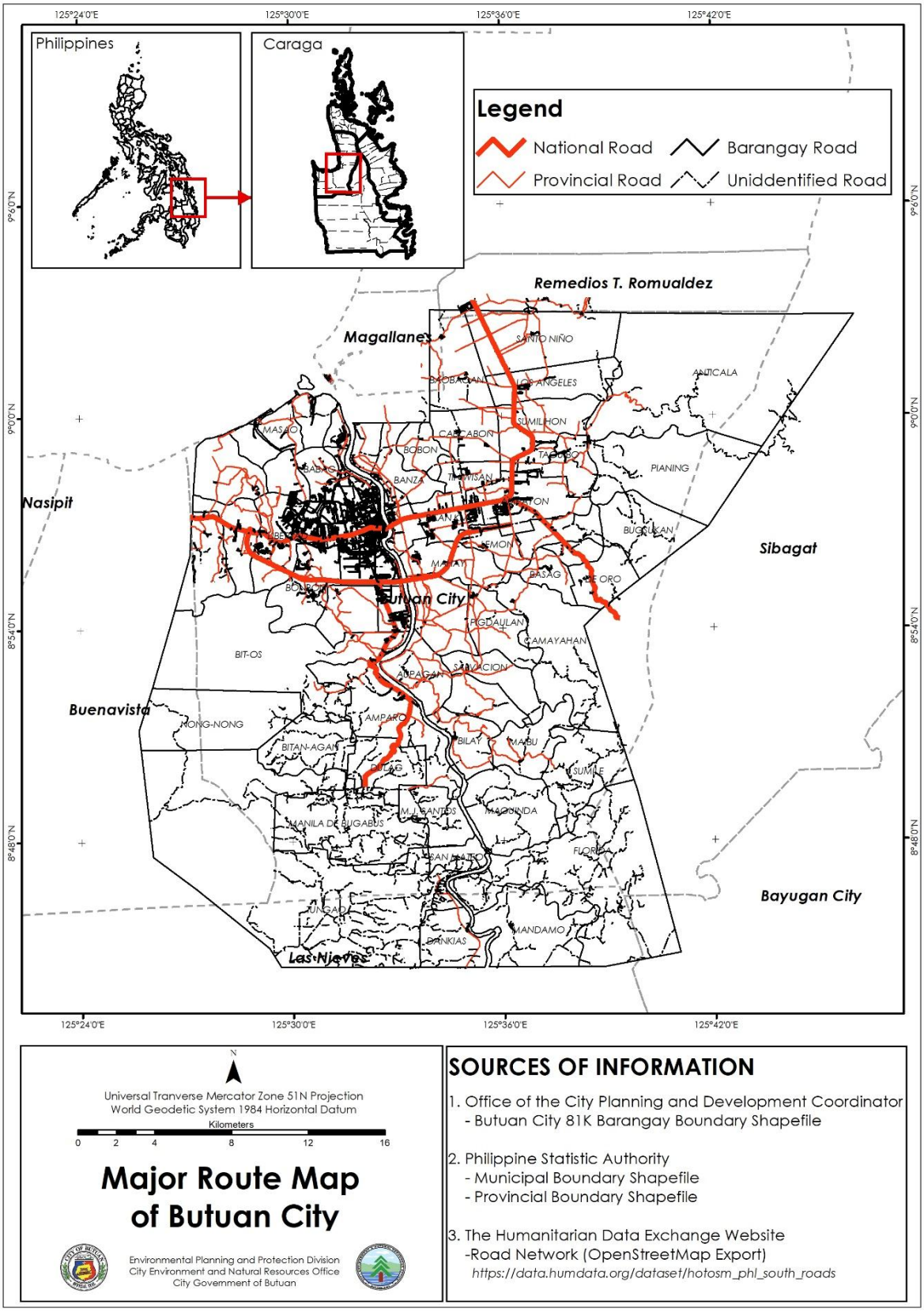

Figure 7. Major Route Map in Butuan City

Table 18. Traffic conditions and recommendation.

CONDITIONS	REMARKS & RECOMMENDATIONS
During rush hour, A.D. Curato St., experience traffic congestion especially near Guigona Park, BCES and ANHS	Disallow traffic vendors, strict implementation of proper parking area, alternate route
Light traffic flow can be observed in Baan Highway going to Ampayon however, at Magsaysay Bridge there can be seen heavy traffic especially during rush hour.	Strict implementation of traffic policy especially the proper loading/unloading of AC passengers, creation of another bridge intended for tricycles and light vehicles
Langihan Market has moderate to heavy traffic especially during rush hour and weekends where a lot of vehicles park outside the market.	Proper terminal for motorized tricycle as well as proper parking. For trisikad, they should have end points
Montilla Blvd (South and North) has light traffic flow except one certain point (corner P. Burgos, intersecting) where street vendors are rampant.	Disallow traffic vendors, strict implementation of proper parking area, alternate route, implement Jay Walking and promotion of using overpass
J. Rosales Avenue (Gaisano Mall) area has moderate traffic especially during rush hour and Tricycle stand-by outside the mall.	Strict implementation of traffic policy especially the proper loading/unloading of tricycle passengers, there should have proper pedestrian lane
Light traffic flow can be observed in J.C. Aquino Avenue going to Libertad-Bancasi except Philcom area and PNP Camp	Strict implementation of traffic policy especially the proper loading/unloading of AC passengers, implement Jay Walking and promotion of using overpass

Source: Butuan City LTTMO

In terms of health, Figure 8 below shows the geographic locations of public/private hospitals, health center/stations and birthing clinic.

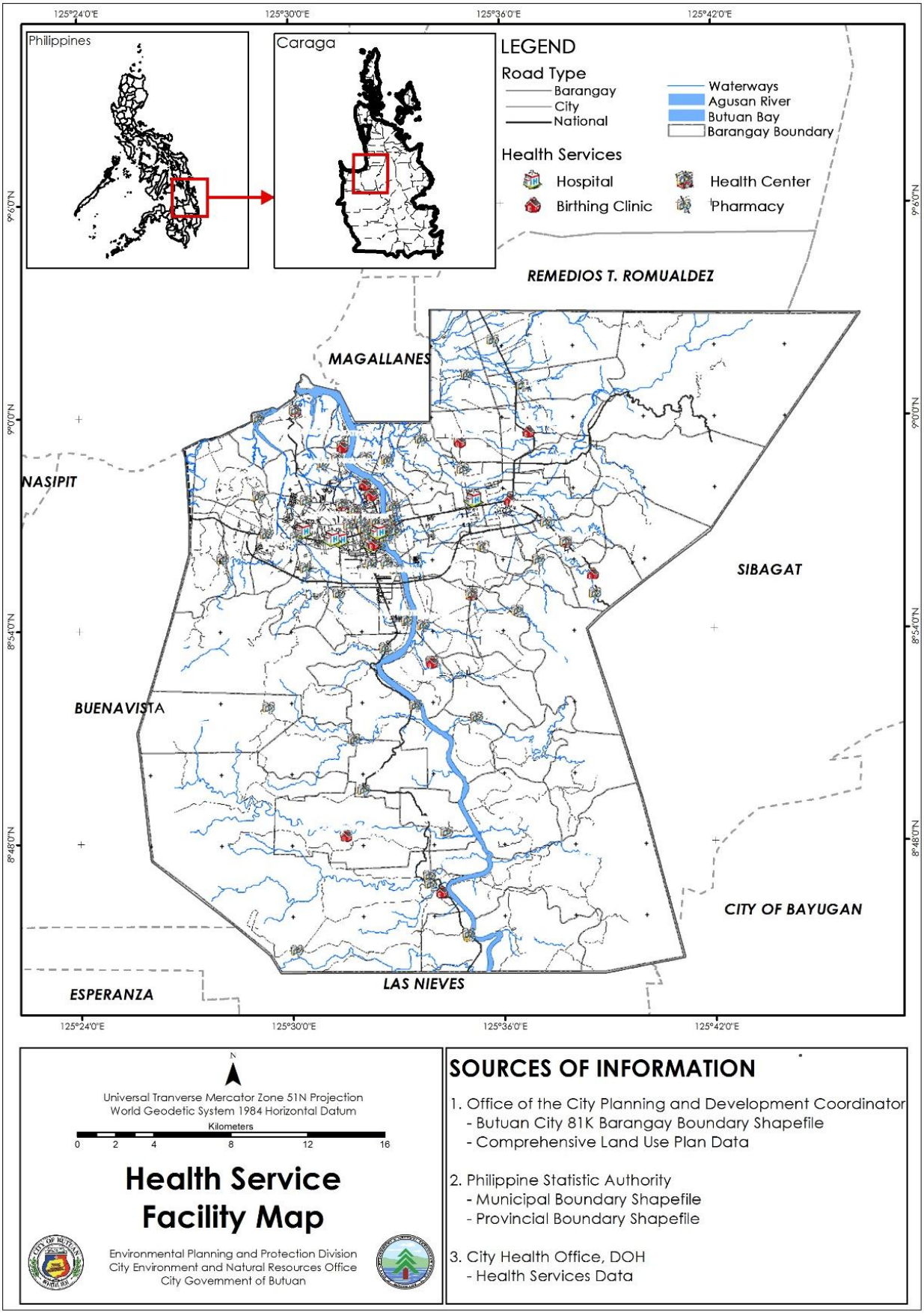

Figure 8. Location of Medical and Health facility within Butuan City

2.4 Physical Characteristics

Geography. Butuan City is located in the central portion of the province of Agusan del Norte in Northern Mindanao. It served as the regional center of Caraga Administrative Region or Region 13. It lies at 8044' and 9003' latitude, and 125026' and 125043' longitude. It is bounded on the north by the Butuan bay, on the east by the Municipality of Sibagat, on the west by Municipality of Buenavista and on the south by municipality of Las Nieves. Figure 9 shows the base map of Butuan City indicating the location and administrative boundaries of the city.

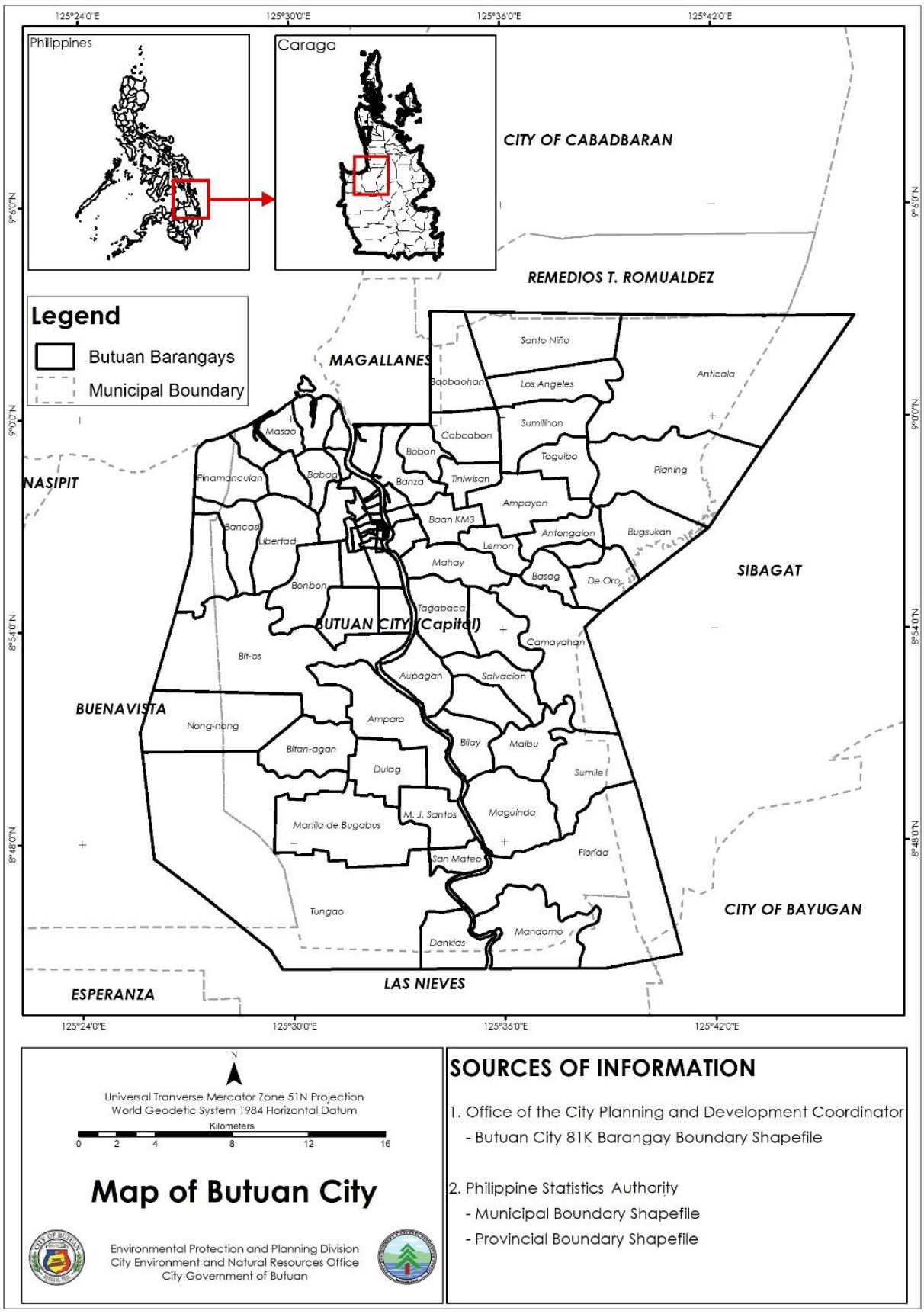

Figure 9. Map of Butuan showing its administrative location and boundaries.

Geology and Geomorphology. The City of Butuan is made up of a wide coastal plain connecting the Las Nieves-Bayugan-San Luis alluvial plain which is part of the Agusan-Davao trough. A mountain range straddles in the southeast boundary with the 675-meter-high Mount Mayapay dominating the area. To the east of the area is the Agusan River which flows northward into the Butuan Bay. Said river is the biggest in Agusan and is one of the seven major rivers in the country. The river moderately deep and is navigable by small water vessels reaching as far as Agusan del Sur. The river is winding with ox-bow lakes at some points along its channel. Agusan valley is constricted at Barangay Amparo at the southern part of Butuan. There are flood plains downstream with extensive marsh delta lining up and adjacent to the mouth of the river.

The Bureau of Soils and Water Management study of the area reveal eight geological formations in Butuan. The oldest rock formation belongs to metamorphic rocks. It constitutes the basement complex unit found on a small host structure in between the boundaries of Magallanes and Butuan City. On the other hand, ultra-basic rocks made up of peridotite and gabbo rocks manifest in the Mount Mayapay and surrounding vicinities. In the northeastern portion of Butuan, Bislig volcanic rocks emerge in close contact with extensive Taguibo Limestone. The most extensive geological formation in Butuan is that of sedimentary rock. This rock formation includes classic materials of sandstone and extensive quaternary alluvium which occur on valley floors, coastal and littoral zones including the mangrove/swampy areas. The four types of sedimentary rocks present in the area are: sandstone, siltstone and shale; nestone formation; clay and conglomerate formation; and alluvium which dominated a large part of the area especially the western and eastern sections of the city.

The City of Butuan also lies above a fault zone. One of the major faults found in the area is an extension of the Philippine Master Fault which trends on a southeasterly direction from the Dingalan Bay in Northern Luzon passing through the Bondoc Peninsula, Camarines to Masbate, through Leyte, Surigao, Agusan and ends in the Davao Gulf. This fault runs parallel of Agusan River north of Butuan following the river's upstream route southward to Agusan del Sur. Other minor faults trend northeast and northwest and are generally perpendicular to the master fault. (See Figure 10).

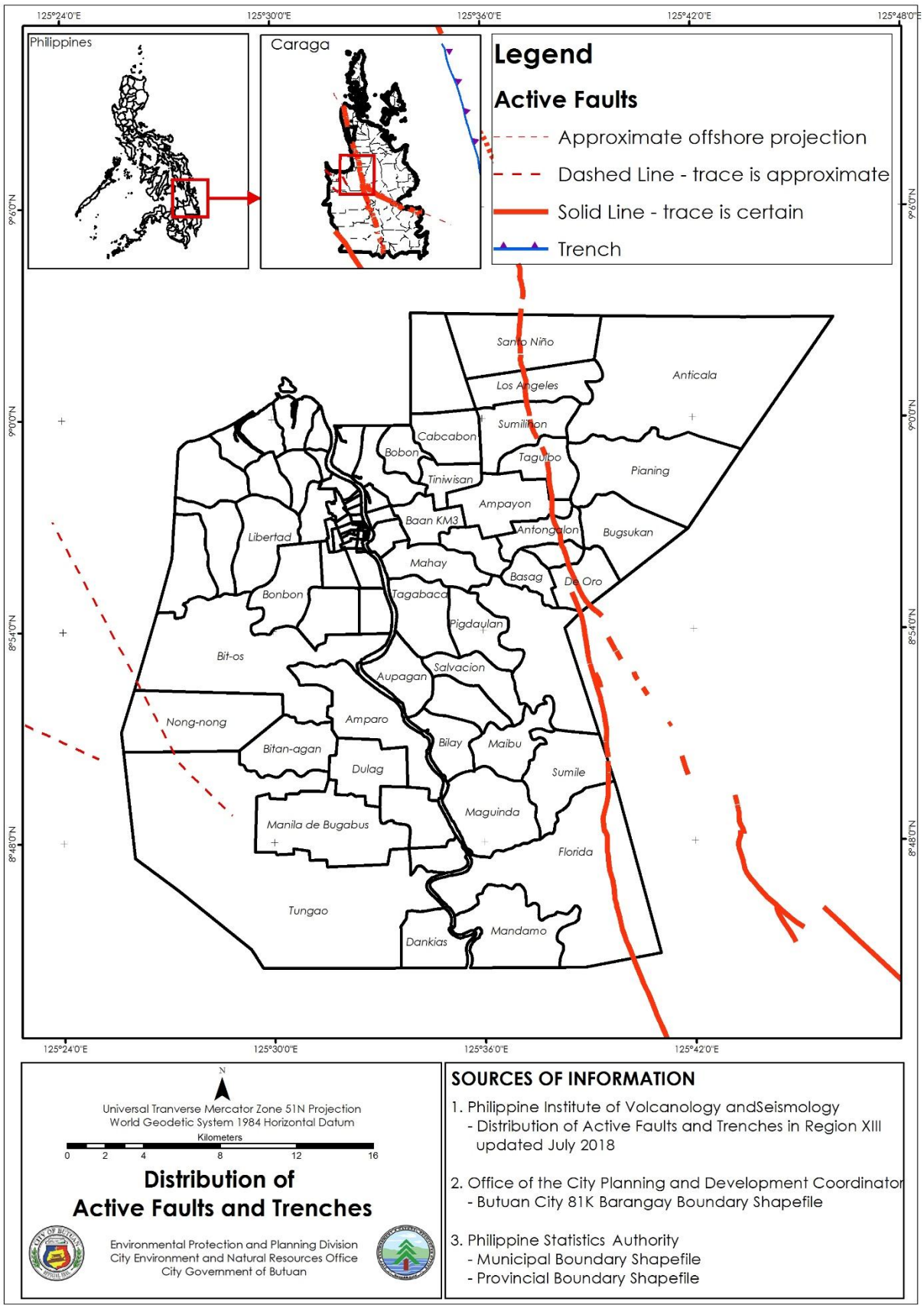

Figure 10. Active Fault Line Map of Butuan City.

In terms of land forms, the BSWM study classified Butuan City into nine (9) broad landform categories as follows:

Coastal Lowlands. Coastal landform is formed by the combined of waves, streams and the sediments that include the deposition of heterogeneous assemblages of classic materials such as river sediments, coral and shell debris. This major landscape comprises the coastal areas regularly submerged by tidal fluctuations, locates slightly above or below mean sea level including its immediate environs. Tidal flats composed of fishponds and mangrove/nipa stands belong to this physiographic unit. This type can be found in the seashore of Butuan Bay particularly in Barangays Lumbocan, Masao and Abilan, and in the flat areas of Maug, Ambago, Babag, Agusan Pequeño and Banza.

Broad Alluvial Plain. Represents most of the alluvial plains in Butuan. Said landscape was formed mainly by the accumulation of unsorted and unconsolidated clay, silt, sand, pebble and gravel size fragments of mixed volcanic and sedimentary origins, eroded transported through surface run-off and flows from the surrounding hills and mountain. The physiographic units under this landform are the river levee, river terrace, broad plain, swamp and marshes.

River levees are found in land adjacent to agusan River and other streams which have been affected by over bank flow. River terraces are those composed of upper and lower terraces found along the areas of amparo, Mandamo, Bilay, Maguinda and San Mateo. Broad plains constitute the broad alluvial plains of Abilan, Ampayon, Mahay, Los Angeles, Aupagan, Libertad and Dankias.

Minor Alluvial Plains. Represent the valley floors which were formed by the accumulation of alluvial materials. This feature is found in Barangay Bitan-agan and those areas at the base of the hill north of Butuan near the boundary of Municipality of Remedios T. Romualdez.

Terrace (Residual Slopes). This land is slightly above the alluvial landscape and can be found in Barangays Bancasi, Pinamanculan and Dumalagan.

Plateau Landscape. This landscape is formed either to uplift an area consolidated by sediments or by erosion of originally much larger areas of gently sloping older rocks. Areas adjacent to the ultra-basic Mount Mayapay manifest said type of landscape.

Hilly Landscape. Areas with significant relief and having a crest of 500 meters and below are classified as hilly landscapes. Sedimentary composed of land facets such as lime stones are found in the upper portion of Barangay Los Angeles.

Mountain Landscape. Mountainous terrains are results of the uplift due to tectonic stresses that produce high relief landscapes. This landscape has elevations of more than 500 meters above sea level with steep to very steep slopes of moderately to severely dissected mountain ranges. The mountains on the northeastern flank of the city and the ultra-basic mountain of Mount Mayapay exhibit this type of topography.

Miscellaneous Landform. These landforms consist of sand bars found at the shoreline of Masao, hydrosol or waterlogged areas are found in Doongan, Villa

Kananga, Kinamlutan between Aupagan and Tagabaca, Mahay and areas between Libertad and Ambago. Brackish water inundates these places especially those areas near the sea or mouth of rivers.

Riverwash. Occur as formation of flat to undulating of sand and gravel recently deposited by streams and subject to frequent changes through stream/river overflow. Said landscape is found at Taguibo River where quarrying of gravel and sand is being undertaken.

Topography, Slope and Elevation. As shown in the slope map (Figure 11), topography of Butuan City varies from flat to rolling and steep to very steep. The flat areas with a slope range of 0-2% are those situated along the coastal Barangays of Masao, Lumbucan, Pagatpagatan and Pinamanculan. These flat areas can also be observed within the alluvial plains of the city. The steep to very steep areas are located on the eastern, western and southern portion of Butuan with the highest elevations extended to about 700 meters. Below contains the area for each slope range in Butuan. (The topographic map is presented in Figure 12).

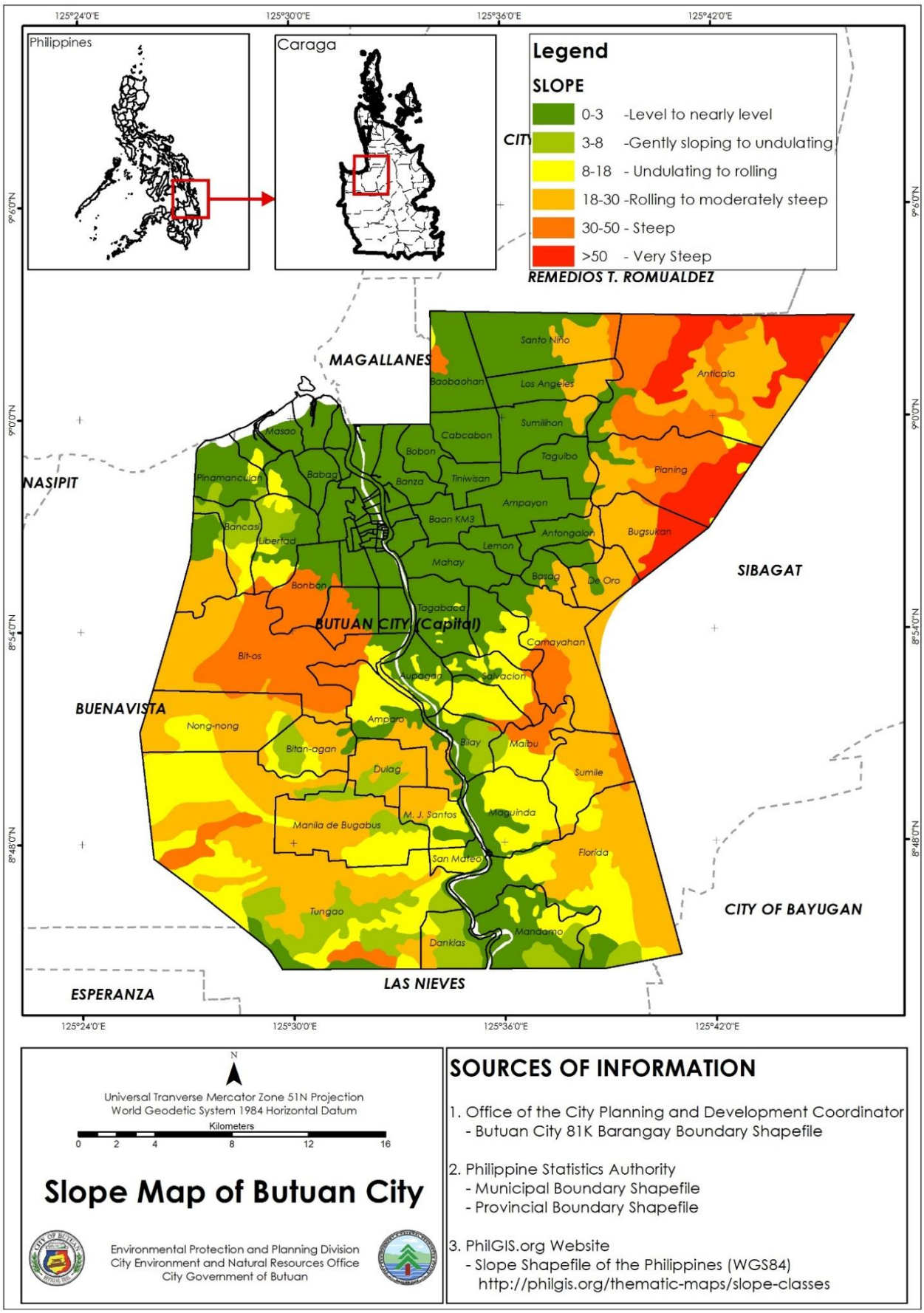

Figure 11. Slope Map of Butuan City

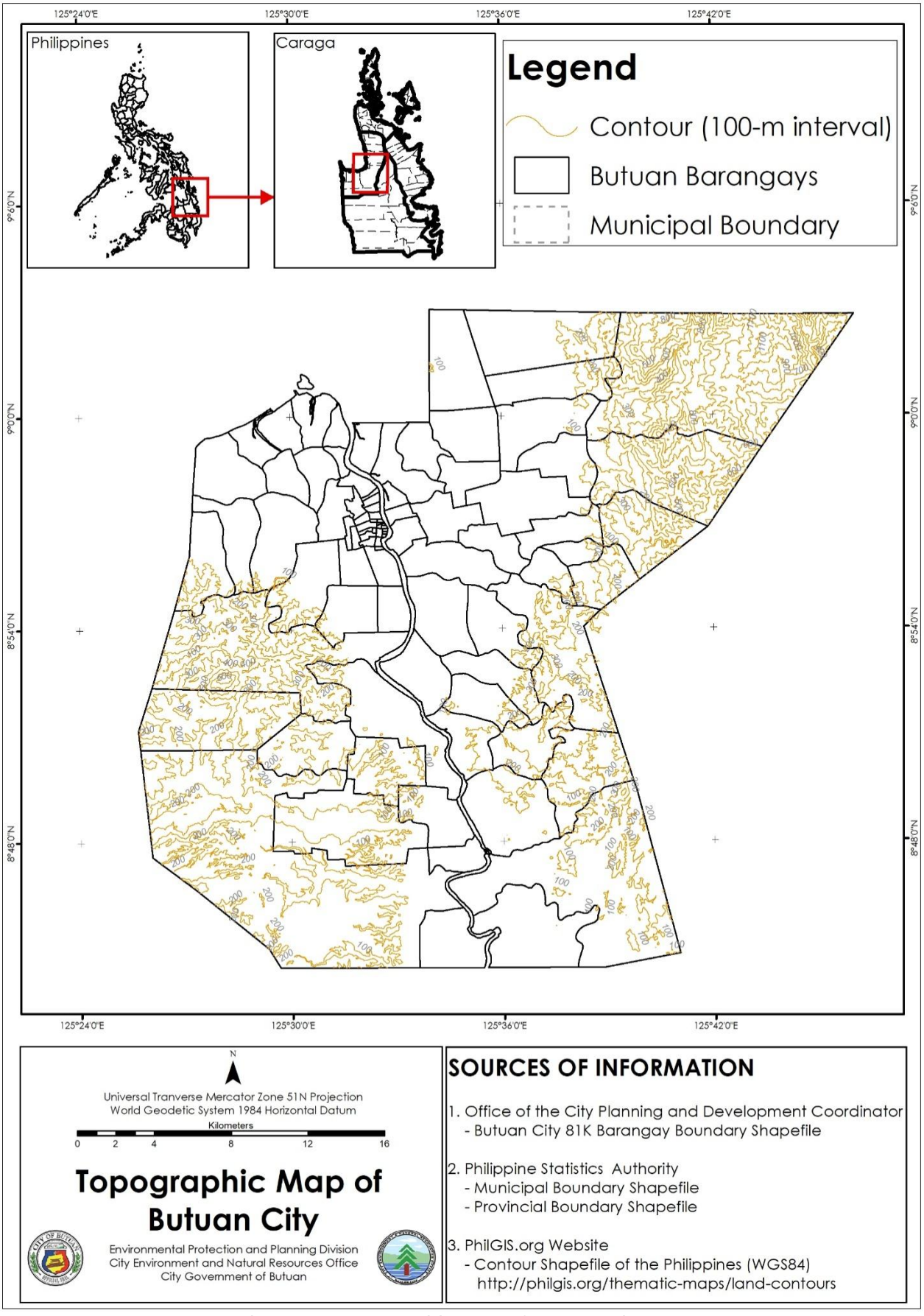

Figure 12.Topographic Map of Butuan City.

Soil Type. Based on the landform categories, BSWM classified the soils of Butuan City into 9 soil series. The soil series are differentiated according to parent of material of the soil, physiographic position, a texture depth and drainage conditions. These soils were further sub-classified into 33 soil mapping units grounded of a range of characteristic such slope, erosion, class, rockiness and flooding. Figure 13 below shows the characteristics of the soil series and their corresponding location and area coverage and the geologic map indicating the distribution and the extent of the SMU's.

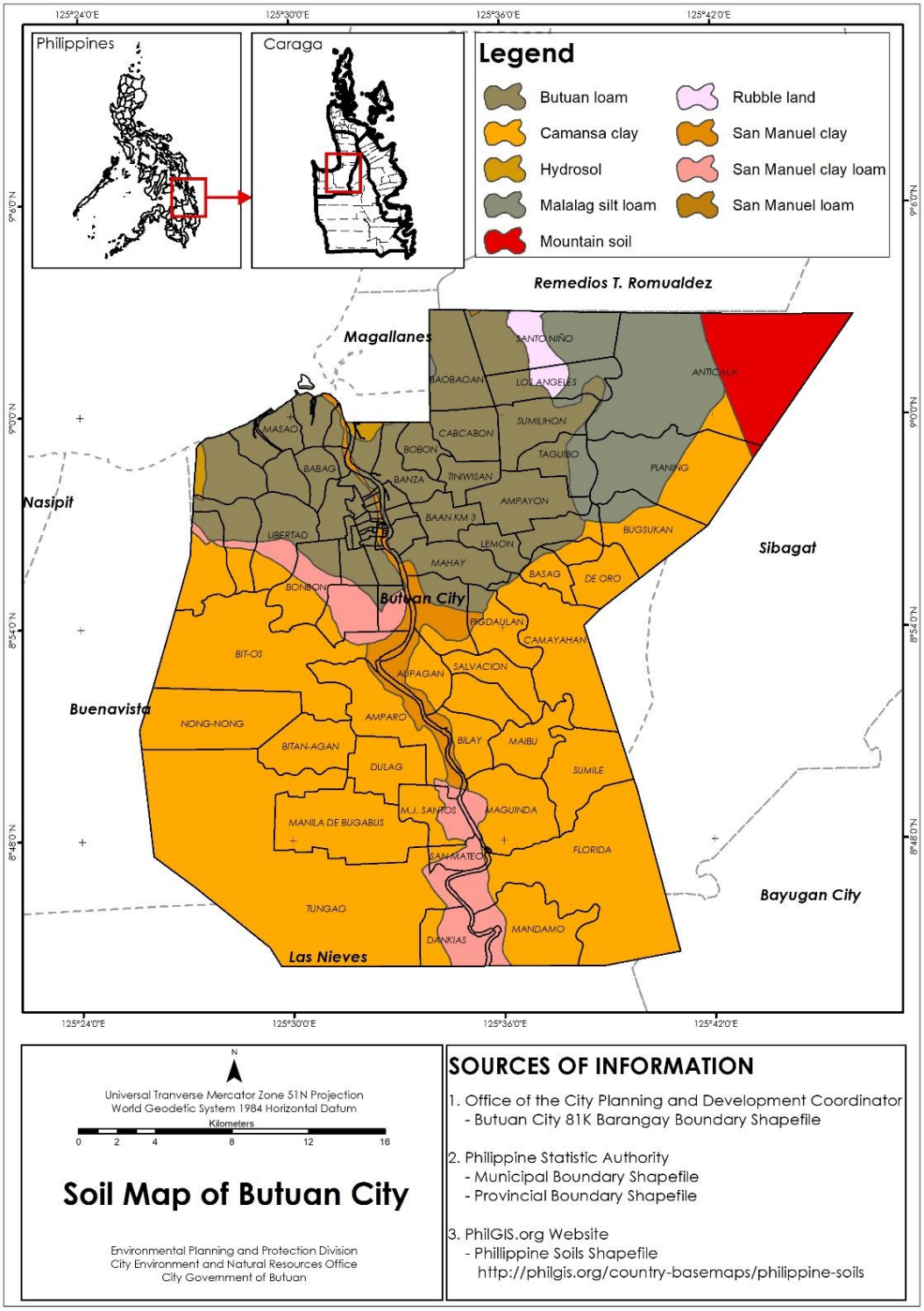

Figure 13. Soil Map of Butuan City

CHAPTER – III

CURRENT SOLID WASTE MANAGEMENT CONDITIONS

3.1 Institutional Arrangements

The City Mayor's Office (CMO) through the Ecological Solid Waste Management Board (ESWMB) and the City ENRO together with the Sangguniang Panlungsod (SP) through the Committee on Environment and Natural Resources are the major city government offices mandated by existing national laws and ordinances to develop and implement sustainable programs and policies pertaining to solid waste management in Butuan City. The ESWMB oversees the implementation of RA 9003 and other SWM related policies and ordinances. All plans and programs are cascaded to the barangay through its corresponding Barangay Ecological Solid Waste Management Committee (BESWMC). Moreover, the City ENRO and the City Planning and Development Office (CPDO) together with City Legal Office and PNP are tasked to monitor and evaluate all the stakeholders in terms of SWM compliance. Figure 14, shows the organizational structure of the City Government of Butuan in terms of solid waste management.

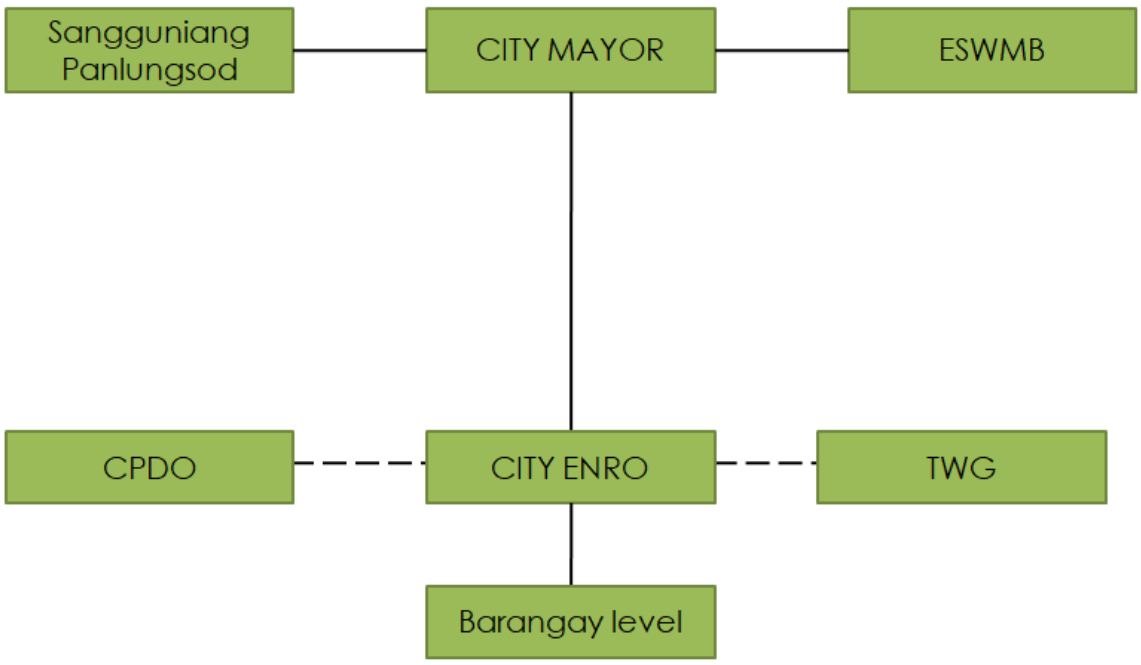

Figure 14.Solid Waste Management Structure of the City Government of Butuan.

The Butuan City Ecological Solid Waste Management Board. The BCESWM Board was reconstituted through EO No. 23 series of 2017. The Board

consists of representatives from the concerned city government offices, different regional-line agencies, NGOs, Academe and other stakeholders. Table 19 shows the composition of the BCESWMB.

Table 19. The BCESWM Board composition of Butuan City.

COMPOSITION	POSITION
City Mayor	CHAIRMAN
SP Chairman, Committee on ENR	VICE CHAIRMAN
City ENRO (ESWM Division and CGZW)	SECRETARIAT
President, LIGA ng mga Punong Barangay	MEMBER
Chairperson, SK Federation	MEMBER
Representative, SP-Accredited Environmental NGO	MEMBER
City Health Officer	MEMBER
City Planning and Development Coordinator	MEMBER
City Engineer	MEMBER
City Agriculturist	MEMBER
Regional Director, DENR-EMB	MEMBER
Regional Director, DTI	MEMBER
Regional Director, DepEd	MEMBER
Regional Director, CHED	MEMBER
Regional Director, TESDA	MEMBER
Representative, Recycling Industry	MEMBER
Representative, Manufacturing and Packaging Industry	MEMBER
Representative, Butuan City Police Office	MEMBER

The duties and responsibilities of the BCESWM Board as provided by RA 9003 and enhanced by Executive Order No. 23 series of 2017 are as follows:

a. Develop a comprehensive, integrated and sustainable City Solid Waste Management Plan (CSWMP);
b. Integrate the best solid waste management programs (SWMP), practices and strategies implemented by the various component barangays in the development of the CSWMP;
c. Adopt measures to promote and ensure the viability and effective implementation of the SWMP in all component barangays;
d. Monitor the implementation of the CSWMP in coordination with the component barangays and concerned non-government organizations (NGOs);
e. Adopt specific income-generating measures to promote the viability of the SWMP;
f. Oversee the implementation and enforcement of the CSWMP;
g. Convene regular meetings for purposes of planning, coordination and reporting of the status on the implementation of the CSWMP;
h. Review every two (2) years or as need arises, the CSWMP for purposes of ensuring its effectiveness, sustainability and significance in relation to local and international developments in the field of SWM;
i. Develop specific mechanisms and guidelines for the effective implementation of the CSWMP;

j. Recommend to appropriate local government authorities' specific measures or proposals for a franchise or build-operate-transfer agreement with duly-recognized institutions, pursuant to RA 6957, to provide either exclusive or non-exclusive authority for the collection, storage, processing, recycling and disposal of City solid wastes. The proposals shall take into consideration appropriate government rules and regulations on contracts, franchises and build-operate-transfer agreements.
k. Provide the necessary logistical and operational support to component barangays in consonance with subsection (f) of Section 17 of RA 7160 or the Local Government Code of 1991.
l. Recommend measures and safeguards against pollution and for the preservation, conservation and rehabilitation of the natural ecosystem;
m. Coordinate the efforts of component barangays in the implementation of the CSWMP; and
n. Call on any agency or sector, as may deem necessary, for support and/or other appropriate action.

The Butuan City ESWM Board list of activities are presented in Table 20.

Table 20. Butuan City ESWM Board list of activities.

ACTIVITY	SCHEDULE	REMARKS
1. Review and approval of the 10-Year ESWM Plan.	Every 5 years or as need arise.	City ENRO ESWM Division as secretariat. ESWMB endorse the 10 year SWM Plan
2. Review on the Implementation of SWMP	Every 2 years or as need arises	City ENRO Environmental Protection and Planning Division review and revise the existing ESWM Plan.
3. ESWMB Meeting	Quarterly	The reconstitution of the board member just approved last 15 August 2017

Barangay ESWM Committee. Pursuant to the provisions of RA 9003, all barangays are required to create their Barangay ESWM Council. Table 21 shows the composition of the Barangay ESWM Committee

Table 21. Composition of the Barangay ESWM Committee.

COMPOSITION	POSITION
Punong Barangay	CHAIRMAN
Kagawad on Environmental Protection	MEMBER
SK Chairman	MEMBER
President, Home Owner's Association	MEMBER
Representative, DepEd	MEMBER
Representative, Religious Sector	MEMBER
Representative, Business Sector	MEMBER
Representative, NGO	MEMBER

The Barangay ESWM Council shall be responsible in the formulation of the community solid waste management plans and implementation of SWM programs and activities pursuant to RA 9003. All the 86 constituent barangays of Butuan City have already established/created their Barangay ESWM Committee.

SP Committee on Environment. The committee is in charge of the review and amendment of existing SWM ordinances. In addition, the committee is also tasked to oversee the implementation of said ordinances. It also acts as co-chair of the BCESWM board.

ESWMD. The City ENRO Ecological Solid Waste Management Division is mandated to manage the daily operations of the Dumalagan sanitary landfill facility (SLF). It is also tasked to establish collection points, collection schedule, route and disposal. The ESWMD coordinates with every barangay in the implementation of SWM program of the city and monitoring of MRF functionality.

Green Ground Zero Waste. The GGZW was formed, organized and launched on September 11, 2011. The objective of the program was to intensify the development of IEC activities and campaign materials pertaining to SWM such as but not limited to waste segregation, recycling, reusing and composting, in the household level. It was also designed to provide technical support in the constituent barangays in the development of their Barangay Solid Waste Management Plan (BSWMP). However, since the launching of the GGZW, the program became passive and ineffective in delivering its core functions. Although there are households who practice waste segregation, the prevalent increase of illegal dumping of mixed wastes on streets, sidewalks and vacant lots implied that majority of the households do not practice proper waste segregation thus negating the existing of the said program.

In addition, SP Ordinance 2385 – 2002 requires all owners and operators of business and commercial establishments to undergo a half-day seminar on SWM prior to the issuance and release of their corresponding business permits and license to operate documents. Through this ordinance, the Joint Inspection Team (JIT) was also formed. The JIT functions as a multi-partite monitoring team (MMT) that inspects all business establishment's compliance to the said ordinance. However, the operation of the JIT have been inefficient in the last seven (7) years, impairing the above-mentioned ordinance. Majority of the commercial and business establishments within the city do not have appropriate and properly labeled waste receptacles.

Furthermore, the need to intensify IEC campaign and law enforcement on SWM is urgent. It should be noted that majority of the violations recorded by the City ENRO are: (1) littering; (2) absence of appropriate waste receptacles; and (3) the failure of households and establishments to maintain the cleanliness of their vicinity and surroundings. Table 22 shows the cases of violations pertaining to the Anti-Littering Ordinance of the City in the last 5 years.

Table 22. Cases of violation to the Anti-Littering Ordinance, Anti-Illegal Dumping and Plastic Ordinance

ITEMS	YEARS OF IMPLAMENTATION					TOTAL
	2012	2016	2017	2018	2019	
No. of apprehensions	1,966	3,600	3,451	3,083	8790	20,890
No of violators who rendered community service	415	2,400	1,132	945	1,208	6,100
TOTAL						26,990

Source: City ENRO, Enforcement Division (2019).

EPPD. The City ENRO Environmental Protection and Planning Division is tasked to revise and update the 10 year ESWM Plan. In addition, the EPPD issues environmental clearance and conducts SWM related activities like coastal cleanup, proper waste segregation, recycling and disposal.

Enforcement and Regulation Division (ERD). The City ENRO ERD is mandated to enforce the provisions of existing SWM policies and ordinances. It also conducts inspection to the different establishment issued with environmental clearance. It also conducts monitoring of illegal dumping incidents, issues corresponding fines and penalties to apprehended stakeholders and manages community service activities within the city.

3.2 Inventory of Equipment and Staff

In order to operationalize an efficient waste collection system for the 45 serviced barangays, The ESWMD utilizes a total of 8 garbage collection vehicles. However, these equipment and facilities are still not enough to cater future expansion of collection service areas. In order to resolve this emerging problem, the City Government explored the strategy to procure additional equipment in the next two years to facilitate the daily operation. Table 23 shows the inventory of SWM equipment.

Table 23. List of Solid Waste Management Division, ESMWD, 2020

EQUIPMENT	NO. OF UNITS	CAPACITY	CONDITION
1. Mini-dumptruck (6-wheeler)	6	7 cubic meter	Serviceable
2. Dumptrcuk (10 Wheelers)	2	10 cu.m	Serviceable
3. 1 Backhoe	1		Serviceable
4. Bulldozer	1		Serviceable

*Source: ESWMD 2019

The City ENRO ESWMD has a total of 89 personnel and staff for its daily operations. These employees were trained on proper waste segregation and collection. However, as much as the number of employees is sufficient in terms of the office's staffing pattern, majority of these employees are multi-tasking and/or detailed in other offices of the City Government. Table 24 shows the inventory of ESWM Division personnel of the City ENRO.

Table 24. List of SWM personnel (City ENRO, 2020).

ITEM	STATUS OF EMPLOYMENT			TOTAL
	Regular	Contract of Service	Job Order	
Public Service Officer IV	1			1
Environmental Mgt. Specialist I	1			1
Environmental Mgt. Researcher		1		1
Assistant Leadman		2		2
Driver		13		13
Administrative Aide III	1			1
Administrative Aide I (Laborer)	13	0	57	70
TOTAL	**16**	**16**	**57**	**89**

3.3 Waste Segregation and Reduction at Source

In order to comply with the provisions of RA 9003, the City Government of Butuan, specifically the Office of the City Mayor and the Sangguniang Panlungsod (SP) released and approved Executive Order Nos 39 (s2010) and 191 (s2016) and the Plastic Regulation Ordinance (2017) of Butuan City, respectively. The executive orders direct all barangays to implement waste segregation in the household level. It also implements a “No Segregation, No Collection” policy and only residuals and recyclables will be collected in the different households. The executive orders also mandate the barangays and households to promote composting of biodegradable wastes. Meanwhile, the Plastic Regulation Ordinance, prohibits the production and utilization of plastic bags and plastic by-products as packaging material of all commercial, food, industrial establishments within the city.

All barangays are given appropriate trainings, lectures and workshop pertaining to composting, recycling and proper waste segregation through the conduct of continuous IEC by the City ENRO.

3.4 Collection

The City ENRO ESWMD waste collection and transport services cover the 45 serviced barangays. Majority of these barangays are in the Central Business District (CBD) and are deemed classified as urban and/or urbanizing barangays. The serviced barangays are primarily composed of an increasing number of households, commercial establishments, industries, health institutions, academe, and government offices. Meanwhile, it is generally arranged that, with the City Government’s limitations in terms of SWM facilities and resources, it is assumed that the barangays not covered with the waste collection and transport system of the City, have insignificant volume of generated waste. The barangays not covered by the ESWMD collection are all rural barangays. However, these barangays are required to develop and implement their own waste management system and further establish their own MRFs and composting areas/facilities.

Table 25 and Table 26 show the waste collection schedule and the waste collection service areas, respectively.

Table 25. Waste collection schedule of Butuan City, (City ENRO, 2019).

DAILY SCHEDULE OF COLLECTION			
TYPE OF WASTE	**SCHEDULE OF COLLECTION**	**NO. OF BARANGAYS**	**SPECIFIC LOCATION WASTE COLLECTION**
Bio/ Residual/Special	3rd Shift: 5:00PM-11:00PM	14 Serviced Barangays	Designate Collection Point/MRF
Residual/Special	1st Shift: 5:00AM-11:00AM	2 Serviced Barangays includes City Hall	Designate Collection Point
ONCE A WEEK COLLECTION			
Residual/Special	1st Shift: 5:00AM-11:00AM (Sat, Sun, Wed, Fri)	08 Serviced Barangays	Designate Collection Point/MRF
TWICE A WEEK COLLECTION			
Residual/Special	2nd Shift: 11:00AM-5:00PM (Sat, Mon, Tue, Thur)	04 Serviced Barangays	Designate Collection Point/MRF
TRICE A WEEK COLLECTION			
Residual/Special	2nd Shift: 11:00AM-5:00PM (Tue,Fri,Sun)	03 Serviced Barangays	Designate Collection Point/MRF
6 TIME A WEEK COLLECTION			
Bio/ Residual/Special	1st shift: 5:00AM-11:00AM (Sat, Mon, Tue, Wed,Thur, Fri, Sun) 2nd Shift: 11:00AM-5:00PM (Mon-Sat)	03 Serviced Barangays includes OCEE	Designate Collection Point/MRF

Table 26. Waste collection service areas in Butuan City, (City ENRO, 2019).

BARANGAYS	**BARANGAYS**
Agao Poblacion	Sikatuna
Baan Km. 3	Silongan
Bading	Tandang Sora
Bayanihan	Urduja
Buhangin	Obrero
Imadejas	Agusan Pequeno
Diego Silang	Ambago
Golden Ribbon	Ampayon
Dagohoy	Bancasi
JP Rizal	Bit-os
Holy Redeemer	Bonbon
Humabon	Doongan
Lapu-lapu	Libertad
Leon Kilat	Lumbocan
Limaha	Masao
Mahogany	San Vicente
Maon	Tiniwisan
Port Poyohon	Villa Kananga

New Society Village	Pagatpatan
Ong Yiu	Pangabugan
Rajah Soliman	Mahay
San Ignacio	Banza
Baan Riverside	

Source: City ENRO, ESWMD (2019).

3.5 Transfer Equipment

Currently, the City Government of Butuan has purchased 32 Mini-dump trucks to augment the collection services throughout the City. Six units were intended for the SWM operations of the ESWMD and the 26 units were distributed to the BLGU.

Figure 15. Mini-dump trucks use for garbage collection.

3.6 Materials Recovery and Processing

In compliance with RA 9003, aside from the centralized Materials Recovery Facility (MRF) of the City Government located adjacent to the SLF in Barangay Dumalagan, all barangays, especially the 45 SWM-serviced barangays of the city have already established their own MRFs and Pick-up points. Mixed wastes are being sorted in these facilities. However, upon inspection and observation, majority of the MRFs established in each barangay are not maintained and utilized according to its supposed function. MRFs in the barangay level have become mini-junkshops and/or dumping sites of waste – becoming breeding ground for insects and other vectors which may cause diseases/illnesses.

The City Government of Butuan is looking into the possibility of constructing a Centralized MRF likewise, three (3) Clustered MRFs and Composting Areas as the drop off points of mixed and biodegradable wastes coming from the different service barangays.

In addition, the facilities are off-limit to the entry of unauthorized individuals and no scavengers should be allowed to enter the facility and perform the sorting because, (1) it is the job of the City ENRO; (2) possible exposure to toxic and hazardous wastes; (3) impairs and damages health and; (4) it is not sustainable.

Figure 16. Area for sorting of wastes.

In terms of converting and processing of biodegradable wastes, all barangay councils are required to establish their own composting facility. However, with the current status and limitations of each barangay in terms of funding, technical information and skills, and technology, this was never materialized and/or was not fully-implemented. There are also barangays, especially in the CBD that do not have enough space for the establishment of their composting facilities.

3.7 Waste Disposal Facility

The City Government's Sanitary Landfill Facility (SLF) is located in a six (6) hectares timberland area in barangay Dumalagan. It is already operating in the last four years and paved way to the closure of the old open dumpsite located in barangays Doongan and Dulag, respectively. The SLF was funded by the Development Bank of the Philippines (DBP) and its site location was approved by the Department of Environment and Natural Resources (DENR) by virtue of a Special Land Use Permit (SLUP).

Butuan City's Dumalagan Controlled Sanitary Landfill (SLF) was established and became operational since June 29, 2016. The said SLF was issued with Environmental Compliance Certificate(ECC) No. R13-0909-0016 by DENR-EMB. Meanwhile, a feasibility study is being conducted for the establishment of the Centralized waste recycling and processing plant (with installed waste converter).

Theoretically, only residual wastes are allowed to be disposed in the SLF in order to extend its life span. However, on-site inspection suggests that little percentage of mixed wastes were still being dumped in the SLF. The necessity to establish efficient technologies for waste diversion is of prime consideration by the City Governments' intention to improve its solid waste management system.

Figure 17. Sanitary Land Fill Cell

Safe Closure and Rehabilitation. The DENR EMB issued Authority to Close (ATC)for Doongan Open Dumpsitedated April 2012 approving the submitted safe closure & rehabilitation plan by the city based on the guidelines and standards of safe closure set by EMB-DENR Caraga Region through NSWMC Resolution No. 05, series of 2005 and DAO No. 09, series of 2006.

Meanwhile, the Barangay Dulag dumpsite was established and operated on February 2012. The City Government ordered the closure of the said dumpsite last August 2016. Currently, the final closure and rehabilitation plan of the said dumpsite was already being formulated and in the process of instituting initial measures for its safe closure.

3.8 Special, Hazardous and Infectious Waste

Special Waste generated and collected from the different barangay are being deposited and stored in the septic vault located at the Dumalagan SLF. Special waste comprises paint containers, expired medicines, spray canisters and cosmetics should be temporarily deposited in a storage area. Electronic devices such as but not limited to TVs, cathode ray tubes and electrical wastes (e.g. busted bulbs, filaments, etc.) are also considered as special waste.

In addition, hazardous and infectious wastes from health care facilities are not collected by the City ENRO ESWM Division considering also that the SLF did not contain a special cell intended for this particular type of waste and in pursuance also with DENR-DOH Joint Administrative Order No. 005-02. However, health care facilities are required to acquire the services of a third party for the treatment, storage and disposal (TSD) provider to manage this type of waste.

3.9 Markets for Recyclables

At present, the City Government of Butuan is advocating organic farming. This directly and indirectly promotes compost products from green wastes. As experienced, upland farmers, crop planters and other walk-in clients avail compost as soil conditioners from the processed green wastes and other biodegradable waste materials.

By virtue of RA 9003, the City ENRO ESWMD only collects residual and special waste. Recyclables and compostable are being manage by the barangay in their respective MRFsfor additional income and to subsidize their SWM Programs.

3.10 Information, Education Communication (IEC)

Advocacy campaigns pertaining to solid waste management is anchored from 1a the national "War on Waste" program initiated since 1997. The program has already completed a 20-year implementation cycle at various public schools and communities in Butuan City. Initial efforts included three major components namely, education, engineering and enforcement.

The education component of the City Government's IEC initiatives involves the conduct of trainings in ESWM for trainers, administrators, teachers and parents. Meanwhile, the engineering of component of the campaign involves the orientation on waste segregation, marketing of recyclables, design and construction of composting areas and putting up of edible gardens. Moreover, the enforcement component includes programs pertaining to incentives and awards, providing sanctions to violators, empowering and deputizing Barangay Bantay Kahinlo Volunteers (BBKV). The crafting of appropriate ordinances pertaining to ESWM and environmental conservation are also included.

The target participants in the conduct of IEC were the barangays councils, households, business establishments, institutions, religious institutions, POs, NGOs, and other groups 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". Reducing the individual's ecological footprint in order to resolve the increasing rate of waste generation.

IEC Core Messages. Generally, the IEC materials that will be developed shall follow the fundamentals of the waste management hierarchy. These are as follows: source reduction and minimization of wastes generated at source; resource recovery, recycling and reuse of wastes at the barangay; efficient collection, proper transfer and transport of wastes by the City and; efficient management of residuals wastes.

Linkage to other partners such as but not limited to media groups, socio-civic organizations, POs, NGOs shall be established. To ensure the support of these groups in the IEC campaign, it shall be formalized through a Memorandum of Agreement (MOA) defining the roles of each agency/organizations involved. Regular feed backing and assessment will be conducted with the partners.

Table 27. Summary of core messages implemented per sector.

SECTOR	COORDINATION WITH OTHER AGENCIES	CORE MESSAGES
City Government Workers and Officials	General Services Office/ City Planning/PIO/CMO/City ENRO	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. 3 R (Reduce, Re-use and Recycle
Barangay LGU's and Workers	LGU, BLGU, DENR – EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191.
Commercial and other business establishments.	LGU, BLGU, DENR – EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility 3 R (Reduce, Re-use and Recycle
Government and public health care facilities.	LGU, BLGU, DENR – EMB, DOH	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility To comply with RA 6969 for special/hazardous wastes
Public and private schools, colleges and universities.	LGU, BLGU, DENR EMB, CHED, DEPED	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility To comply with RA 6969 for special/hazardous wastes 3 R (Reduce, Re-use and Recycle
Residences/Households under the jurisdiction of Butuan City	LGU, BLGU and DENR EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To make their own biodegradable wastes/composting facility. To come-up with technology to use the recyclable wastes at source. 3 R (Reduce, Re-use and Recycle
All existing Religious Groups and Churches	LGU, BLGU, PO, DENR EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191.

		To establish their own MRF Facility 3 R (Reduce, Re-use and Recycle.
Registered NGO, Peoples Organization and Association	LGU, BLGU, PO, DENR EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. 3 R (Reduce, Re-use and Recycle.

IEC Approach. Brochures and fliers which discuss ecological solid waste management and its principles were developed. The theories and principles pertaining composting, especially 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. Table 28 shows the planned SWM IEC activities of the City Government of Butuan.

Table 28. ESWMP IEC implementation action plan.

ACTIVITY	TARGET AUDIENCE	MESSAGE	METHOD	TIMEFRAME
Reorientation on RA 9003	8 Stakeholders; Subdivisions, Gov't Offices/ RLA's/Province, Schools, Establishments/Commercial/ Hotels, Utilities, Sari-sari/SME's/Household (Barangays), Church, Hospitals and Industries	Increase awareness relative to the role of the barangay and effective implementation of the ESWM program of the school and stakeholders	Seminar, lecture	Every Quarter
	City ENRO staffs	Increase awareness relative to the salient features of the law	Seminar, lecture	
Evaluation of the Butuan City Search for the Most Environmet Friendly Barangays	86 Barangays	Ensure the sustainability and efficacy of the SWM programs of the 86 barangays	Interview, Site Inspection and coaching by the evaluators	Annual

Evaluation of the Butuan 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, Site Inspection and coaching by the evaluators	Annual
Massive Barangay Clean-up relative to the Earth Day Celebration and Mangrove planting	86 Barangays	To find possible solutions to the problematic areas within their respective barangays	Actual clean-up drive	Every 22nd of April and quarter
Localized Environment Week Celebration	86 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	86 Barangays	Plastic waste minimization	Recorida, Store to Store Campaign, Video Presentation, Lecture/seminar	Quarter

ESWM Training. The Barangays were given training/seminar workshop with participants composed of the Barangay Chairman, and the Barangay Kagawad on Environment pertaining to the evaluation of RA 9003 and EO 191 compliance. The training workshop enabled them to formulate their vision/mission statements and action plans, which will then be incorporated in the barangay ESWM plan.

The City ENRO have also conducted and facilitated various cross visits to nearby cities and municipalities to observed exemplary waste management practices and enabled the participants to gain insights for them to apply in their respective barangays. Table 29 shows the GGZW behavioural change communication for proper SWM.

Table 29. GGZW behavioral change communication for proper SWM.

FRAMEWORK	STRATEGIES
EDUCATION • Promote awareness of the linkages between and among wastes, health and environment & development issues to the community. • Inculcate on one's mind that some wastes can be converted into an environment friendly and income generating opportunity for the community. • CENRO in coordination will continue to coordinate with the DepEd to facilitate inclusion of solid waste management into the school curricula. Inculcating the importance of solid waste management into the young minds of the students will somehow bring the practice even in their own homes. • Community Affairs and Information Division of CENRO will intensify its IEC efforts and will be complemented by putting in place an effective and efficient method of collection, transport storage and disposal.	• Household with best SWM practice (Brgy. level contest) • Barangay with best SWM practice (City-wide contest) • Barangay with the highest percentage household compliance on waste segregation contest (City-wide) • Well organized barangay in the implementation of SWM contest (City-wide) • 5 Cleanest and 5 Dirtiest Barangays Contest (City-wide) • Poster Making Contest on SWM and environmental concern (City-wide) • For TV, Film clips demonstration on waste management. The City shall allocate annual funds for the payment of airtime in the showing of the demo system. The film clips will show the benefits in practicing ecological waste management system in terms of money, health and cleanliness of the surrounding and love of nature. • For movie advertisement on waste management. The movie ads on proper waste management will be shown in all movie houses in the City as intermission to regular movies. The City shall allocate annual funds for the production and showing of the movie advertisement on waste management. • For billboard advertisement. The billboards to be installed will be large enough to catch the attention of the general public and to be placed in strategic places.

3.11 Butuan City SWM Budget Allocation, Revenue and Expenses

The average annual budget allocated for solid waste management in Butuan City is approximately P 9.4 million, representing 13 % of the city's internal revenue

allotment (IRA) from 20% of Development Fund. The current annual budget is low relative to Butuan City's land area, population and rate of waste generation. The annual SWM budget could not cover the purchasing of new waste compactors and the upgrading of SWM facilities and services of the City ENRO. Table 30, Table 31 and Table 32 shows the average annual SWM budget, expenditure and revenue of Butuan City.

Table 30. Annual SWM Budget of Butuan City.

ITEM	BUDGET ALLOCATIONS			
	2015	2016	2017	2018
PS	3,115,148.00	3,381, 612.00	3,060,848	3,060,848
MOOE	5,958,927.00	1,370,503.74	16,660,310.00	11,200,220.22
CO	265,300.00	160,150.00	78,050.00	-
TOTAL	**9,339,375.00**	**4, 912,265.74**	**19,799,208.00**	**14,261,068.00**

Source: City ENRO, Butuan City.

Table 31. Average annual SWM expenditure of Butuan City.

COMPONENTS	ITEM	COSTS
Labor	Permanent Job Orders Casuals Contract of Service	3,314,988.445 5,669,240.25 0 216,000.00
Operation	Fuel and Oil Repair and Maintenance	5,605,149.90
Sanitary Landfill Facility (SLF)	Repair and Maintenance Additional Construction	250,000 (2015 Only)
Others	Special Projects Supplies and materials	 1,430,837.05
	TOTAL	**16, 486, 215.65**

Source: City ENRO, Butuan City

Table 32. Annual SWM Revenue of Butuan City.

ITEMS	REVENUES COLLECTED				
	2014	2015	2016	2017	2018
Garbage Collection Charges	881,320.00	901,250.00	930,679.00	1,052,030.00	1,082,030.00
Anti-Littering	228,700.00	32,550.00	83,350.00	353,150.00	447,500.00
Anti-illegal Dumping					42,000.00
Others					
TOTAL	**1,110,020.00**	**933,800.00**	**176,419.00**	**1,405,180.00**	**1,571,530.00**

Source: City ENRO, Butuan City

3.12 Key Issues on the City's Solid Waste Management

From series of reports and upon the conduct of various stakeholder's and public consultation, the City Government of Butuan in coordination with the City ENRO identified key issues and problems pertaining to the solid waste management status of Butuan City. Table 33 shows the identified key issues pertaining to SWMP implementation.

Table 33. Shows the identified key issues pertaining to SWMP implementation.

KEY ISSUES/PROBLEMS	PROPOSED SOLUTIONS
Lack of additional enforcers	Hire additional enforcers
Lack of RA 9003 compliant facilities	Construction of admin building training center, Motor pool at SLF.
Insufficient budget allocation	Look for a possible partnership
Improper segregation in some household level	Intensify IEC and enforcement
Insufficient solid waste management facilities	Procurement of Solid Waste Equipment
Minimal Volume of Mixed wastes are unintentionally disposed in the SLF	Encourage barangay officials to intensify proper waste segregation.
Unavailability of buy back centers	Look for possible partnership
Lacking compost facilities	Additional composting facilities and manpower.
Lack of service vehicle for the personnel to conduct monitoring, seminar, workshop, etc.	Provide service vehicle or provide fare allowance for the assigned personnel.

CHAPTER – IV
WASTE CHARACTERISTICS

The Butuan City WACS was conducted in partnership with Caraga State University (CarSU) Mathematical and Statistical Computing and Research Center (MSCRC) sometime in 2019. A WACS workshop and seminar orientation on SWM was conducted from May 11 – 15, 2019. The orientation was primarily focused on the important features and requirements concerning the study. The experimental and operational frameworks of the WACS were discussed with emphasis on its statistical component. The sample size was calculated using the formula of Cochran (1977) and Bartlett (2001). The actual WACS was conducted in last week of June up to the first week of July 2019. The 7-day study included the following:

(1) households

(2) public markets

(3) general stores

(4) food establishments

(5) industries

(6) institutions

(7) recreation centers

(8) service centers and health-related agencies.

The Butuan City WACS employed a two-stage random sampling design in determining the households and establishments for every barangay that will be subjected for data acquisition. The target population of households was stratified according to its geographical and political boundaries. The barangays were classified as urban and urbanizing. Subsequently, the households were further stratified according to their income level as to high, middle and low-income class. The duration of the survey was accounted for two weeks for all the identified stakeholders.

4.1 Disposed Wastes

Households. Table 35 and Table 36 show almost the same trend on the generation of HSW across different income class in urban and urbanizing areas in Butuan City. Biodegradable wastes were generated in higher amount during weekends 75 of 150 for wealthy households and middle-class households across different days. This could be attributed to the capability of this group to buy food products and yield organic wastes. Low-income households produced non-recyclable wastes in urban areas in Butuan City, possibly because of the dependency on plastic bags. Plastic bags are commonly used for packaging food and non-food products. The

practice of utilizing plastic bags has become part and vital in the lifestyle of most people (WACS, 2019).

Table 38 shows the generation of HSW across different income class with the high-income class having the highest amount of wastes (**1.51** kg/household/day and **0.30** kg/capita/day). This could be attributed to the high purchasing capability of the wealthy household, which resulted in a greater amount of waste generation. Some researches from different parts of the world indicated that household income was positively related to the rate of household waste generation (Dennison et al., 1996; Bandara et al., 2007; Banga, 2011). Mbiba (2014) indicated in his study that areas with high-income households produced more waste per capita compared to low-income households and as households moved up the income profile, more waste will be generated in the coming decades. High-income household generated a higher quantity of recyclables (**0.56** kg/household/day or **0.11** kg/capita/day) compared to other waste categories which could indicate that any recyclable and reusable products that were not deemed useful were immediately put to waste. Middle-income households, on the other hand, had higher amount of biodegradables produced (**0.44** kg/household/day or **0.09** kg/capita/day) which could be due to their capability to access and prepare food on their own. Low-income household generated a higher quantity of non-recyclables (**0.37** kg/household/day or **0.07** kg/capita/day) which could probably be due to cheaper products consumed that produced non-recyclables and residual wastes (e.g., shampoo and toothpaste sachets) (WACS, 2019).

Table 34. Summary total household waste per waste generated.

Source		Waste Classification				Total per Source	
		Biodegradable Waste	**Recyclable Wastes**	**Non-Recyclable Waste**	**Special Waste**	***(kg)***	***(%)***
Commercial		104,406.76	30,834.76	42,467.61	14,887.74	***192,596.87***	***59.16%***
Institutional		1,747.17	516	710.66	249.14	***3,222.97***	***0.99%***
Industrial		1,058.89	312.73	430.71	150.99	***1,953.32***	***0.60%***
Household		69,269.19	20,457.47	28,175.35	9,877.34	***127,779.35***	***39.25%***
Total per classification	***(kg)***	***176,482.01***	***52,120.96***	***71,784.33***	***25,165.21***	***325,552.51***	
	(%)	***54.21%***	***16.01%***	***22.05%***	***7.73%***	***100.00%***	***100.00%***

Table 35. Waste generated in according to household income in several categories across different days in kg per household and total per capita in urban barangays in Butuan City (WACS, 2019).

INCOME CLASS			WASTE PER HOUSEHOLD (IN KG)			WASTE PER CAPITA (IN KG)		
	Weekday	Market Day	Weekend	Daily	Week	Daily	Month	Year
High Income								
Biodegradable	0.5002	0.2300	0.1850	0.46	2.9160	0.09	2.78	1013.66
Non-recyclable	0.3500	0.3950	0.3350	0.35	2.4800	0.07	2.13	775.89
Recyclable	0.4550	0.0750	1.0500	0.61	3.4000	0.12	3.64	1329.64
Special Waste	0.0300	0.0250	0.0150	0.09	0.1900	0.02	0.54	198.14
Total	**1.3352**	**0.7250**	**1.5850**	**1.51**	**8.9860**	**0.30**	**9.09**	**3317.33**
Middle Income								
Biodegradable	0.4186	0.4097	0.3920	0.49	2.8947	0.10	2.92	1066.47
Non-recyclable	0.3297	0.3241	0.3068	0.37	2.2792	0.07	2.22	810.66
Recyclable	0.2358	0.1302	0.1466	0.30	1.4559	0.06	1.79	654.85
Special Waste	0.0144	0.0078	0.0396	0.13	0.1196	0.03	0.78	286.09
Total	**0.9985**	**0.8718**	**0.8851**	**1.29**	**6.7494**	**0.26**	**7.72**	**2818.07**
Low Income								
Biodegradable	0.2604	0.2500	0.4744	0.43	2.0265	0.09	2.59	946.53
Non-recyclable	0.3983	0.2726	0.3505	0.48	2.6146	0.10	2.90	1058.46
Recyclable	0.1000	0.1503	0.1561	0.19	0.8065	0.04	1.13	412.07
Special Waste	0.0610	0.0073	0.0122	0.48	0.3244	0.10	2.85	1040.25
Total	**0.8197**	**0.6802**	**0.9932**	**1.58**	**5.7720**	**0.32**	**9.47**	**3457.30**

Table 36. Waste generated in according to household income in several categories across different days in kg per household and total per capita in urbanizing in Butuan City (WACS, 2019).

Income Class			Waste per household (in kg)			Waste per capita (in kg)		
	Weekday	Market Day	Weekend	Daily	Week	Daily	Month	Year
High Income								
Biodegradable	0.1636	0.2866	0.1682	0.24	1.2729	0.05	1.44	525.69
Non-recyclable	0.4727	0.3638	0.3292	0.46	3.0566	0.09	2.77	1010.90
Recyclable	0.4567	0.2580	0.3955	0.55	2.9368	0.11	3.27	1193.66
Special Waste	0.0970	0.0364	0.0242	0.26	0.5455	0.05	1.54	563.14
Total	**1.1900**	**0.9447**	**0.9170**	**1.50**	**7.8118**	**0.30**	**9.02**	**3293.39**
Middle Income								
Biodegradable	0.3453	0.2566	0.2858	0.41	2.2686	0.08	2.43	888.70
Non-recyclable	0.3042	0.4036	0.3040	0.36	2.2288	0.07	2.18	796.57
Recyclable	0.2000	0.2011	0.1634	0.29	1.3646	0.06	1.75	640.09
Special Waste	0.0470	0.0354	0.0579	0.42	0.3285	0.08	2.50	910.97
Total	**0.8965**	**0.8967**	**0.8111**	**1.48**	**6.1905**	**0.30**	**8.87**	**3236.32**
Low Income								
Biodegradable	0.1573	0.1371	0.2864	0.24	1.2100	0.05	1.46	532.00
Non-recyclable	0.2662	0.2186	0.1900	0.30	1.7394	0.06	1.81	660.15
Recyclable	0.2115	0.1925	0.1302	0.27	1.3800	0.05	1.61	586.64
Special Waste	0.0000	0.0008	0.0065	0.02	0.0073	0.00	0.13	46.93
Total	**0.6349**	**0.5490**	**0.6130**	**0.83**	**4.3366**	**0.1239**	**3.7171**	**45.2245**

Table 37. Waste generated in according to household income in several categories across different days (in kg per household and total per capita) in Butuan City (WACS, 2019).

Income Class			Waste per household (in kg)			Waste per capita (in kg)	
	Weekday	Market Day	Weekend	Daily	Daily	Month	Year
High Income							
Biodegradable	0.2419	0.2734	0.1721	0.30	0.06	1.79	654.86
Non-recyclable	0.4442	0.3710	0.3305	0.44	0.09	2.61	953.58
Recyclable	0.4563	0.2154	0.5477	0.56	0.11	3.36	1224.74
Special Waste	0.0814	0.0337	0.0221	0.22	0.04	1.31	478.91
Total	**1.2238**	**0.8936**	**1.0724**	**1.51**	**0.30**	**9.07**	**3312.09**
Middle Income							
Biodegradable	0.3792	0.3274	0.3349	0.44	0.09	2.67	973.69
Non-recyclable	0.3160	0.3668	0.3053	0.37	0.07	2.20	803.15
Recyclable	0.2166	0.1683	0.1556	0.30	0.06	1.77	646.94
Special Waste	0.0319	0.0227	0.0495	0.27	0.05	1.64	598.53
Total	**0.9437**	**0.8852**	**0.8453**	**1.38**	**0.28**	**8.28**	**3022.30**
Low Income							
Biodegradable	0.1983	0.1820	0.3613	0.32	0.06	1.90	691.89
Non-recyclable	0.3188	0.2401	0.2539	0.37	0.07	2.23	813.35
Recyclable	0.1671	0.1757	0.1405	0.24	0.05	1.44	525.03
Special Waste	0.0243	0.0034	0.0087	0.28	0.06	1.68	614.54
Total	**0.7085**	**0.6012**	**0.7644**	**1.21**	**0.24**	**7.25**	**2644.80**

Non-household. Non-household sector comprises the food establishments, general stores, institutions, hotels/inns/pension house, service centers, industries, health clinics/ centers, and hospitals, and wet markets. The results show that the general stores have the highest percentage (44.12%) of the total waste generated in Butuan City with 143,633.763kg of solid wastes per day. This is followed by household waste generators which contribute 39.25% of the total wastes127,779.356 kg per day, while food establishments come as the third highest contributor (6.84%) with 22,267.791kg of wastes per day. Institutions, whether private or public, comprised the 0.63% of the total amount of wastes. Further, health establishments (clinics/ health centers and hospitals) contributed 0.36% of the total amount of wastes generated, while wet markets generated 2.90% of the total wastes in the City. Lastly, hotels/inns, service centers and industries generated the 2.17%, 3.12% and 0.60%, respectively, of total amount of solid wastes. Overall non-household has a total of 197,773.14kg per day of solid wastes generated from different sectors in Butuan City (WACS, 2019).

Table 38. Amount of waste generated (in kg/day) from different sectors in Butuan City.

Source of Waste	Amount of Waste Per Capita (kg/day)	Total amount of waste (kg/day)	% contribution
Non-Household			
Food Establishment	10.0692	22,267.791	6.84
General Store	19.0294	143,633.763	44.12
Institution	1.6278	2,050.981	0.63
Hotel/Inn/Pension House	9.4310	7,064.489	2.17
Service Center	3.0655	10,157.238	3.12
Industries	1.6933	1,953.315	0.60
Health Establishment:			

Rural/Barangay Health Center/ Clinic	0.0979	32.555	0.01
Hospitals	87.7592	1,139.434	0.35
Public Market:			
Micro (Talipapa)	20.9821	162.776	0.05
Mid-sized	216.3371	813.881	0.25
Big	4547.2517	8,464.365	2.60
Household	0.2706	127,779.356	39.25
	Total	**325,552.5**	**100.00**

Source WACS 2019

Total waste generated in the city was calculated by adding the total household waste and non-household waste with a total of approximately **325,552.5** kg/day.

4.2 Waste diversion

Based on the 2010 ESWM Plan projection, the city diverted 30% of the total waste generated. Therefore, it is projected that the waste diversion in 2020 is 76.08% and targeted to reach 95-100% by the year 2029 upon operation of Waste to Energy Facility. Table 39 shows the city's 10-year waste diversion targets (WACS, 2019).

Table 39. 10-year waste diversion targets of Butuan City.

Year	Projected population	Daily waste generation based on population (kg/day)	Target waste diversion (%)	Weight diverted & to be diverted (kg/day)	Target waste disposal (%)	Target weight to disposal (kg/day)	WACS (kg/day)								
							Biodegradables		Recyclables		Residuals				Special
											RWPD		For Disposal		
							54.21%		16.01%		22.05%				7.73 %
2020	472,500	325,552.50	76.08	247,680.34	23.92	77,872.16	176,482.01	54.21 %	52,120.96	16.01 %	19,077.38	5.86%	52,706.95	16.19 %	25,165.21
2021	482,253	332,272.32	77.08	256,115.50	22.92	76,156.82	180,124.82	54.21 %	53,196.80	16.01 %	22,793.88	6.86%	50,472.16	15.19 %	25,684.65
2022	492,205	339,129.25	78.08	264,792.11	21.92	74,337.13	183,841.96	54.21 %	54,294.59	16.01 %	26,655.56	7.86%	48,122.44	14.19 %	26,214.69
2023	502,360	346,126.04	80.08	277,177.73	19.92	68,948.31	187,634.93	54.21 %	55,414.78	16.01 %	34,128.03	9.86%	42,192.76	12.19 %	26,755.54
2024	512,724	353,266.84	82.08	289,961.42	17.92	63,305.42	191,505.95	54.21 %	56,558.02	16.01 %	41,897.45	11.86 %	35,997.89	10.19 %	27,307.53
2025	522,631	360,092.76	84.08	302,765.99	15.92	57,326.77	195,206.28	54.21 %	57,650.85	16.01 %	49,908.86	12.86 %	33,092.52	9.19 %	27835.17
2026	532,728	367,049.59	86.08	315,956.29	13.92	51,093.30	198,977.58	54.21 %	58,764.64	16.01 %	61,884.56	13.86 %	30,061.36	8.19 %	28372.93
2027	543,018	374,139.40	88.08	329,541.99	11.92	44,597.42	202,820.97	54.21 %	59,899.72	16.01 %	66,821.30	14.86 %	26,900.62	7.19 %	28920.98
2028	553,505	381,364.95	90.08	343,533.54	9.92	37,831.40	206,737.94	54.21 %	61,056.53	16.01 %	75,739.08	15.86 %	23,606.49	6.19 %	29479.51
2029	564,193	388,728.98	95.00	369,292.53	5.00	19,436.45	210,729.98	54.21 %	62,235.51	16.01 %	85,714.74	17.05 %	19,436.45	5.00 %	30048.75

4.3 Generated Waste

Waste segregation and generation. Waste generation average for the city of Butuan (household + non-household) is**0.689 kg/capita/day**. This corresponds to biodegradable waste (0.3737kg/capita/day), non- recyclable (0.1520 kg/capita/day), recyclable (0.1103kg/capita/day), and special waste (0.0532kg/capita/day). (WACS, 2019).

Non-household waste generators were further classified according to the following Classification: food establishment, general stores, institution, hotels/inn/pension house, service centers and industries. Approximately 10.0692kg per capita per day of waste is generated from food establishment, 19.0294 kg per capita per day from general store, 1.6278 kg per capita per day from institution, 9.4310 kg per capita per day from hotel/inn/pension house, 3.0655 kg per capita per day from service center, 1.6933 kg per capita per day from industries, health establishment comprise of barangay health/clinic/center which is 0.0979 kg per capita per day of waste generated and 87.7592 kg per capita per day from hospital, Public market comprise of micro (talipapa) which 20.9821 kg per capita per day of waste generated, mid-sized 216.3371 kg per capita per day of waste generated and big which is 4547.2517 kg per capita per day of waste generated (WACS, 2019).

Based on WACS (2019) the total waste generated per day from all sectors is 325,552.5kilograms which translates to biodegradable waste (**54.21%**), residual waste (**22.05%),** recyclable waste (**16.01%)** and special waste (**7.73%).**

Table 40. Summary of the amount of waste generated (in kg/day) based on the classification per source of waste/sector in Butuan City.

Classification	Source of Waste	Total amount of waste (kg/day)	% contribution
Commercial	Food Establishment General Store Public Market Hotel/Inn/Pension House Service Center	192,596.86	59.16
Institutional	Institution Health Institution	3,222.97	0.99
Industrial	Industries	1,953.32	0.60
Residential	Household	127,779.356	39.25
TOTAL		**325,552.5**	**100**

Source: WACS, 2019.

Projection of the wastes generated for the next 10 years was estimated based on the assumption that there will be no intervention from the LGU and other organizations. Likewise, the projection was simulated based on the available population data from PSA. As shown in Table 39 and Table 47 there is a continuous increase in the volume of wastes that will be generated. Among all waste categories, it is being projected that there will be more of the recyclable wastes to be generated followed by the biodegradable, non-recyclable and the special wastes (WACS, 2019)

CHAPTER – V
LEGAL/INSTITUTIONAL FRAMEWORK

5.1 Local Laws and Regulation

Apart from existing national environmental laws and issuances, the City Government of Butuan is currently implementing local policies and ordinances pertaining to solid waste management. In addition, barangay councils are enjoined and encouraged to formulate and implement their barangay solid waste management plan (BSWMP). *Table 41* shows the various policies and ordinances that are currently implemented in Butuan City.

Table 41.Implemented environmental and SWM policies in Butuan City.

LOCAL LAWS/REGULATIONS	TITLE/DESCRIPTION
SP Ordinances	
SP Ordinance No. 1052 – 94	An ordinance prescribing and penalizing certain acts and/ omissions inimical to cleanliness and sanitation and for other purposes.
SP Ordinance No. 2123 – 97	An ordinance prescribing guidelines for the prevention, control and abatement of air pollution from motor vehicles within Butuan City, imposing penalties for violation thereof, and for other purposes
SP Ordinance No. 2330 – 2001	Creation of the Butuan City Ecological Solid Waste Management Board
SP Ordinance No. 2380 – 2002	Development of an ESWM Plan/Program
SP Ordinance No. 2385 – 2002	Requiring operators and/or owners of commercial and industrial establishments to undergo a seminar on ESWM prior to the issuance of business permits and license to operate
SP Ordinance No. 3589 – 2010	Butuan City Solid Waste Management Code
SP Ordinance No. 3617-2010	Environment Code of Butuan City
SP Ordinance No. 4407 – 2014	An ordinance regulating the use, sale, distribution and advertisement cigarettes and other tobacco products in certain places, imposing penalties for violations thereof and providing funds therefor, and for other purposes.
SP Ordinance No. 4679 – 2015	An ordinance establishing a septage management system in the City of Butuan

SP Ordinance No. 5064 – 2016	Prohibiting the use of plastic bags and Styrofoam as packaging materials on selected wet goods and dry goods.
SP Ordinance No. 5334 – 2017	An ordinance regulating the use of plastics and plastics by-products in Butuan City, Prescribing Penalties for violation therefore, repealing for this purpose SP ordinance No. 5064-2016, and other for other purposes
SP Ordinance No. 5445 – 2017	An ordinance imposing penalties for illegal dumping of voluminous, bulky, and hazardous wastes in public and private places within the City of Butuan, and for other purposes.
Executive Orders	
Executive Order No. 39 – 2010	Waste segregation at source and segregated waste collection mechanisms
Executive Order No. 161 – 2007	Establishment of residual waste collection points in the barangays and the mandatory construction of compost pits in the household level.
Executive Order No. 191 – 2016	Implementation of waste segregation and reduction at source. The EO also pertains to the establishment and operationalization of MRFs in the barangay level.
Executive Order No. 23 – 2017	Reconstitution of the Butuan City Ecological Solid Waste Management Board

Source: Sangguniang Panlungsod (SP), Butuan City

Existing City ordinances pertaining to Environment Protection are reviewed simultaneously and amended if necessary. In addition, close coordination with the Sangguniang Panlungsod shall be strengthened to ensure efficient implementation of such ordinances. Every Barangay Council are required to update and/or formulate their respective Barangay SWM plans and policies as well.

Enforcement and Compliance. R.A. 9003 and related local ordinances are being enforced in the entire City. The Enforcement and Regulation Division of the Butuan City ENRO, is currently implementing a 2-Phase Strategy in its implementation. Massive Information, Education and Communication (IEC) activities (e.g. seminars, lectures, workshops, etc.) are being conducted in the clustered barangays in a quarterly manner. IEC activities covered the different stakeholders of the City (e.g. households, commercial establishments, industries, government offices, schools and universities, public markets, etc.).

Meanwhile, an enforcement team composed of eight (8) members were distributed evenly to the four (4) clustered barangays. The team basically inspects and monitor the compliance of all stakeholders to the different national policies, local ordinances and issuances. Each enforcer was issued with valid citation tickets to facilitate proper enforcement. Subsequently, EPPD issues Environmental Clearance and attendance to Environmental Seminar as conditions stipulated prior issuance of Business Permit.

Furthermore, the Ecological Solid Waste Management Division (ESWMD) developed a mechanism for an efficient and effective waste collection system within the City. Only residuals and special wastes are being catered. Subsequently, the Sanitary Landfill Facility (SLF) in Barangay Dumalagan is already undergoing major renovations and rehabilitation to comply with the requirements of the ECC. Moreover, there are eighty-one (81) employees under the City Parks and Waterways Division (CPSD) in charge of maintaining the cleanliness of streets within the City.

5.2 Roles

As provided by RA 9003 and Executive Order No. 23 series of 2017, the Butuan City Ecological Solid Waste Management Board is tasked to formulate plans and policies as regards to the solid waste management program of the city and approved by the CityMayor.

The City Government of Butuan, through the Sangguniang Panlungsod is also mandated to enact laws and ordinances consistent with the priorities identified by the BCESWMB. The CityMayor as head of the city shall execute and implement programs and projects relative to solid waste management.

The Barangay Councils through its respective Committee on Environment is also mandated to formulate and implement a Barangay Solid Waste Management Committee responsible to prepare plans and programs pertaining to proper implementation of waste collection and other related ordinances and laws.

All SWM stakeholders whether private entity, institution, citizens, NGOs and recycling companies are empowered and encouraged to get involved in the city government's efforts in the proper implementation of solid wastes management program. Their active participation and inputs in the SWM plan formulation are also ensured.

5.3 Reconstitution of the Butuan City ESWMB and SWM-TWG

Pursuant to Section 12 of RA 9003 otherwise known as the "Ecological Solid Waste Management Act of 2000" and Rule VI, Section 1 of its corresponding Implementing Rules and Regulations (IRR), the City Government of Butuan with its commitment to minimize and prevent the illegal disposal of all types of waste generated within its jurisdiction and reduce the environmental risks and public health hazards associated with it recognized the urgent need to reconstitute, create and convene the Butuan City Ecological Solid Waste Management Board (BCESWMB) was reconstituted through EO No. 23 series of 2017. The Board consists of representatives from the concerned city government offices, different regional-line agencies, NGOs, Academe and other stakeholders. Table 42 shows the composition of the BCESWMB.

Table 42. The BCESWMB members.

OFFICES/ORGANIZATIONS	POSITION
City Mayor	Chairman
SP Chairman, Committee on Environment and Natural Resources	Vice Chairman
ESWMD, City ENRO	Secretariat
President, LIGA ng mga Punong Barangay	Member
Chairman, SK Federation	Member
Representative, Environmental NGO accredited by the SP	Member
City Health Officer	Member
City Planning and Development Coordinator	Member
City Engineer	Member
City Agriculturist	Member
RD or authorized permanent representative, DENR-EMB	Member
RD or authorized permanent representative, DTI-Caraga	Member
RD or authorized permanent representative, DepEd	Member
RD or authorized permanent representative, CHED	Member
RD or authorized permanent representative, TESDA	Member
Representative, Recycling Industry	Member
Representative, Manufacturing and Packaging Industry	Member
Representative, Butuan City Police Office	Member

The duties and responsibilities of the BCESWM Board as provided by RA 9003 and enhanced by Executive Order No. 23 series of 2017 are as follows:

a. Develop a comprehensive, integrated and sustainable City Solid Waste Management Plan (CSWMP);

b. Integrate the best solid waste management programs (SWMP), practices and strategies implemented by the various component barangays in the development of the CSWMP;

c. Adopt measures to promote and ensure the viability and effective implementation of the SWMP in all component barangays;

d. Monitor the implementation of the CSWMP in coordination with the component barangays and concerned non-government organizations (NGOs);

e. Adopt specific income-generating measures to promote the viability of the SWMP;

f. Oversee the implementation and enforcement of the CSWMP;

g. Convene regular meetings for purposes of planning, coordination and reporting of the status on the implementation of the CSWMP;

h. Review every two (2) years or as need arises, the CSWMP for purposes of ensuring its effectiveness, sustainability and significance in relation to local and international developments in the field of SWM;

i. Develop specific mechanisms and guidelines for the effective implementation of the CSWMP;

j. Recommend to appropriate local government authorities' specific measures or proposals for a franchise or build-operate-transfer agreement with duly-recognized institutions, pursuant to RA 6957, to provide either exclusive or non-exclusive authority for the collection, storage, processing, recycling and disposal of

City solid wastes. The proposals shall take into consideration appropriate government rules and regulations on contracts, franchises and build-operate-transfer agreements.

k. Provide the necessary logistical and operational support to component barangays in consonance with subsection (f) of Section 17 of RA 7160 or the Local Government Code of 1991.

l. Recommend measures and safeguards against pollution and for the preservation, conservation and rehabilitation of the natural ecosystem;

m. Coordinate the efforts of component barangays in the implementation of the CSWMP; and

n. Call on any agency or sector, as may deem necessary, for support and/or other appropriate action.

Table 43.Butuan City ESWM Board list of activities.

ACTIVITY	SCHEDULE	REMARKS
1. Review and approval of the 10-year ESWM Plan	Every 5 years or as needs arise	City ENRO ESWM Division as secretariat. ESMWB endorse the 10 year SWM Plan
2. Review on the implementation of SWMP	Every 2 years or as needs arise	City ENRO environmental protection and Planning Division review and revise the existing ESWM plan
3. ESWMB Meeting	Quarterly	The reconstitution of the board member just approved last 15 August 2017

5.4 Barangay Solid Waste Management Committees

Pursuant to the provisions of RA 9003, all barangays are required to create their Barangay ESWM Council. Table 44 shows the composition of the Barangay ESWM Committee

Table 44. Composition of the Barangay ESWM Committee.

COMPOSITION	POSITION
Punong Barangay	CHAIRMAN
Kagawad on Environmental Protection	MEMBER
SK Chairman	MEMBER
President, Home Owner's Association	MEMBER
Representative, DepEd	MEMBER
Representative, Religious Sector	MEMBER
Representative, Business Sector	MEMBER
Representative, NGO	MEMBER

Table 45. Barangay ESWM Committees in Butuan City.

BARANGAY	DATE ORGANIZED	BARANGAY RESOLUTION NO.	SCHEDULE OF MEETING
Urban Barangay			
1. Maon	5/28/14	*	As need arise
2. Golden Ribbon	6/30/14	030-2013	As need arise
3. Agao	1/29/14	29 s 2014	As need arise
4. Rajah Soliman	5/26/14	*	As need arise
5. Datu Silongan	7/13/14	039-14	As need arise
6. Diego Silang	4/25/14	*	As need arise
7. Dagohoy	6/20/14	16-s14	As need arise
8. Lapu-Lapu	1/30/14	18-s14	As need arise
9. Urduja	1/27/14	*	As need arise
10. Sikatuna	3/28/14	*	As need arise
11. Humabon	8/04/14	*	As need arise
13. Tandang Sora	7/24/14	91	As need arise
13. Leon kilat	3/7/14	*	As need arise
14. Limaha	2/21/14	017-2014	As need arise
15. San Ignacio	3/31/14	051-14	As need arise
16. Ong yiu	2/27/14	09	As need arise
17. Fort Poyohon	3/18/14	*	As need arise
18. Obrero	8/13/14	99-2014	As need arise
19. Buhangin	3/28/14	41-2014	As need arise
20. Baan Riverside	3/11/14	058-2014	As need arise
21. Mahogany	3/20/14	32A	As need arise
22. Bading	8/4/14	06-2015	As need arise
23. Holy Redeemer	7/22/14	*	As need arise
24. Imadejas	2/2/14	*	As need arise
25. JP Rizal	6/6/14	0916-14	As need arise
26. New Society	7/26/14	*	As need arise
27. Bayanihan	8/6/14	*	As need arise
Rural Barangay			
28. Agusan Pequeno	8/7/14	019-2016	As need arise
29. Ambago	5/31/14	0058	As need arise
30. Amparo	6/9/14	*	As need arise
31. Ampayon	8/11/14	*	As need arise
32. Anticala	9/2/14	42	As need arise
33. Antongalon	2/20/14	041	As need arise
34. Aupagan	3/18/14	*	As need arise
35. Baan Km3	8/18/14	88	As need arise
36. Babag	6/3/14	33 s 2014	As need arise
37. Bancasi	1/22/14	059	As need arise
38. Banza	3/12/14	MC 2001-38	As need arise
39. Baobaoan	2/20/14	008-2014	As need arise
40. Basag	2/28/14	29-2014	As need arise
41. Bilay	8/28/14	068-2014	As need arise
42. Bitan-agan	6/9/14	62-2014	As need arise

43. Bit.os	2/20/14	S24	As need arise
44. Bobon	5/30/14	105-2014	As need arise
45. Bonbon	1/24/14	1701	As need arise
46. Bugsukan	1/12/14	019-2014	As need arise
47. Cabcabon	1/30/14	042	As need arise
48. Camayahan	*	*	As need arise
49. Dankias	3/10/14	E.O 366	As need arise
50. De Oro	2/17/14	21 s 2014	As need arise
51. Don Francisco	4/3/14	*	As need arise
52. Doongan	5/27/14	02-038-14	As need arise
53. Dulag	2/7/14	2001-36	As need arise
54. Dumalagan	2/18/14	MC 38-2001	As need arise
55. Florida	2/6/14	031-s2013	As need arise
56. Kinamlutan	6/3/14	38-2014	As need arise
57. Lemon	6/3/14	050-2014	As need arise
58. Libertad	6/26/14	*	As need arise
59. Los Angeles	2/12/14	MC 2001-3B	As need arise
60. Lumbocan	2/17/14	MC 2012-121	As need arise
61. Maguinda	2/28/14	RN 19-2014	As need arise
62. Mahay	3/14/14	*	As need arise
63. Maibu	1/28/14	*	As need arise
64. Mandamo	2/12/14	16	As need arise
65. Manila de Bugabus	2/6/14	049	As need arise
66. MJ Santos	*	*	As need arise
67. Masao	4/1/14	MC 2001-38	As need arise
68. Maug	4/21/14	RN 012-2014	As need arise
69. Nongnong	3/18/14	RN 47-2014	As need arise
70. Pagatpatan	2/8/14	05-2014	As need arise
71. Pangabugan	2/20/14	RN 11 s 2014	As need arise
72. Pianing	6/27/14	48 s 2014	As need arise
73. Pigdaulan	6/3/14	91 s 2014	As need arise
74. Pinamangculan	1/27/14	21 s 2014	As need arise
75. Salvacion	8/6/14	*	As need arise
76. San Mateo	2/5/14	88-2014	As need arise
77. San Vicente	3/16/14	*	As need arise
78. Santo Nino	3/3/14	13 s 2014	As need arise
79. Sumile	7/25/14	*	As need arise
80. Sumilihon	8/6/14	172-2013	As need arise
81. Tagabaca	6/3/14	05-2014	As need arise
82. Taguibo	2/6/14	012	As need arise
83. Taligaman	8/6/14	*	As need arise
84. Tiniwisan	7/23/14	*	As need arise
85. Tungao	6/19/2014	74 s 2014	As need arise
86. Villa Kananga	2/14/14	011 s 2014	As need arise

- *No existing SP/ Barangay Resolution*

5.5 Stakeholders Participation

Consultation meetings and conferences are regularly held involving all stakeholders. They are allowed to share ideas as additional inputs for an effective ESWM Plan formulation. In order to assure the sustainability of the ESWM Plan and its corresponding programs, the participation of the different stakeholders from conceptualization up to actual monitoring is required. Stakeholder participation would ensure accountability, transparency, social justice and equity. Table 46 shows the various activities conducted involving the different stakeholders pertaining to ESWMP.

Table 46. ESWM activities participated by different stakeholders.

ORGANIZATION	ACTIVITIES	YEAR OF IMPLEMENTATION
1. 44 Service Barangay	Seminar/Workshop of Brgy. MRF.	2020 – 2029
2. 86 Barangay	Training and Seminar in relation to the implantation of SWM. Training on Bio Composting and Agricultural Technology	2020 – 2029
3. High School, Colleges, Universities	Orientation Seminar on Solid Waste Management (SWM)	2020 – 2029
4. 4 P's and other Indigent people	Orientation Seminar on Solid Waste Management (SWM)	2020 – 2029
5. CFFI/NGO	Orientation Seminar on Solid Waste Management (SWM)	2020 – 2029
6. Butuan City Water District, Tourism Office and Senior Citizen	Orientation Seminar on Solid Waste Management (SWM)	2020 – 2029
7. Transport Group	Orientation Seminar on Solid Waste Management (SWM)	2020 – 2029
8. NGO/BLGU	Deputation Seminar of Barangay Bantay Kahinlo Brigade Volunteers (BBKBV)	2020 – 2029

CHAPTER – VI
PLAN STRATEGY

6.1 Vision

The updated 10-year ESWM Plan is consistent with Section 16 of the 1987 Philippine Constitution, emphasizing the need to develop SWM strategies that will not only ensure the quality of life of all stakeholders but also preserve the integrity of our ecological systems. The vision and mission statements are as follows:

> *"Vision: By 2029, The City of Butuan is a model in implementing an efficient and sustainable Solid Waste Management System with capacitated constituents in achieving a clean and green environment."*

> *"Mission: To develop and implement a sustainable Solid Waste Management Program that institutionalizes an integrated and effective Solid Waste Management practices in Butuan City."*

Butuan City, being an HUC and as capital of Caraga Region, would like to take the lead in implementing a smart, science-based and people-oriented mechanisms in resolving the solid waste problem. The City Government of Butuan deemed it necessary to apply and integrate waste conversion and processing technologies in the implementation of RA 9003. Available innovations such as waste-to-energy (WTE) will pave way to a more efficient and cleaner SWM program.

Goal. Attainment of approximately 95-100% waste diversion rate by 2029.

Notwithstanding the specific outcomes that had been already achieved in the previous plan, there were identified areas that need modification and improvement. The specific targets and strategies that were developed in this ISWMP were based primarily on the results and findings of the existing WACS. The delineation of specific outcome is anchored on the major goals of RA 9003. Generally, the 10-year ISWM Plan of Butuan City aims to provide SWM strategies, guidelines and protocols pertaining to:

(1) the attainment of maximum waste diversion using efficient alternative technologies;
(2) effective monitoring and evaluation of segregation at source;
(3) efficient waste collection and modernized disposal management system;
(4) the strengthening of the law enforcement mechanisms; and
(5) the promotion of social justice and equity through stakeholders' participation.

6.2 Targets

Waste diversion. Based on the 2010 ESWM Plan projection, the city diverted 30% of the total waste generated. Therefore, it is projected that the waste diversion in 2020 is 76.08% and is expected to reach 95-100% by the year 2029. In addition, the City Government of Butuan is planning to adapt alternative technology that addresses gaps and issues on solid waste management such as construction of sorting, recycling and processing plant which helps achieve the target waste diversion.

Table 47 shows the City's 10-year waste diversion targets of Butuan City.

Table 47. 10-year waste diversion targets of Butuan City

Year	Projected population	Daily waste generation based on population (kg/day)	Target waste diversion (%)	Weight diverted & to be diverted (kg/day)	Target waste disposal (%)	Target weight to disposal (kg/day)	WACS (kg/day)								
							Biodegradables		Recyclables		Residuals				Special
											RWPD		For Disposal		
							54.21%		**16.01%**		**22.05%**				**7.73 %**
2020	472,500	325,552.50	76.08	247,680.34	23.92	77,872.16	176,482.01	54.21 %	52,120.96	16.01 %	19,077.38	5.86%	52,706.95	16.19 %	25,165.21
2021	482,253	332,272.32	77.08	256,115.50	22.92	76,156.82	180,124.82	54.21 %	53,196.80	16.01 %	22,793.88	6.86%	50,472.16	15.19 %	25,684.65
2022	492,205	339,129.25	78.08	264,792.11	21.92	74,337.13	183,841.96	54.21 %	54,294.59	16.01 %	26,655.56	7.86%	48,122.44	14.19 %	26,214.69
2023	502,360	346,126.04	80.08	277,177.73	19.92	68,948.31	187,634.93	54.21 %	55,414.78	16.01 %	34,128.03	9.86%	42,192.76	12.19 %	26,755.54
2024	512,724	353,266.84	82.08	289,961.42	17.92	63,305.42	191,505.95	54.21 %	56,558.02	16.01 %	41,897.45	11.86 %	35,997.89	10.19 %	27,307.53
2025	522,631	360,092.76	84.08	302,765.99	15.92	57,326.77	195,206.28	54.21 %	57,650.85	16.01 %	49,908.86	12.86 %	33,092.52	9.19 %	27835.17
2026	532,728	367,049.59	86.08	315,956.29	13.92	51,093.30	198,977.58	54.21 %	58,764.64	16.01 %	61,884.56	13.86 %	30,061.36	8.19 %	28372.93
2027	543,018	374,139.40	88.08	329,541.99	11.92	44,597.42	202,820.97	54.21 %	59,899.72	16.01 %	66,821.30	14.86 %	26,900.62	7.19 %	28920.98
2028	553,505	381,364.95	90.08	343,533.54	9.92	37,831.40	206,737.94	54.21 %	61,056.53	16.01 %	75,739.08	15.86 %	23,606.49	6.19 %	29479.51
2029	564,193	388,728.98	95.00	369,292.53	5.00	19,436.45	210,729.98	54.21 %	62,235.51	16.01 %	85,714.74	17.05 %	19,436.45	5.00 %	30048.75

6.3 Strategies

The City Government shall implement the following programs with four (4) major strategies, to wit:

1. Waste Diversion

- Conduct Feasibility Study onEcological Solid Waste Processing Compliant Facility and Waste-to-Energy Processing Plant
- Construction of Integrated Solid Waste Facility (Sorting and Recycling)
- Construction of Waste-to-Energy Plant
- Establishment of 3 Clustered composting and Material Recovery Facilities
- Establishment of Centralized Material Recovery Facility
- Construction of Solid Waste Integrated Sorting & Recycling Plant
- Provision of solid waste equipment to clustered MRFs

2. Collection and Disposal

- Acquisition of Garbage trucks

3. IEC

- Strengthen the conduct of Communication, Education and Public Awareness (CEPA) particularly on proper solid waste management, segregation, re-use, recycle, reduce, refuse and composting in the residential, commercial, institutions, industrial establishment.
- Provision of visual aids, posters at strategic locations: Barangay Bulletins, Public LEDs, Schools and Overpasses.

4. Enforcement

- Intensify enforcement of existing ordinances governing solid waste management of Butuan City
- Strengthen partnership with BLGU
- Standardize garbage collection fees
- Impose penalties and incentives

Waste collection. The City Government of Butuan in accordance to RA 9003 launches the Solid Waste Management initiative on the "No Segregation No Collection Policy" following the Local Executive Order 191, series of 2016 that directs all Punong Barangays to strictly implement the waste segregation and reduction at source, and operationalization of the Barangay Materials Recovery Facility (MRF). This was reinforced by the Memorandum Order No. 111, series of 2016, mandated that the residual/special wastes will be collected only from the designated barangay MRFs/pick-up points/stations. Each barangay decides on and implements its own set of rules and schedule for the collection of waste in its territory. RA 9003 stipulated in Sec. 17.c that the barangay shall be responsible for ensuring a 100% collection efficiency from residential, commercial, industrial, and agricultural resources within its area of coverage (WACS, 2019).

In addition, to address the gaps and issues it is deemed necessary to the formulation of cost-effective routes schedule for collection and increase frequency on its schedule. Also, the expansion of collection services to 86 barangays and procurement of additional garbage collection vehicle/equipment to facilitate efficient collection.

Waste disposal. The previous open dumpsites shall be properly closed and disinfected like Brgy. Dulag dumpsite was closed on August of 2016 and Brgy. Doongan dumpsite was closed on April 2012 and now undergoing safe closure and rehabilitation. On October 1, 2016, the Sanitary Landfill Facility (SLF) located in Barangay Dumalagan became operational in accordance with the guidelines prescribed by the DENR-EMB. Mixed wastes are not allowed to be disposed in the facility. Subsequently, waste scavengers and informal recyclers are strictly prohibited from entering the SLF.

All 45-serviced barangays will be clustered and a centralized composting area will be identified and established for each of the 3 clusters starting 2021. In addition, 3 clustered composting facilities will be provided support equipment and facilities such as compactors, etc. All biodegradable wastes will be collected and redirected to the central composting facilities of each clusters by 2022.

Figure 18. Waste compactors to be provided at the clustered MRFs

Materials recovery and processing. Aside from the existing MRFs in the barangays, a centralized MRF will be constructed within the year 2021 and 2022. In addition, part of the design of the centralized MRF will be the area intended for waste to bioenergy conversion and a storage facility for reusable and recyclable wastes.

Meanwhile, the composting centers and MRFs for each cluster will adopt technologies that will accelerate the degradation of biodegradable wastes (e.g. vermicomposting, bioreactors, etc) as well as equipment such as Compactors, while the centralized MRF will be provided with Bottle Crusher, Plastic Shredder, and Glass Pulverizer. Efforts pertaining to converting waste products into cash and/or livelihood will be highly encouraged and promoted in the barangay level.

Figure 19. Bottle Crusher to be installed at the Centralized MRF

Figure 20.Plastic Shredder to be installed at the Centralized MRF.

Further, construction of Integrated Solid Waste Sorting, Recycling and Processing Plant will support the target of the city to divert wastes which helps achieve 95-100% waste diversion by 2029.

Information, Education and Communication (IEC). Several households are still not practicing solid waste management activities which has corresponding percentages per WACS Result, Segregation (2.11), Recycling (29.7), Reusing (16.16), Composting (38.64) Dropping waste at MRF (48.71). For effective implementation and to achieve less percentage it is deem necessary to develop and enhance mode of raising awareness towards stakeholders.

One activity is to strengthen the conduct of Communication, Education and Public Awareness (CEPA) on proper solid waste management, segregation, re-use, recycle, reduce, refuse and composting in the residential, commercial, institutions, industrial establishment. Another is the provision of visual aids, posters at strategic locations such as Barangay Bulletins, Public LEDs, Schools and Overpasses.

To intensify the campaign of reducing wastes specifically plastics and plastic by-products, strict implementation of SP Ordinance No. 5334-2017 “Plastic Regulation Ordinance” will be conducted. Subsequently, mandatory provision and utilization of

eco-bags in business and commercial establishments within the City will be implemented and closely monitored. In addition, additional SWM enforcers in the City and Barangay level will be trained, hired and deputized. Moreover, IEC activities such as but not limited to forum, symposium and seminars will be conducted, and information materials pertaining to waste segregation, composting, recycling and environmental conservation will be developed and distributed.

The Barangay Bantay Kahinlo Brigade Volunteers (BKBV) will be organized, trained and will be deputized as SWM enforcers. Meanwhile, in order to closely evaluate the compliance of each barangays and partner agencies on the provisions of RA 9003 and EO 191 s2017, an ESWM evaluation instrument will be developed, pilot-tested and legitimized by the end of 2017.

Evaluation and Monitoring. A comprehensive ESWM Compliance Evaluation instrument will be developed, pilot-tested and legitimized in the last quarter of 2017. Results of the said evaluation will be the basis for the ESWM Plan modification and monitoring.

Alternative analysis. Aside from the barangay MRFs intended for the segregation, sorting and marketing of recyclable and reusable wastes, the City Government of Butuan is exploring the establishment of clustered MRF and composting facility for the processing of biodegradable wastes in the barangay level. In addition, the City Government and other agencies is also developing the feasibility study for the propose sanitary landfill facility and installed with a waste converter equipment for the processing and conversion of residual and plastic wastes into energy source. Further, household sector is willing to pay an average amount of Php 19.27 per household per month, while the non-household and market sectors are willing to pay an amount of Php 131.24 and Php 55.70, respectively, for every kilogram of wastes for disposal from a certain establishment.

Table 48.Solid Waste Management Program in Barangays along Coastal Areas or Tourist Destination.

Barangay	Classification	SWM Program
Masao	Coastal	Conduct Coastal Clean-up drive activity and tree/mangrove plantig activity. Information, Education and Communication (IEC) on Solid Waste Management and related governing laws. Distribution of leaflets and brochure materials to stakeholders. Conduct Environmental Awareness seminar on Air,
Lumbucan	Coastal	

		Noise, Land Based Pollution Seminar to commercial, industrial establishments Deploy enforcement team to conduct monitoring and surveillance on illegal dumping, littering and other related activities.

CHAPTER – VII
SOLID WASTE MANAGEMENT SYSTEM

7.1 Source Reduction

Waste reduction at source should be promoted to major waste generators such as but not limited to public markets, commercial and business areas, institutions and agencies, schools, and households. Table 49 shows the programs and interventions promoting and intensifying waste reduction.

Table 49. Programs and interventions for waste reduction.

Source of Waste	Waste Reduction Scheme/Ordinance	Materials to be Addressed	Implementation Schedule	Target Sectors
Barangays	• Provide technical assistance in implementation of ESWM Ordinances and other governing laws. • Imposing penalties for illegal dumping in public areas. • Conduct SWM Seminar and other ordinances and issuances.	• Plastic and Plastic by-products • Voluminous, bulky, and hazardous wastes	CY 2020	Barangay Officials, employees and constituents
Public Market	• Regulation on the use of plastics and plastic by-products in the market. • Encourage the use of Eco-Bags both supplier and consumer • Impose penalties for illegal dumping and anti-littering.	• Plastic and Plastic by-products • Plastic bags • Voluminous, bulky, and hazardous wastes	CY 2020	Market Vendors Associations

	• Conduct SWM Seminar and other ordinances and issuances. • Intensify enforcement on ESWM Ordinance and other governing laws			
Commercial Establishment	• Regulation on the use of plastics and plastic by-products. • Encourage the use of Eco-Bags and biodegradable packaging materials. • Impose penalties for illegal dumping and anti-littering. • Intensify enforcement on ESWM Ordinance and other governing laws • Conduct SWM Seminar and other ordinances and issuances.	• Plastic and Plastic by-products • Plastic bags • Voluminous, bulky, and hazardous wastes	CY 2020	Business Owners
Institutions and Agencies	• Intensify enforcement on ESWM Ordinances and other governing laws • Regulation on the use of plastics and plastic by-products.	• Plastic and Plastic by-products • Plastic bags	CY 2020	Hospitals, Schools, NGOs, NGAs

	• Impose penalties for illegal dumping and anti-littering. • Encourage Schools in the implementation of Provide-your-own-utensils (PYOU). • Conduct SWM Seminar and other ordinances and issuances.	• Voluminous, bulky, and hazardous wastes		
Households	• Intensify enforcement on ESWM Ordinances and other governing laws • Conduct/ Conduct SWM Seminar and other ordinances and issuances. • Encourage the Recycling program	• Voluminous, bulky, and hazardous wastes • Plastic bags • Waste materials	CY 2020	All families and other household members

7.2 Collection

All constituent barangays are responsible for the collection of segregated residual and biodegradable wastes in their respective Area of Responsibility (AOR); but only residual waste will be disposed at the Sanitary Landfill Facility. Figure 21 shows the flow of waste collection within Butuan City.

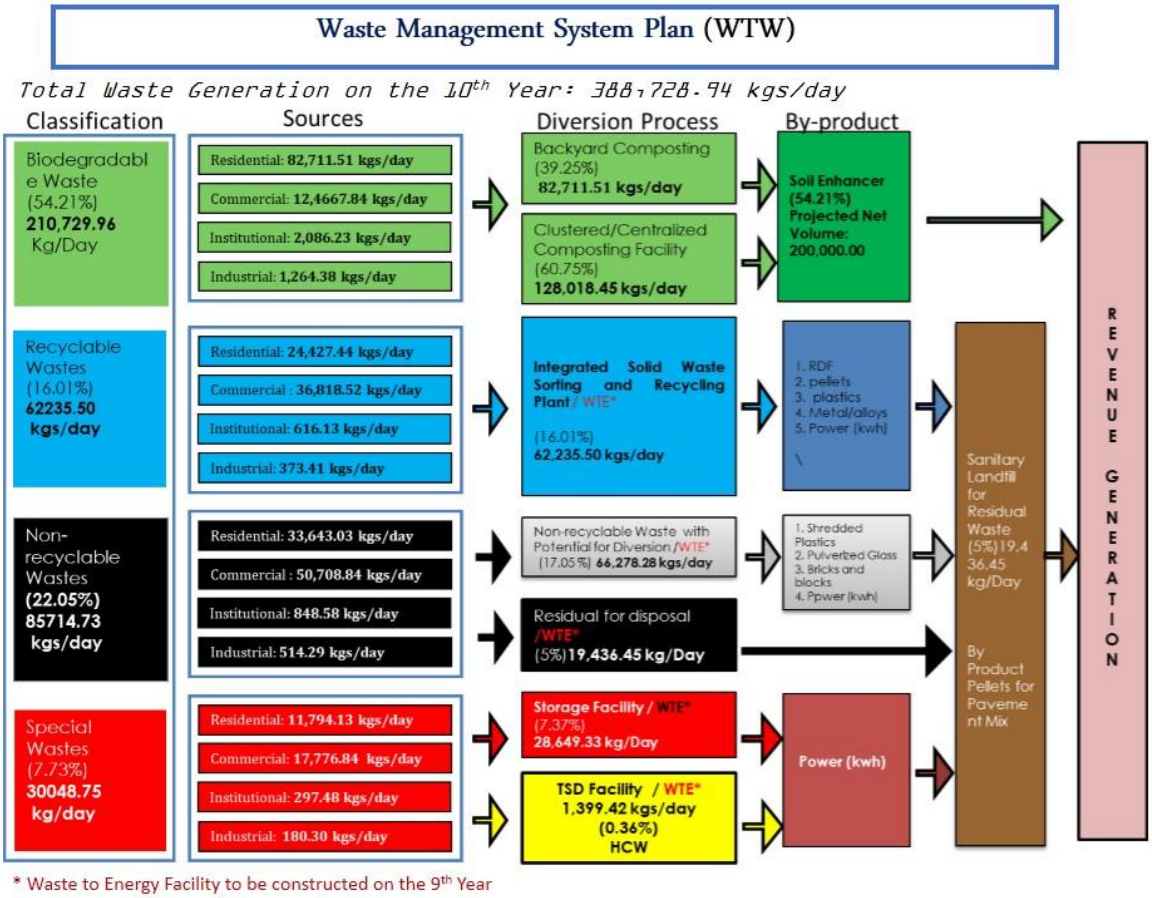

Figure 21. Flow of waste collection, transport and disposal.

Overview. The City ENRO-ESWMD shall establish collection points and develop an effective and efficient waste collection schedule and routes covering all constituent barangays and other SWM stakeholders. Every collection is required to have a trip ticket indicating the barangay and route the trip will cover. Selling, buying, and sorting or "pagbubulasi" by waste pickers are strictly prohibited during scheduled collection time. Collection of recyclables and biodegradables is prohibited. Only residual and special wastes will be collected by the ESWMD for transfer, sorting, recycling and processing at the ISW-SRP Plant.

Collection Equipment and Routes. All mini dump trucks of the CENRO-ESWMD will be strategically distributed to the constituent barangays to facilitate waste collection. Currently, generated wastes within the CBD are collected in a daily basis. The collection schedule in the 45 serviced barangays is dependent on the volume of wastes generated and population density. Table 50 shows the existing mode of waste collection.

A feasibility study will be conducted relative to the possible expansion of area coverage for collection from 45 to 86 barangays which is one among the targets of the plan.

Table 50. Collection schedule and equipment.

COLLECTION EQUIPMENT	FREQUENCY	MORNING COLLECTION SCHEDULE	AFTERNOON COLLECTION SCHEDULE
JM 4811 (HINO 6-WHEELER MINI-DUMPTRUCK)	DAILY	4 AM-12 NN	3 PM- 11 PM
JM 4813 (UNDER REPAIR)			
JM 4514 (HINO 6-WHEELER MINI-DUMPTRUCK	DAILY	4 AM – 12 NN	3 PM-11 PM
JM 4816 (HINO 6-WHEELER MINI-DUMPTRUCK	DAILY	4 AM – 12 NN	3 PM-11 PM
JM 4822 (HINO 6-WHEELER MINI-DUMPTRUCK	DAILY	4 AM – 12 NN	3 PM-11 PM
JM 5074 (HINO 6-WHEELER MINI-DUMPTRUCK	DAILY	4 AM – 12 NN	3 PM-11 PM
HINO 6-WHEELER MINI-DUMPTRUCK (to be purchse)	DAILY	4 AM – 12 NN	3 PM-11 PM
HINO 6-WHEELER MINI-DUMPTRUCK (to be purchse)	DAILY	4 AM – 12 NN	3 PM-11 PM
HINO 6-WHEELER MINI-DUMPTRUCK (to be purchse)	DAILY	4 AM – 12 NN	3 PM-11 PM
HINO 6-WHEELER MINI-DUMPTRUCK (to be purchse)	DAILY	4 AM – 12 NN	3 PM-11 PM
IZUSU (10 WHEELER DUMPTRUCK	DAILY	4 AM – 12 NN	3 PM-11 PM
IZUSU (UNDER REPAIR)			
NISSAN (UNDER REPAIR)			

Collection Routes. The City ENRO ESWMD updatedthe schedule of garbage collection in the city.

Table 51. Garbage collection (morning shift: 4:00 AM- 12:00 NN).

DAY	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 6	ROUTE 7	ROUTE 8	ROUTE 9
Mon	Prov. Hospital, Bayanihan, Ampayon, Villa Kananga	Baan Riverside, Ong Yiu, Obrero, Pagatpatan, Slaughter (MRF), Bayanihan, Sprinkles, Agusan Pequeño	Luciana, Inland, Robinson's, Golden Ribbon, Airport, Bayanihan	Baan Km.3, Bayanihan, Villa Kananga	Tabuan, Ressurection Langihan, Bus Terminal, Ressurecc ion Langihan Bayanihan	Doongan Babag	Pinamancula n Dumalagan	MJ Santos San Mateo Manila de Bugabos	Maguinda Maibu
Tue	Fort Poyohon, Gaisano (Jollibee), Ampayon-MRF, CSU, Villa Kananga, PNP-PRO 13, Imadejas	Ong Yiu, San Ignacio, Bading, Obrero, Ambago, Bayanihan	Luciana, Inland, Gaisano Robinson's, Golden Ribbon, Airport, Bayanihan, Villa Kananga	Baan Km. 3, Bayanihan, Villa Kananga	Tabuan, Ressurrec cion Langihan, Bus Terminal, Ressurecc ion langihan Bayanihan	Doongan Babag	Kinamlutan Bit-os	Dankias	Aupagan Don Francisco Bilay
Wed	Bayanihan, Prov.Hosp ital, Ampayon, Villa Kananga, Imadejas	Baan Riverside, Ong Yiu, BMC, Buhangin, Bancasi (P-6), Obrero (MRF), Salughter, Maon, Pangabug an, Bayanihan	Luciana, Inland, Robinson's, Golden Ribbon, Airport, San Ignacio Bayanihan	Baan Km. 3, Bayanihan, Villa Kananga	Tabuan, Ressurecc ion Langihan, Bus Terminal, Ressurecc ion Langihan Bayanihan	Doongan Babag	Amparo Bitan-agan Dulag	Florida	Camahayan Salvacion
Thu	Fort Poyohon, Gaisano (Jollibee), Ampayon, Villa Kananga, PNP-PRO13	Ong Yiu, San Ignacio, Pagatpata n, Agusan Pequeño, Obrero	Luciana Inland, Gaisano Robinson's, Golden Ribbon, Airport, San Ignacio Bayanihan	Baan Km.3, Bayanihan, Villa Kananga	Tabuan, ressurecci on Langihan, Bus Terminal, Ressurecc ion Langihan Bayanihan	Doongan Babag	Salvacion	Tungao	Aupagan Don Francisco Bilay
Fri	Prov. Hospital, Bayanihan, Imadejas, Ampayon, Villa Kananga	Tiniwisan, Ong Yiu, Baan Km.3, Bading, Sprikles, Obrero, Ambago	Luciana Inland, Gaisano Robinson's, Golden Ribbon, Airport, bayanihan, Villa Kananga, Bayanihan	Baan Km. 3, Bayanihan, Villa Kananga	Tabuan, Ressurecc ion Langihan, Bus Terminal, Ressurecc ion	Doongan Babag	Pinamancula n Dumalagan	MJ Santos San Mateo Manila de Bugabos	Salvacion
Sat	San Ignacio, Gaisano, Imadejas, Ampayon, Villa Kananga,	Mahogany, Bancasi, (P6), Obrero, Pangabug an, Maon	Luciana, Inland, Gaisano Robinson's, Golden Ribbon, Airport, Bayanihan,	Baan Km. 3, Bayanihan, Villa Kananga	Tabuan, Ressurecc ion Langihan, Bus Terminal, Ressurecc	Doongan Babag	Kinamlutan Bit-os	Dankias	Maguinda Maibu

	PNP-PRO 13		Villa Kananga		ion langihan				
Sun	Lumbocan, Masao, Gaisano, Bayanihan	None	Luciana, Inland, Gaisano Robinson's, Golden Ribbon, Airport, Bayanihan, Villa Kananga	Bading, Ambago	Tabuan, Ressurecc ion Langihan, Bus Terminal, Ressurecc ion Langihan	Doongan Babag	Amparo Bitan-agan Dulag	Nongnong Tungao	Florida Sumile

Table 52. Garbage collection (afternoon/evening SHIFT 3:00 - 11 PM).

DAY	ROUTE 11	ROUTE 12	ROUTE 13	ROUTE 14	ROUTE 15	ROUTE 16	ROUTE 17	ROUTE 18
Mon	PPA, Red Apple, BCES, Chowking, FSUU, ANHS, Sikatuna, Urduja, ZCC, Limaha	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao, Rajah Soliman, Santos Hospital, Datu Silongan, Tandang Sora (2 trips)	Diego Silang, BCPO 1, LTO, Capitol, Humabon, Leon Kilat, Limaha	City hall, BCSAT, Lapu-lapu, Grand Palace, DSWD-13, DepEd, Dagohoy, J.P. Rizal	Taga-baca Pigdaulan	Bugsukan	Baobaoan	Mandamo
Tue	PPA, Red Apple, BCES, Chowking, FSUU, ANHS, Sikatuna, Limaha, Libertad	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao, Rajah Soliman, Santos Hospital, Datu Silongan, Tandang Sora, Libertad	Diego Silang, BCPO 1, LTo, Capitol, Humabon, Leon Kilat, Tabuan, San Vicente	City Hall, BCSAT, Lapu-lapu, Grand palace, DSWD-13, DepEd, Dagohoy, J.P. Rizal	Lemon Basag	Taguibo Sumilihon	Maug Banza Bobon	Sumile
WED	PPA, Red Apple, BCES, Chowking, FSUU, ANHS, Sikatuna, Limaha, Libertad	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao, Rajah Soliman, Santos Hospital, Datu Silongan, tandang Sora, Libertad	Diego Silang, BCPO 1, LTO, Capitol, Humabon, Leon Kilat, Limaha	City Hall, BCSAT, Lapu-lapu, Grand Palace, DSWD-13, DepEd, Dagohoy, J.P. Rizal	Antongalon Taligaman De Oro	Los Angeles Santo Niño	Nongnong	Pianing
Thu	PPA, Red Apple, BCES, Chowking, FSUU, ANHS, Sikatuna,	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao,	Diego Silang, BCPO1, LTO, Capitol, Humabon, Leon	City Hall, BCSAT, Lapu-lapu, Grand Palace, DSWD-13, DepEd,	Taga-baca Pigdaulan	Cabcabon	Camahayan	Sumile

	Limaha, Libertad	Rajah Soliman, Santos Hospital, Datu Silongan, Tandang Sora (2 trips)	Kilat, Tabuan, San Vicente	Dagohoy, J.P. Rizal, San Vicente				
Fri	PPA, Red Apple, BCES, Chowking, FSUU, ANHS, Sikatuna, Urduja, ZCC, Limaha	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao, Rajah Soliman, Santo Hospital, Datu Silongan, Tandang Sora (2 Trips)	Diego Silang, BCPO 1, LTO, Capitol, Leon Kilat, Tabuan, San Vicente	City Hall, BCSAT, Lapu-lapu, Grand Palace, DSWD-13, DepEd, Dagohoy,J.p. Rizal	Lemon Basag	Bugsukan	Nongnong	Mandamo
Sat	PPA, Red Apple, BCES, Chowking, FSUU,ANHS, Sikatuna, Limaha, Libertad	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao, Rajah Soliman, Santos Hospital, Datu Silongan, Tandang Sora, Libertad	Diego Silang, BCPO 1, LTO, Capitol, Humabon, Leon Kilat, Tabuan, San Vicente	City Hall, BCSAT, Lapu-lapu, Grand Palace, DSWD-13, DepEd, Dagohoy,J.P. Rizal, San Vicente	Camahayan	Los Angeles Santo Niño	Maug Banza Bobon	Cabcabon
Sun	BCES, Chowking, FSUU, ANHS, Sikatuna, Urduja, ZCC, Limaha	Rose Bakeshop, Villanueva, FSUU Gym, Burgos, Agao, Rajah Soliman, Santos Hospital, Datu Silongan, Tandang Sora (2 trips)	Diego Silang, BCPO 1, LTO, Capitol, Humabon, Leon Kilat, Limaha	City Hall, BCSAT, Lapu-lapu, Grand Palace, DSWD-13, DepEd, Dagohoy,J.P. Rizal	Antongalon Taligaman De Oro	Taguibo Sumilihon	Baobaoan	Pianing

Private Collection Service. The City Government do not have any existing contracts and/or engagements to any private companies and/or corporations for the collection of the City's solid wastes. The City ENRO-ESWMD is the office responsible for the collection, transport and disposal of generated wastes within the city.

Storage and Set-out. The City Government do not provide, install or set-up waste receptacles due to the existence of Barangay MRFs required by RA 9003.

For Residential Areas

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

For Commercial Areas

(1) 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
(2) The person concerned shall remind the barangay concerned to collect those uncollected solid wastes and other related matters.

For Industrial Areas

(1) The head of any institutional or industrial establishment shall assist the City Government in the orderly and sanitary way of collecting and transporting their generated solid wastes;
(2) The collection and transportation of any special and hazardous wastes, if necessary, shall be duly coordinated with the government agencies concerned.

Segregated Recyclables

(1) The City Government is strictly implementing Section 10 of RA 9003, Section 5 of SP Ordinance No. 2380-2002 and EO 191 series of 2016. As such, it is mandated that all recyclable and reusable wastes should be segregated properly and be placed in an enclosed bag prior to collection (in the barangay level) and further storage in the barangay MRFs.

(2) All segregated recyclable and reusable wastes shall be delivered and sold to the Ecological Solid Waste Processing Compliant Facility/ Integrated Solid Waste-Sorting, Recycling, Processing (ISW-SRP) Plant to facilitate waste conversion, diversion, processing and income generation.

Segregated Compostable

(1) All biodegradable waste materials shall be collected and segregated in the barangay level.
(2) All biodegradable waste materials shall either be composted in the barangay level and/or transported to the clustered composting area.
(3) All biodegradable wastes shall be delivered and sold to the ISW-SRP Plant to facilitate waste conversion, composting, processing and income generation.

Mixed Solid Wastes and Residuals

(1) "No segregation, No collection" shall be strictly implemented.
(4) Collected mixed wastes including residual wastes shall be transported to the clustered MRF and then to ISW-SRP Plant to facilitate waste conversion, composting, processing and income generation.
(2) Special wastes shall be stored in the rehabilitated septic vault.
(3) Hazardous and toxic wastes shall be properly labelled and sealed, preferably in non-corrosive and/or plastic containers. It will then be transported to the ISW-SRP Plant to facilitate disinfection and treatment.

7.3 Segregation, Recycling and Composting

The City Government is strictly implementing the "No Segregation, No Collection" policy. As such, the segregation and further processing of recyclable and reusable wastes materials are highly-encouraged in the barangay level. In addition, compostable wastes are also required to be properly segregated and transported to the clustered composting facilities. All biodegradable wastes shall then be subjected to vermi-composting and/or other practical and appropriate composting technologies available.

Segregation

(1) SP Ordinance No. 2380-2002 and EO 191 series of 2017 shall be implemented strictly in the barangay level to facilitate the effectivity of solid waste segregation in the households, offices, industries, commercial establishments and the academe.
(2) The "No Segregation, No Collection" policy will be enforced and expanded to include special and hazardous wastes.
(3) There shall be different waste collection schedule for each type of wastes identified, especially those that are classified as residuals and special/hazardous wastes.

Recycling

(1) All recyclables and reusable waste materials collected in the households, commercial establishments, industries and institutions shall be brought mainly to the Barangay MRFs or clustered MRF for further sorting, selling and transport to the ISW-SRP Plant to facilitate waste conversion, composting, processing and income generation.
(2) An amendment to the existing Building Ordinance of Butuan City shall be made. The amendment shall be focus on requiring constructed and newly-constructed buildings, establishments and offices to facilities for SWM.

Composting/Management of Biodegradable waste

(1) All households are encouraged to segregate biodegradable wastes and practice backyard composting.
(2) The collection of disposed and segregated biodegradable wastes shall be the responsible of the barangay.
(3) Biodegradable wastes generated in the barangays shall be transported to the respective central composting area of the clustered barangays.
(4) All biodegradable wastes shall be delivered and sold to the ISW-SRP Plant to facilitate waste conversion, composting, processing and income generation.

Marketing and Market development

(1) Plastics, fertilizers, RDF pellets, metals and alloys, bio-char produced in the ISW-SRP Plant will be marketed and exported to potential investors within the country and in the global market.
(2) Waste scavengers and existing buy-back centers will be organized to form cooperatives that are focused in solid waste management, particularly waste recycling and composting.

7.4 Transfer

The City Government of Butuan is looking into the possibility of constructing a Centralized MRF and Clustered MRF and Composting Areas as the drop off points of mixed and biodegradable wastes coming from the different barangays.

7.5 Alternative Technologies for Residual Wastes

Aside from procuring glass pulverizers, plastic densifiers, shredders and molders, the City Government will construct an Ecological Solid Waste Processing Compliant Facility containing an Integrated Solid Waste-Sorting, Recycling, Processing (ISW-SRP) Plant. The said plant will utilize disinfection mechanism that is globally health compliant. In addition, waste to energy (WTE) will be explored to maximize waste conversion most of the biodegradable and residual wastes and so that industrial and agricultural wastes maybe covered also. Recyclable wastes will be converted into RDF pellets, plastics, metals and alloys, etc.

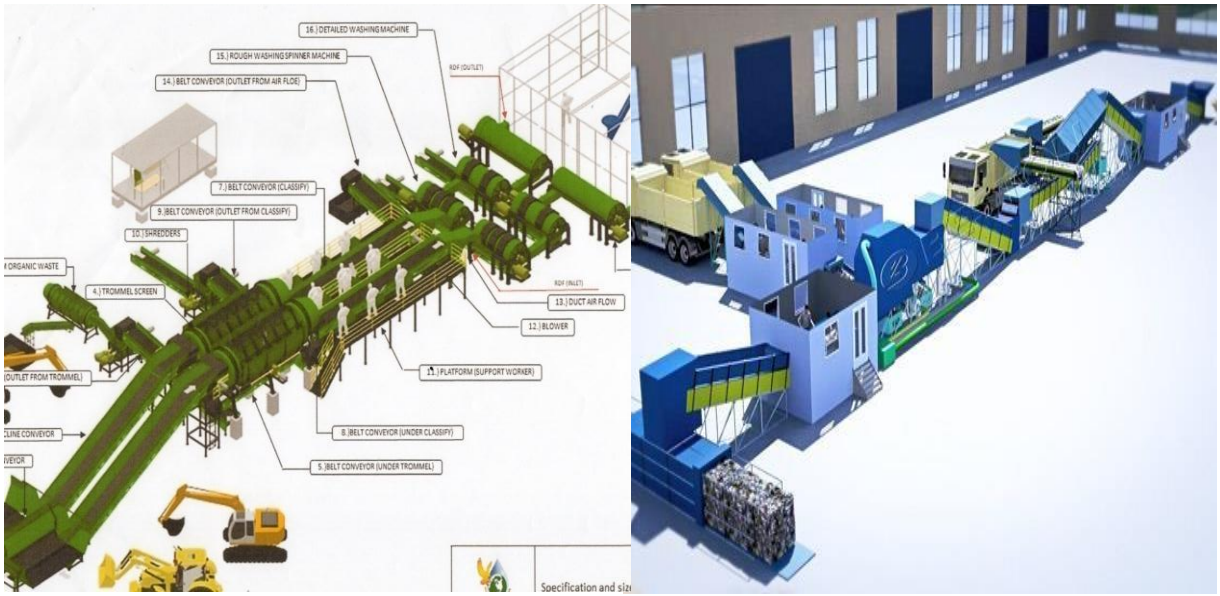

Figure 22. Ecological Solid Waste Processing Compliant Facility

7.6 Disposal

The City Government of Butuan will expand the coverage of waste collection services throughout the 86 barangays. Provision of additional SWM equipment that support efficient SWM System will be necessary. The existing SLF will eventually be transformed and established into an eco-park through the construction and operation of the Ecological Solid Waste Processing Compliant Facility.

Considering expansion coverage of waste collection, the existing SLF is essentially filled up and a new location must be identified and developed as soon as possible to accommodate the future waste generation of the City. City Government of Butuan is looking forward the realization of its initiative which a Pre-feasibility was already undertaken through partnership and technical support with the National Economic Development Authority (NEDA) through its Master Plan for Sustainable Urban Infrastructure Development (MPSUID) Program where the proposed project/site is located in a 12 hectare that accommodates huge facilities such as SLF and the Ecological Solid Waste Processing Compliant Facility in the identified barangay within the city.

Moreover, a Safe and Closure and Rehabilitation Plan (SCRP) for both the Doongan and Dulag controlled and open dumpsites will be developed and implemented. These sites will be transformed into ecological parks. Table 53 shows City ENRO Waste Disposal Plan.

Table 53. 10-Year Disposal Plan

SWM Facilities	10-year Intervention	Output
Brgy. Dumalagan Sanitary Landfill	Upgrading of Sanitary Landfill into Industrial Park	Old SLF converted into Industrial Park
Brgy. Doongan Open Dumpsite	Implementation of Safe Closure and Rehabilitation Plan	Open Dumpsite closed and rehabilitated into Eco Park.

Brgy. Dulag Open Dumpsite	Implementation of Safe Closure and Rehabilitation Plan	Open Dumpsite closed and rehabilitated into Eco Park.
Ecological Solid Waste Processing Compliant Facility	Construction and operation phase of ISW-SRP Plant	Established ISW-SRP Plant
Construction of new Sanitary Landfill Facility (SLF)	Construction of new Sanitary Landfill Facility (SLF)	New SLF constructed and operational
Centralized MRF	Construction of MRF	Established functional MRF
3 Clusters MRFs andComposting Facilities	Construction of 3 Cluster MRFs and Composting Facilities	Established 3 clusters MRFs and Composting Facility

Table 54. Formation of Clustered Barangays

Name of Cluster	Host Barangay	Members
NORTH CENTRAL	Doongan (Lower)	Agusan Pequeño, Ambago, Babag, Bading, Bancasi, Bayanihan, Doongan, Dumalagan, Fort Poyohon, Holy Redeemer, Humabon, Imadejas, Leon Kilat, Libertad, Limaha, Lumbocan, Masao, Obrero, Ong Yiu, Pagatpatan, Pinamanculan, San Ignacio, Sikatuna, Tandang Sora, Urduja
EAST	Baan Km.3	Ampayon, Anticala, Antongalon, Aupagan, Baan km 3, Baan Riverside, Banza, Baobaoan, Basag, Bilay, Bobon, Bugsukan, Buhangin, Cabcabon, Camayahan, De Oro, Don Francisco, Florida, Lemon, Los Angeles, Maguinda, Mahay, Mahogany, Maibu, Mandamo, Maug, Pianing, Pigdaulan, Salvacion, Santo Nino, Sumile, Sumilihon, Tagabaca, Taguibo, Taligaman, Tiniwisan
SOUTH CENTRAL	Bit-os	Agao, Amparo, Bit-os, Bitan-agan, Bonbon, Dagohoy, Dankias, Diego Silang, Dulag, Golden Ribbon, JPRizal, Kinamlutan, Lapu-lapu, MJSantos, Manila de Bugabus, Maon, New Society Village, Nong-nong, Pangabugan, Rajah Soliman, San Mateo, San Vicente, Silongan, Tungao, Villa Kananga

Waste Disposal Capacity. The city is currently utilizing the 6-hectare Dumalagan SLF as disposal facility which cater all residual waste from the 45 service barangays. Taking into consideration the increasing volume of waste, a new Sanitary Landfill Facility shall be constructed within the period of five years to cater residual waste which are yet to be converted into other uses.

Projected Waste in Butuan City for the next 10 years. Projection of the wastes generated for the next 10 years was estimated based on the assumption that

there will be no intervention from the LGU and other organizations. Likewise, the projection was simulated based on the available population data from PSA. As shown in Table 39 and Table 47 there is a continuous increase in the volume of wastes that will be generated. Among all waste categories, it is being projected that there will be more of the biodegradable wastes to be generated followed by the recyclable, non-recyclable and the special wastes. Also considered is the expansion of collection service areas from 45 barangays to 86 barangays if possible. The projected total waste generation for the next 10 years using the waste generation per capita will be 388,728.94 kilograms per day based on the projected population including immigrants.

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Considering the increasing volume of waste, it is necessary to introduce efficient technologies that help the city's aim of 95-100% waste diversion.

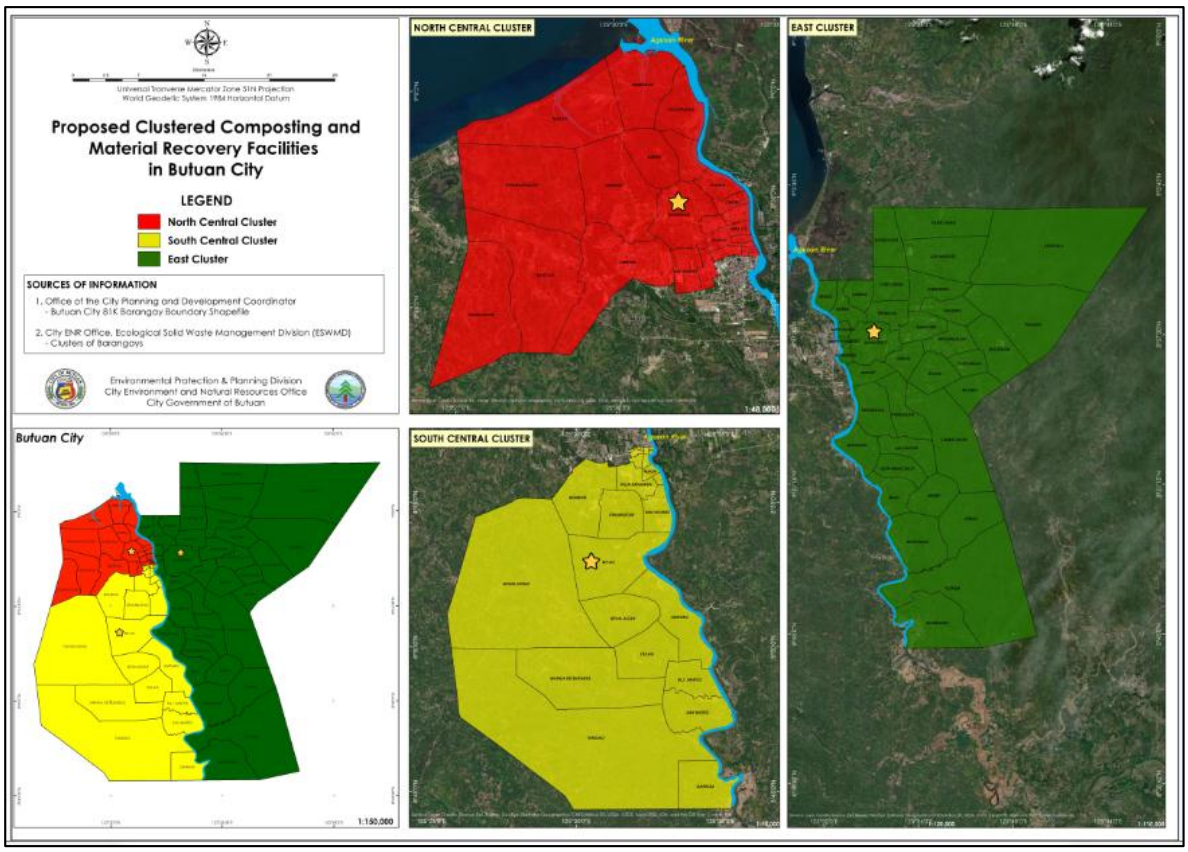


Figure 23. Map showing the proposed 3-clusters for MRF and composting facilities.

Existing Facilities. The Doongan Open Dumpsite which began operating in 1984 was officially closed on April 2012 with an Approved Authority to Close (ATC) issued by DENR – Environmental Management Bureau (EMB) for the safe closure and rehabilitation plan (SCRP) is a requirement of the DENR per DAO No.9, Series of 2006 with the subject General Guidelines in the Closure and Rehabilitation of Open and Controlled Waste Disposal Facilities. On-going process and implementation of the safe closure and rehabilitation plan are already being undertaken by the City Government.

Figure 24. Open Dumpsite in Barangay Doongan

Meanwhile, the Dulag Open Dumpsite which operated in February 2014 was officially closed on June 2016. Currently, the dumpsite's Safe Closure and Rehabilitation Plan was already being processed in close coordination with DENR-EMB Caraga Region and other concerned offices of the City Government. The City Government shall implement initial activities for its safe closure meantime that fund allocation for the SCRP is yet to be approved. Initial activities to be undertaken include the installation of signages, planting of kakawate and other species along perimeter lines and putting up of indigenous gas vent such as bamboos, etc.

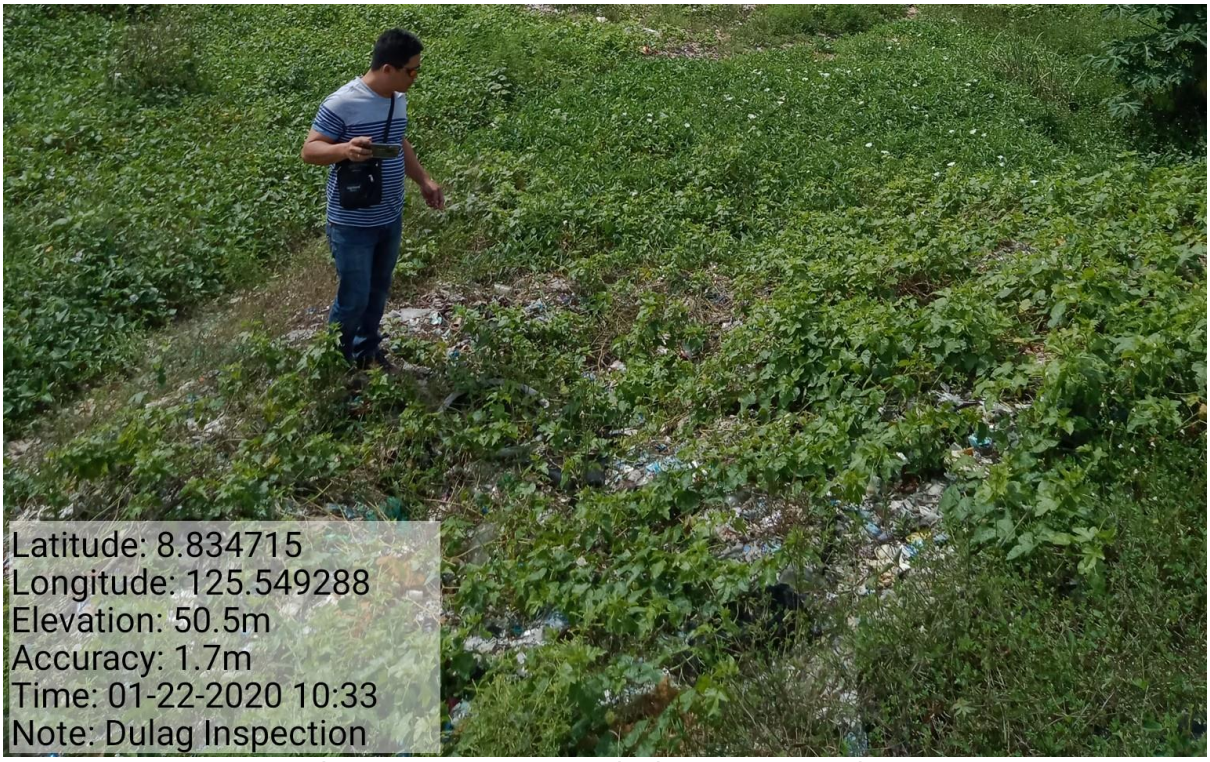


Figure 25. Open Dumpsite in Barangay Dulag.

New Facilities. Meantime that the feasibility study for waste to energy is on process, the City Government of Butuan will establish an Ecological Solid Waste Processing Compliant Facility which contains an Integrated Solid Waste-Sorting, Recycling, Processing Plant. The facility serves as an integrated solid waste management system where vital facilities are installed for large scale recycling using sorting machine, bottle crusher, plastic shredder, glass puverizer and composting of biodegradable materials. The said facility will be constructed and situated in a strategic area within the city.

In addition, the City Government of Butuan will be purchasing 43 units of dump trucks to facilitate the collection, transport and disposal of solid wastes within the central business district and urbanizing barangays of the city.

Meanwhile, barangays will be clustered and a specific area shall be identified as central MRF and Composting Area for each cluster comprising several barangays. The clustered area shall be the receiving areas for all Recyclable, Residual and Biodegradable wastes for all the clustered barangays. Among the equipment that will be purchased for the facility are as follows: compactors, dump trucks, etc.

Centralized MRF Design. The facility will serve as final sorting area of all collected waste coming from service barangays to ensure that the waste to be disposed at the SLF are only unusable residual wastes.

As of this moment, establishment of a Central MRF is proposed as part of the upgrading and expansion of the City's SLF which is still on process.

Sanitary Landfill Facility (SLF). The City Government of Butuan granted and approved the Sanitary Landfill Facility having 6 hectares through Special Land Use Permit No. SUP-R13-001-SLF by the Department of Environment and Natural Resources Regional Office XIII. This is in accordance to Section 57 of PD No. 705 Forestry Code of the Philippines, FAO No.8 as amended and DAO No. 98-24. The facility is located in Brgy. Dumalagan, Butuan City. Figure 26 below are the structure of the SLF.

Figure 26.SLF design in Brgy. Dumalagan, Butuan City (above left:SLF Cell, above right: Aerator Pond, below: Settling Pond)

Due to the limitation and the life capacity of SLF, the City Government of Butuan provides strict implementation of waste segregation policy and the operational of Barangay MRF. All segregation and collection policy are in accordance to the ordinances, executive order and memorandum anchored in RA 9003 or Solid Waste Management Act of 2000. Dumpsite in Doongan and Dulag operated by the previous management are already closed and subject for proper management and rehabilitation.

7.7 Special Wastes

In the span of 10-years, the amount of special wastes generated in Butuan City is projected at 30,048.75 kilograms (WACS, 2019). Special wastes such as e-wastes, paint containers, expired medicines, spray canisters and cosmetics will be deposited, stored in the rehabilitated septic vault inside the upgraded Dumalagan SLF. It will then be processed inside the ISW-Processing Plant.

Household Special Wastes.

Collection.

a. Identifying the classification or type of special wastes generated from the household
b. Labeling of special wastes depending on its classification or type
c. In place to the separate vessel or container, tank, drum, and plastic (polyethylene) bag to prevent mixing of wastes
d. Ensure no damage or leakage of its vessel or container, tank, drum, and plastic (polyethylene) bag
e. Ensure equipped strong lid or cap to prevent spillage during transport
f. Mobilizing garbage truck to Sanitary Landfill as soon as possible.

Disposal

a. In place at the Sorting Area for sorting depending on its classification or type
b. Ensure special waste with similar characteristic or mutually compatible when mixed
c. Ensure Storage Facility for special waste only
d. Ensure self-reacting special waste are not left in the container, drum, and plastic (polyethylene) bag
e. Seal septic vault to avoid accident of our SLF workers
f. Seal the special waste tightly in the container, drum, and plastic (polyethylene) bag

Health care wastes. As of this date, hazardous and infectious wastes from hospitals and health care facilities are not collected by the City ENRO ESWM Division as per DENR-DOH Joint Administrative Order No. 005-02. These stakeholders are required to acquire the services of a third party treatment, storage and disposal facility (TSD) to manage this type of waste.

Meanwhile, with the construction of the ISW-SRP Plant the generated hazardous and infectious wastes will be treated and disinfected through ozonation and will be converted in the WTE component of the processing plant.

7.8 Information, Education and Communication (IEC)

Advocacy campaigns pertaining to solid waste management is anchored from the national “War on Waste” program initiated since 1997. The program has already

completed a 20-year implementation cycle at various public schools and communities in Butuan City. Initial efforts included three major components namely, education, engineering and enforcement.The provisions of visual aids, posters at strategic locations; public LEDs, Schools and overpasses will be simultaneously done.

Introduction. The education component of the City Government's IEC initiatives involves the conduct of trainings in ESWM for trainers, administrators, teachers and parents. Meanwhile, the engineering of component of the campaign involves the orientation on waste segregation, marketing of recyclables, design and construction of composting areas and putting up of edible gardens. Moreover, the enforcement component includes programs pertaining to incentives and awards, providing sanctions to violators, empowering and deputizing Barangay Bantay Kahinlo Brigade Volunteers (BBKBV). The crafting of appropriate ordinances pertaining to ESWM and environmental conservation are also included.

The target participants in the conduct of IEC were the barangays councils, 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". Reducing the individual's ecological footprint in order to resolve the increasing rate of waste generation.

Core Messages. Generally, the IEC materials that will be developed shall follow the fundamentals of the waste management hierarchy. These are as follows: source reduction and minimization of wastes generated at source; resource recovery, recycling and reuse of wastes at the barangay; efficient collection, proper transfer and transport of wastes by the City and; efficient management of residuals wastes.

Linkage to other partners such as but not limited to media groups, socio-civic organizations, POs, NGOs shall be established. To ensure the support of these groups in the IEC campaign, it shall be formalized through a Memorandum of Agreement (MOA) defining the roles of each agency/organizations involved. Regular feed backing and assessment will be conducted with the partners.

Table 55.Summary of core messages implemented per sector.

SECTOR	COORDINATION WITH OTHER AGENCIES	CORE MESSAGES
City Government Workers and Officials	General Services Office/ City Planning/PIO/CMO/City ENRO	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. 3 R (Reduce, Re-use and Recycle

Barangay LGU's and Workers	LGU, BLGU, DENR – EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191.
Commercial and other business establishments.	LGU, BLGU, DENR – EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility 3 R (Reduce, Re-use and Recycle
Government and public health care facilities.	LGU, BLGU, DENR – EMB, DOH	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility To comply with RA 6969 for special/hazardous wastes
Public and private schools, colleges and universities.	LGU, BLGU, DENR EMB, CHED, DEPED	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility To comply with RA 6969 for special/hazardous wastes 3 R (Reduce, Re-use and Recycle
Residences/Households under the jurisdiction of Butuan City	LGU, BLGU and DENR EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To make their own biodegradable wastes/composting facility. To come-up with technology to use the recyclable wastes at source. 3 R (Reduce, Re-use and Recycle

All existing Religious Groups and Churches	LGU, BLGU, PO, DENR EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. To establish their own MRF Facility 3 R (Reduce, Re-use and Recycle.
Registered NGO, Peoples Organization and Association	LGU, BLGU, PO, DENR EMB	Segregation and Reduction at Source in compliance to RA 9003 and E.O 191. 3 R (Reduce, Re-use and Recycle.

Approach. Brochures and fliers which discuss ecological solid waste management and its principles were developed. The theories and principles pertaining composting, especially 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. Table 56 shows the planned SWM IEC activities of the City Government of Butuan.

Table 56. ESWMP IEC implementation action plan.

ACTIVITY	TARGET AUDIENCE	MESSAGE	METHOD	TIMEFRAME
Reorientation on RA 9003	9 Stakeholders; Subdivisions, Gov't Offices/ RLA's/Province, Schools, Establishments/Commercial/ Hotels, Utilities, Sari-sari/SME's/Household (Barangays), Church, Hospitals and Industries	Increase awareness relative to the role of the barangay and effective implementation of the ESWM program of the school and stakeholders	Seminar, lecture	Every Quarter
	City ENRO staffs	Increase awareness relative to the salient	Seminar, lecture	

		features of the law		
Evaluation of the Butuan City Search for the Most Environment Friendly Barangays	86 Barangays	Ensure the sustainability and efficacy of the SWM programs of the 86 barangays	Interview, Site Inspection and coaching by the evaluators	Annual
Evaluation of the Butuan 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, Site Inspection and coaching by the evaluators	Annual
Massive Barangay Clean-up relative to the Earth Day Celebration and Mangrove planting	86 Barangays	To find possible solutions to the problematic areas within their respective barangays	Actual clean-up drive	Every 22nd of April and quarter
Localized Environment Week Celebration	86 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	86 Barangays	Plastic waste minimization	Recorida, Store to Store Campaign, Video Presentation, Lecture/seminar	Quarter

Barangay Training on ESWM. The Barangays were given training/seminar workshop with participants composed of the Barangay Chairman, and the Barangay

Kagawad on Environment pertaining to the evaluation of RA 9003 and EO 191 compliance. The training workshop enabled them to formulate their vision/mission statements and action plans, which will then be incorporated in the barangay ESWM plan.

The City ENRO have also conducted and facilitated various cross visits to nearby cities and municipalities to observed exemplary waste management practices and enabled the participants to gain insights for them to apply in their respective barangays. Table 57 shows the GGZW behavioural change communication for proper SWM.

Table 57. GGZW behavioural change communication for proper SWM.

FRAMEWORK	STRATEGIES
EDUCATION • Promote awareness of the linkages between and among wastes, health and environment & development issues to the community. • Inculcate on one's mind that some wastes can be converted into an environment friendly and income generating opportunity for the community. • CENRO in coordination will continue to coordinate with the DepEd to facilitate inclusion of solid waste management into the school curricula. Inculcating the importance of solid waste management into the young minds of the students will somehow bring the practice even in their own homes. • Community Affairs and Information Division of CENRO will intensify its IEC efforts and will be complemented by putting in place an effective and efficient method of collection, transport storage and disposal.	• Household with best SWM practice (Brgy. level contest) • Barangay with best SWM practice (City-wide contest) • Barangay with the highest percentage household compliance on waste segregation contest (City-wide) • Well organized barangay in the implementation of SWM contest (City-wide) • 5 Cleanest and 5 Dirtiest Barangays Contest (City-wide) • Poster Making Contest on SWM and environmental concern (City-wide) • For TV, Film clips demonstration on waste management. The City shall allocate annual funds for the payment of airtime in the showing of the demo system. The film clips will show the benefits in practicing ecological waste management system in terms of money, health and cleanliness of the surrounding and love of nature. • For movie advertisement on waste management. The movie ads on proper waste management will be shown in all movie houses in the City

	as intermission to regular movies. The City shall allocate annual funds for the production and showing of the movie advertisement on waste management. • For billboard advertisement. The billboards to be installed will be large enough to catch the attention of the general public and to be placed in strategic places.

CHAPTER – VIII

IMPLEMENTATION STRATEGY

8.1 Framework

The City Government of Butuan used the logical framework to implement and monitor its solid waste management system. Table 58 shows the ESWM Program log frame.

Table 58. ESWM Program framework for waste diversion.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATOR	MODE OF VERIFICATION (MOV)	INITIAL ASSUMPTION
Objectives 1. Waste Diversion	a. Conduct of Feasibility Study for the establishement of an Ecological Solid waste Processing Compliant Facility and Waste to Energy Processing Plant b. Establishement of an Ecological Solid waste Processing Complaint Facility c. Establishment of Integrated Solid Waste-Sorting, Recycling, Processing Plant d. Construction of new SLF e. Construction of 3-clustered MRFs and Composting Facilities f. Evaluation and provision of incentives and awards to the Best Practices Barangays covers households SWM best practices, barangays with highest percentage in compliance with RA 9003.	a. Project accomplishment report b. Project accomplishment report c. Accomplishment report d. Project accomplishment report e. Project accomplishment report f. Records from City ENRO-EPPD and SWMD	100% Waste diversion

Collection.

Table 59. Programs and interventions for waste reduction.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATOR	MODE OF VERIFICATION (MOV)	INITIAL ASSUMPTION
Objectives 2. Increase collection effeciency/coverage and proper collection and disposal of residual and special waste	1. Procurement of additional garbage collection vehicles/equipment to facilitate effecient collection. 2. Increase frequency schedule of Garbage collection 3. Formulation of cost-effective route schedule for collection 4. Evaluate and monitor compliance of collection route schedule 5. Establishment of Collection Points of every barangays 6. Institutionalized barangay schedule collection 7. Preparation of Feasibilty Study on expansion of 86 serviced barangays. 8. Ensure active Barangay ESWM Board 9. Strict enforcement of “No Collection, No Segregation Policy”, Segregation at source and other SWM governing laws.	Records from City ENRO-SWM Division	Institutionalize efficient waste collection and disposal throughout serviced barangays

Information, Education & Communication.

Table 60.Programs and interventions for IEC

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATOR	MODE OF VERIFICATION (MOV)	INITIAL ASSUMPTION
Objectives 3. Stengthen IEC	1. Conduct of Seminars in 8 Stakeholder such as subdivisions, Gov't Offices/RLA's/Province, Schools, Commercial Establishments/Hotels, Utilities, Households(Barangays), Church, Hospitals and Industries) to properly disseminate the information on solid waste management, particularly the segregation, re-use, recycling and composting and other pertinent ESWM governing laws. 2. Promote local campaigns aiming specific parts of society re: Awareness on R.A. 9003 provisions. 3. Conscious development for children and young generation to attain sustainable solid waste management. 4. Conduct Training/Workshop on proper waste handling at the community or purok level as a way of igniting community participation in the LGUs solid waste management program. 5. Invest on movie, TVand radio advertisement. 6. Installation of signages in public areas and institutions. 7. Intensify Conduct of Envi. Awareness seminar on Buisness owner prior issuance of Environemental Clearance as pre requisite for Business Permit.	Records from City ENRO-SWM Division	Increased constituents/stakeholders awareness

Enforcement.

Table 61. Programs and interventions for enforcement.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATOR	MODE OF VERIFICATION (MOV)	INITIAL ASSUMPTION
Objectives 4. Intensify Enforcement	1. Amendment of existing SWM Ordinance and governing laws. 2. Capacitates local enforcers through trainings and seminars and provisions of protective gears and materials to be used for the enforcement. 3. Additional hiring of local enforcers to intensify enforcement of SWM governing laws 4. Revision of Environmental Code the creation of Enforcement and Regulatory Division 5. Issue Citation Tickets 6. Imposition of fines and penalties 7. Filing of case in court	Approved Revised Envi. Code, Approved Revised SWM Ordinance and Accomplishment Report	Intensified Pollution Control, Management, Regulation and Enforcement Program/System

Segregation, Recycling, Composting, Disposal and alternative Technologies. The City Government is strictly implementing the "No Segregation, No Collection" policy. As such, the segregation and further processing of recyclable and reusable wastes materials are highly-encouraged in the barangay level. In addition, compostable wastes are also required to be properly segregated and transported to the central composting areas per clusters. All biodegradable wastes shall then be subjected to vermi-composting and/or other practical and appropriate composting technologies available.

For Segregation, SP Ordinance No. 2380-2002 and EO 191 series of 2017 shall be implemented strictly in the barangay level to facilitate the effectivity of solid waste segregation in the households, offices, industries, commercial establishments and the academe.

The "No Segregation, No Collection" policy will be enforced and expanded to include special and hazardous wastes.

There shall be different waste collection schedule for each type of wastes identified, especially those that are classified as residuals and special/hazardous wastes.

For Recycling. The segregated recyclable and reusable waste materials at the household level shall be brought mainly to the Barangay MRFs for further sorting and selling to respective buy-back centers and/or junkshops.

The recyclable and reusable waste materials collected by the City ENRO shall be transported to the centralized MRF for further processing.

Buy-back centers shall also be organized and established may it be in a form of cooperatives and/or corporation.

An amendment to the existing Building Ordinance of Butuan City shall be made. The amendment shall be focus on requiring constructed and newly-constructed buildings, establishments and offices to provide storage space and/or systems that will facilitate the effective segregation and sorting of reusable and recyclable wastes

For Composting. All households are encouraged to segregate biodegradable wastes and practice backyard composting.

The collection of disposed and segregated biodegradable wastes shall be the responsible of the barangay.

All segregated biodegradable wastes shall be transferred to the respective central composting area of the clustered barangays for processing.

All collected biodegradable wastes shall be composted either by windrow, vermi-composting or other practical and appropriate composting technologies available.

The compost product shall either be sold (for further income) or introduced to the prime agricultural lands within the City as soil enhancers and fertilizers.

For Disposal. Only the City ENRO-ESWMD mini dump trucks will be allowed to directly dispose collected wastes in the SLF. This will ensure that mixed wastes coming from the barangays will not be deposited in the facility.

For Alternative Technologies. Alternative technologies shall further be explored by the City Government in dealing with residual wastes. Technologies such as but not limited to glass pulverizers, plastic shredders, densifiers and molders that could be used for the production of various marketable products. Aside from bioreactors which converts biodegradable wastes to biofuel, the City Government shall also explore the installation and establishment of a "waste converter" that could transform residual wastes into source of energy.

8.2 Diversion Projected

Using the 2010 ESWM Plan as a baseline, it is projected that the waste diversion in 2020 is 76.08% and will reach 95%-100% by the year 2029. By the year 2022 will implement and construct sorting, recycling and processing plant can be help to divert 95% solid waste. Table 62 shows the city's 10-year waste diversion with intervention.

Table 62. 10-Year waste diversion targets of Butuan City.

Year	Projected population	Daily waste generation based on population (kg/day)	Target waste diversion (%)	Weight diverted & to be diverted (kg/day)	Target waste disposal (%)	Target weight to disposal (kg/day)	WACS (kg/day)								
							Biodegradables		Recyclables		Residuals				Special
											RWPD		For Disposal		
							54.21%		**16.01%**		**22.05%**				**7.73 %**
2020	472,500	325,552.50	76.08	247,680.34	23.92	77,872.16	176,482.01	54.21 %	52,120.96	16.01 %	19,077.38	5.86%	52,706.95	16.19 %	25,165.21
2021	482,253	332,272.32	77.08	256,115.50	22.92	76,156.82	180,124.82	54.21 %	53,196.80	16.01 %	22,793.88	6.86%	50,472.16	15.19 %	25,684.65
2022	492,205	339,129.25	78.08	264,792.11	21.92	74,337.13	183,841.96	54.21 %	54,294.59	16.01 %	26,655.56	7.86%	48,122.44	14.19 %	26,214.69
2023	502,360	346,126.04	80.08	277,177.73	19.92	68,948.31	187,634.93	54.21 %	55,414.78	16.01 %	34,128.03	9.86%	42,192.76	12.19 %	26,755.54
2024	512,724	353,266.84	82.08	289,961.42	17.92	63,305.42	191,505.95	54.21 %	56,558.02	16.01 %	41,897.45	11.86 %	35,997.89	10.19 %	27,307.53
2025	522,631	360,092.76	84.08	302,765.99	15.92	57,326.77	195,206.28	54.21 %	57,650.85	16.01 %	49,908.86	12.86 %	33,092.52	9.19 %	27835.17
2026	532,728	367,049.59	86.08	315,956.29	13.92	51,093.30	198,977.58	54.21 %	58,764.64	16.01 %	61,884.56	13.86 %	30,061.36	8.19 %	28372.93
2027	543,018	374,139.40	88.08	329,541.99	11.92	44,597.42	202,820.97	54.21 %	59,899.72	16.01 %	66,821.30	14.86 %	26,900.62	7.19 %	28920.98
2028	553,505	381,364.95	90.08	343,533.54	9.92	37,831.40	206,737.94	54.21 %	61,056.53	16.01 %	75,739.08	15.86 %	23,606.49	6.19 %	29479.51
2029	564,193	388,728.98	95.00	369,292.53	5.00	19,436.45	210,729.98	54.21 %	62,235.51	16.01 %	85,714.74	17.05 %	19,436.45	5.00 %	30048.75

8.3 Monitoring and Evaluation Program

The City ENRO shall develop and adopt a community-based monitoring and evaluation tool in order to monitor the constituent barangay's compliance on the provisions of RA 9003 and EO 191. Quarterly monitoring and evaluation of all barangays in terms of RA 9003 compliance will be conducted.

8.4 Incentive Program

The City through Executive Order 191 provides incentives and awards for all the constituent barangays and sectors that are compliant or have developed effective and efficient strategies for the proper implementation of RA 9003 and EO 191.series of 2016 Incentives and awards are as follows:

Best Material Recovery Facility

Best Composting

Cleanest and Greenest Barangay (BLGU)

Most Compliant BLGU

Best Waste Reduction from Source Initiative (Households)

Best performing BBKBV (Barangay Bantay Kahinlo Brigade Volunteer)

Best BBKBV Volunteer

This program has already been implemented and organized since 2017 through collaboration with City Planning and Development Coordinator, City Legal Office and City PNP as specified in Section 8 of E.O 191 the adjudged winners for the incentive and reward system shall receive funds from the City Government intended for the development of specific ESWM projects and programs identified by the barangay or cash incentives for individual/household winners.

The success of the program will depend on the strong collaborative multi-sectoral partnership of non-government organizations (NGOs), the academe, local and national government agencies (NGAs), international partners and the civil society. In line with the conduct of such search, the City Government will be allocating funds annually to encourage more participation from its respective constituents.

CHAPTER – IX
INSTITUTIONAL ASPECTS

9.1 Roles

The Butuan City Ecological Solid Waste Management Board (BCESWMB) 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 Ten (10) year Integrated Solid Waste Management Plan through the City Environment and Natural Resources Office (City ENRO) which handles the management and operation of solid waste management related program. The City Government of Butuan initiates the 10-year SWM plan and provides logistic support and consistent in implementation on solid waste management governing laws that will lead achieving efficient solid waste management system. The Barangay will be effective and equipped in implementing solid waste management programs and policies. On the other hand, private entities and institutions will be collective participatory in terms of implementation. The City Government recognizes that the success of solid waste management does not just lie on the technical methods in the disposal of wastes. Thus, people's participation was applied wherein all sectors of the community were targeted to be involved in waste diversion in the barangay level. These include the private/industrial/agricultural sector, the schools, the 86 barangays, and all households.

Strategy for Cooperation. The Recycling Action Program implemented by the City ENRO together simultaneously with the GGZW identified a number of ways for developing public interest, providing information and sustaining participation in the SWM program. It focuses on recycling, composting and other aspects of SWM. Promotional methods in obtaining participation among residents in all the SWM activities and programs include information services such as periodical newsletters, publishing waste treatment manuals and making effective use of audio-visual presentations and other types of media. Surveys and periodical questionnaires are suggested for residents and companies to understand household and commercial waste quality and quantity. Waste recycling workshops are suggested for increasing public awareness, and campaigns for waste reduction, reuse and recycling.

Butuan City has made headway in public involvement through the Education Committee of the GGZW in close coordination with other working committees such as the Clean Communities, Streets, etc. Part of the launching of the GGZW, was a signing of commitments with all the committees identified under the program. Occasional organizational meetings have been held with these organizations. This effort needs to continue on both fronts, but at least as important is for the system of source separation, recycling and composting to bear some fruit. The integration of the proposed community-based system with buyers and waste recyclers is crucial (buy back system). Measuring the extent of recycling and publicizing information on the

amount of recycling and saving accruing to the City is also a crucial part to be integrated in the public information campaign.

Corporate social responsibility (CSRs) of commercial establishments and industries within the City will be tapped in the development and implementation of waste reduction, recycling and diversion programs. In addition, the private sector, academe and the religious sectors will also be involved in the implementation of IEC activities within the City.

9.2 Legal

The Sangguniang Panlungsod (SP) through the Committee on Environment and Natural Resources in close coordination with the City ENRO-EPPD will work on the amendments of existing SWM-related ordinances of the city. Amendments will focus on the strengthening of IEC, monitoring and evaluation programs and incentives to enforcers. In addition, raising of fines and penalties and a limit on availing the community service option will also be the focus of amendment. Moreover, the IRR of SP Ordinance No. 5334-2017 otherwise known as the “Plastic Regulation Ordinance of Butuan City” will also be presented and approved for implementation and enforcement.

Zoning and building code changes. Currently, the Comprehensive Land Use Plan (CLUP) of Butuan City is being updated. Hence, areas intended for SWM activities (e.g. areas for existing and proposed Junkshops, barangay MRFs, clustered/centralize composting areas, SLF, rehabilitated dumpsites, recycling and processing plants, etc.) must be identified and incorporated in the updated CLUP for proper location/relocation.

The implementation of the Green Building Code must be realized or amendment of Building Code. Higher level industries, commercial establishments, institutions, residential buildings, subdivisions, ports, hospitals/clinic, Government offices, and public facilities must be required to have their own SWM facilities (including a functional MRF and Composting Facility) in their respective development plans prior to the release of necessary permits.

CHAPTER – X
SOCIAL AND ENVIRONMENTAL ASPECTS

The City Government of Butuan along with the BCESWMB recognized that the 10-year ISWMP goes beyond the simple manner of providing infrastructure, technology, funds, equipment and knowledge. The plan was formulated with the notion of changing and transforming people's attitude and behaviour, emphasizing early on project planning and design that waste management is a personal 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 Aspect

The success indicator of every SWM IEC program will be waste diversion efficiency and waste minimization. Another indicator to consider is the number of households practicing proper waste segregation which suggests a notable change in the community's lifestyle. All policies of the government, whether those stipulated in R.A. 9003 or the LGU policy pertaining on "no segregation, no collection," will not be realized without the community's knowledge, acceptance, support and involvement to the SWM programs of the city government. All 86 barangays will be covered in the IEC campaign and set-up their own Citizens Monitoring and Feedback Mechanism (CMFM). Materials Recovery Facility (MRF) will also be established in every barangay.

The proposals for community based solid waste management have significant social impact with both positive and negative dimensions. The positive dimensions of a successfully implemented program include lower overall costs for the city, reduced environmental impact and longer SLF lifespan. Community-based solid waste management produces a more cohesive community that is more responsible for its resources and lifestyle. Negative impacts exist if overblown programs for recycling and composting do not materialize either due to a lack of markets or buyers for materials or other reasons such as:

(1) Participants will be discouraged and will be less likely to continue with, or become further involved with, source separation and recycling

(2) Significant expenditure could be wasted if programs are not successful, hence phasing of programs and pilot testing is advised for composting and recycling equipment and facilities.

(3) Waste materials, including putrescible materials, collected by barangay based organic fertilizer production facility operators and if not properly taken cared of

or processed immediately at the compost facility, may cause offensive condition in the community.

(4) Barangays could be saddled with expenses for handling and clean-up that they are unable to bear, since there is no guarantee that recycling activities can support even salaries for workers let alone extraordinary expenses. Barangay councils should carefully evaluate commitments to hire workers and enter into long term buying contracts if by so doing sustainability of the program can be assured.

(5) Variable markets and prices of recyclable materials can affect morale among households and supervisors at the barangay MRFs, and will need to be counteracted with education programs among participants and enduring relationships with waste buyers, based on formal buy-sell contracts.

(6) Any citywide facilities such as the proposed composting facility and the proposed landfill can of course exert significant negative social impact because of the NIMBY attitude, and the environmental assessment for these facilities should incorporate and consider social issues such as the relocation of the displaced scavengers at the dumpsite since it will be fully closed and rehabilitated.

Stakeholder Participation Requirements. Public participation is required in the drafting of the 10-year SWM Plan and the SWM program implementation including the SCRP of the Dulag and Doongan dumpsites. This is necessary to ensure transparency, accountability, ownership and social acceptability. Meanwhile, as required by PD 1586, public participation is required in the entire project cycle of the Dumalagan SLF upgrading and the construction of the Sorting, Recycling and Processing Plant.

A Multi-Partite Monitoring Team (MMT) will be organized following the completion of SWM Infrastructure Projects. This would ensure that the projects operate within the bounds of the ECC and in accordance with the Environmental Management Plan (EMP).

Waste Scavengers Welfare. Waste scavengers in the Dumalagan SLF will be profiled and assessed by the City Social Welfare and Development Office (CSWDO) through their respective Barangay Councils. This is necessary in order to identify and provide them with possible interventions, opportunities and livelihood programs. This will discourage them from entering the SLF. In addition, the scavengers can also be trained as deputized enforcers and barangay volunteers.

Personnel Welfare and Safety. City's waste collectors play vital role in effective and efficient implementation of SWM programs, projects and activities in every political boundary. Personnel welfare is necessary to ensure personnel safety in providing them protective and sanitary measures such as heavy duty protective

gears (Face Mask, Gloves, Boots, Type A and B uniform etc.) to avoid and protect waste collectors to any contact/exposure of possible dump infectious wastes during daily waste collection and waste management at SLF also by providing of monetary support such as hazard-pay considering daily risktasks operation that is very tangible. In addition, to conduct appropriate training on proper collection, transfer and disposal management to capacitate them in proper handling of collected waste.

10.2 Environmental Aspect

For the rehabilitation and final closure of the Barangay Doongan dumpsite, the DENR EMB issued Authority to Close (ATC) dated April 2012 approving the submitted safe closure & rehabilitation plan by the city based on the guidelines and standards of safe closure set by EMB-DENR Caraga Region through NSWMC Resolution No. 05, series of 2005 and DAO No. 09, series of 2006.

Barangay Dulag dumpsite was established and operated on February 2012. The City of Environmental and Natural office (CENRO) has ordered the closure of the said dumpsite last August 2016. Currently, the final closure and rehabilitation plan of the said dumpsite was already being formulated.

Butuan City's Dumalagan Controlled Sanitary Landfill (SLF) was established and became operational since June 29, 2016. The said SLF was issued with Environmental Compliance Certificate(ECC) No. *R13-0909-0016*. Meanwhile, a feasibility study is being conducted for the establishment of the Centralized waste recycling and processing plant (with installed waste converter).

The EMP for the SWM Program is to be implemented by the CENRO and is comprised, in general, of the tasks and responsibilities outlined in "Audit and Oversight". Internal training in monitoring, the recording and analysis of data, and response to environmental problems are intrinsic elements of the proposed EMP. What is being proposed is a plan for environmental management of the entire SWM operation of the City, and the enforcement of the plan placed in the hands of the City ENRO. This function concerns not only minimizing impact on the environment due to operations, such as the landfill, but maximizing environmental benefits consistent with reasonable cost of the overall SWM program. This is to be accomplished through public awareness and education, and through adjustment of methods to achieve the most workable combination for the City.

Direct impacts from ineffective waste reduction programs include increased consumer and SWM system costs, energy and resource wastage, and increased amounts of materials needing to be disposed of in landfills, or in lieu of that, being dumped illicitly. Direct impacts from ineffective collection programs include the presence of wastes left in streets and byways, or disposed of improperly in vacant lots, creek beds and roadside ditches.

In general, direct impacts from major facilities include those associated with construction and with operation of the facilities. Construction impacts are generally well documented and will need to be accounted for. Operational, and post-operational, impacts are generally associated with odors, disease vectors inclusive of flies, rodents, and insects, and ground and surface water quality deterioration resulting from inability to contain pollutants present in the waste that are mobilized in the presence of water. From both design and operational standpoints, control of water in all its forms is the most critical aspect of environmental protection at landfills, and to a lesser extent at compost facilities where materials are exposed to incident rainfall. Wherever possible wastes should be kept dry, and clean water should not be allowed to flow overland into facility (prevention of run-on) thus creating contaminated water, nor should contaminated water be allowed to flow out either into the groundwater system, or into the surface water system. The various factors mentioned above address these issues alongside others related to operations, such as impacts from transportation in the vicinity of landfills, noise and other factors (ECC, EGGAR, other safeguard tools and guidelines must be adhered).

CHAPTER – XI

COST ESTIMATES /FINANCIAL ASPECTS

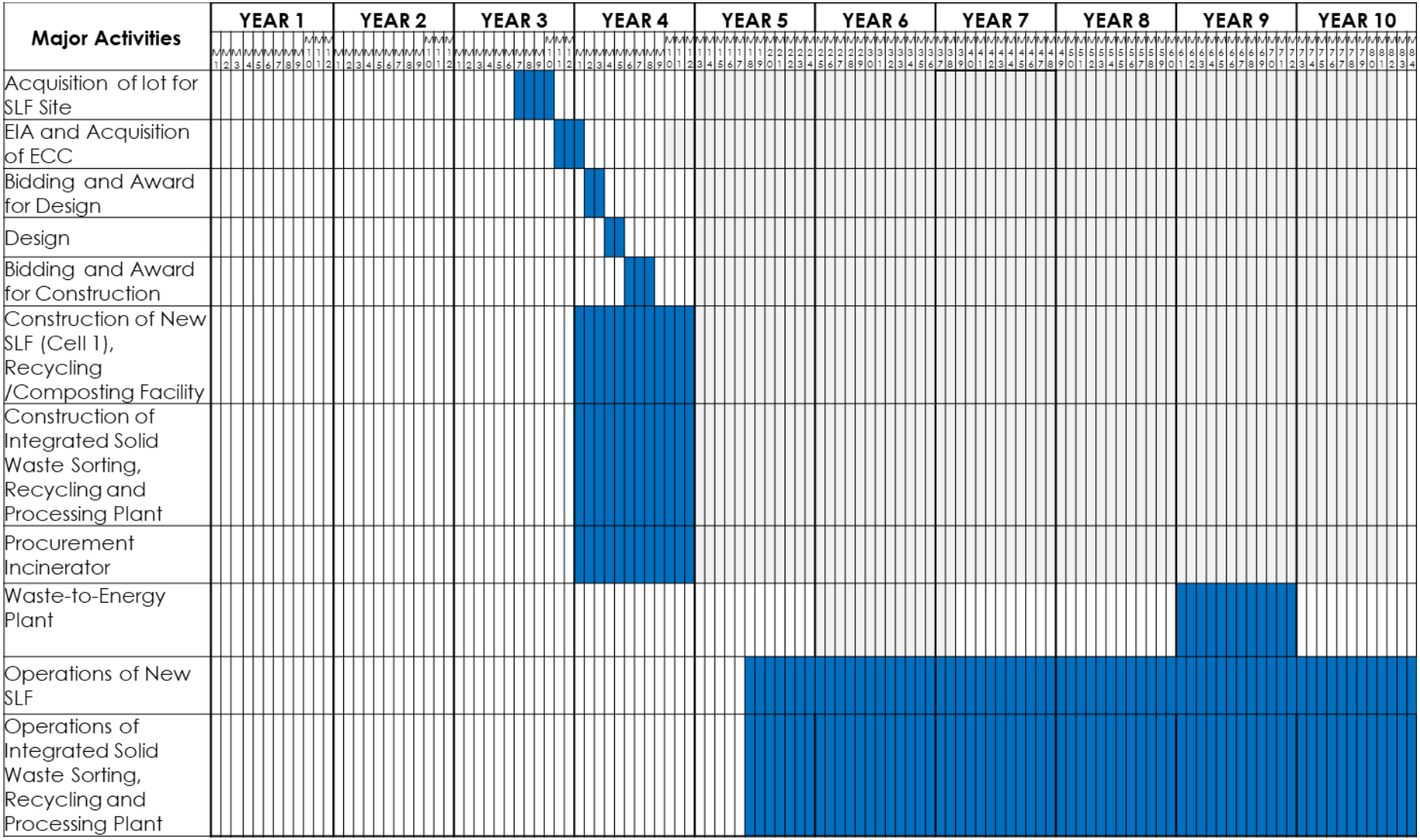
11.1 Investment Cost

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

Table 63. Shows the projected operational cost of the SWM Program of Butuan City.

Projects/Activities	Object Expenditures	Budgetary Required Per Year									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
1. WASTE DIVERSION											
Feasibility Study											
a. Integrated Solid Waste Facility	Capital Outlay	-	25,000,000								
b. Waste-to-Energy Plant	Capital Outlay	-	-	25,000,000							
Construction of Integrated Solid Waste Facility (Sorting and Recycling)											
a. Land Acquisition for SLF	Capital Outlay	-	-	50,000,000	45,000,000	-	-	-	-	-	-
b. SLF Construction including MRF Processing Plant	Capital Outlay	-	-	-	300,000,000	-	-	-	-	-	-

c. Incinerator	Capital Outlay	-	-	-	2,500,000	-	-	-	-	-	-
Waste-to-Energy Plant										1,000,000,000	
Establishment of 3 Clustered composting and Material Recovery Facilities											
a. Construction of composting and Material Recovery Facilities	Capital Outlay		10,000,000	20,000,000	20,000,000						
b. Acquisition of Dump Trucks and Waste Bins	Capital Outlay			15,000,000	20,000,000						
c. Purchase of Stationary Equipment (Compactor)	Capital Outlay			15,000,000	15,000,000						
2. Collection and Disposal	PS, MOOE, Capital Outlay	33,336,000.00	17,901,000.00	25,769,000.00	93,279,000.00	93,455,000.00	101,050,500.00	115,434,500.00	113,607,150.00	113,723,150.00	122,950,665.00
3. Information Education Campaign (IEC)	MOOE	-	195,000.00	215,000.00	230,000.00	251,000.00	266,500.00	288,600.00	311,305.00	335,280.50	351,935.50
4. Enforcement	MOOE Capital Outlay	-	1,900,000.00	3,050,000.00	2,100,000.00	1,950,000.00	4,100,000.00	2,650,000.00	3,100,000.00	4,000,000.00	3,350,000.00
5. Safe Closure & Rehabilitation Plan	Capital Outlay	5,000,000.00	10,000,000.00	10,000,000.00	-	-	-	-	-	20,000,000.00	-
TOTAL		**38,336,000.00**	**64,996,000.00**	**149,034,000.00**	**478,109,000.00**	**95,656,000.00**	**105,417,000.00**	**118,373,100.00**	**117,018,455.00**	**1,138,058,430.50**	**126,652,600.50**
Grand Total	**2,431,650,586.00**										


Major Activities
YEAR 1
YEAR 2
YEAR 3
YEAR 4
YEAR 5
YEAR 6
YEAR 7
YEAR 8
YEAR 9
YEAR 10
Acquisition of lot for SLF Site
EIA and Acquisition of ECC
Bidding and Award for Design
Design
Bidding and Award for Construction
Construction of New SLF (Cell 1), Recycling /Composting Facility
Construction of Integrated Solid Waste Sorting, Recycling and Processing Plant
Procurement Incinerator
Waste-to-Energy Plant
Operations of New SLF
Operations of Integrated Solid Waste Sorting, Recycling and Processing Plant

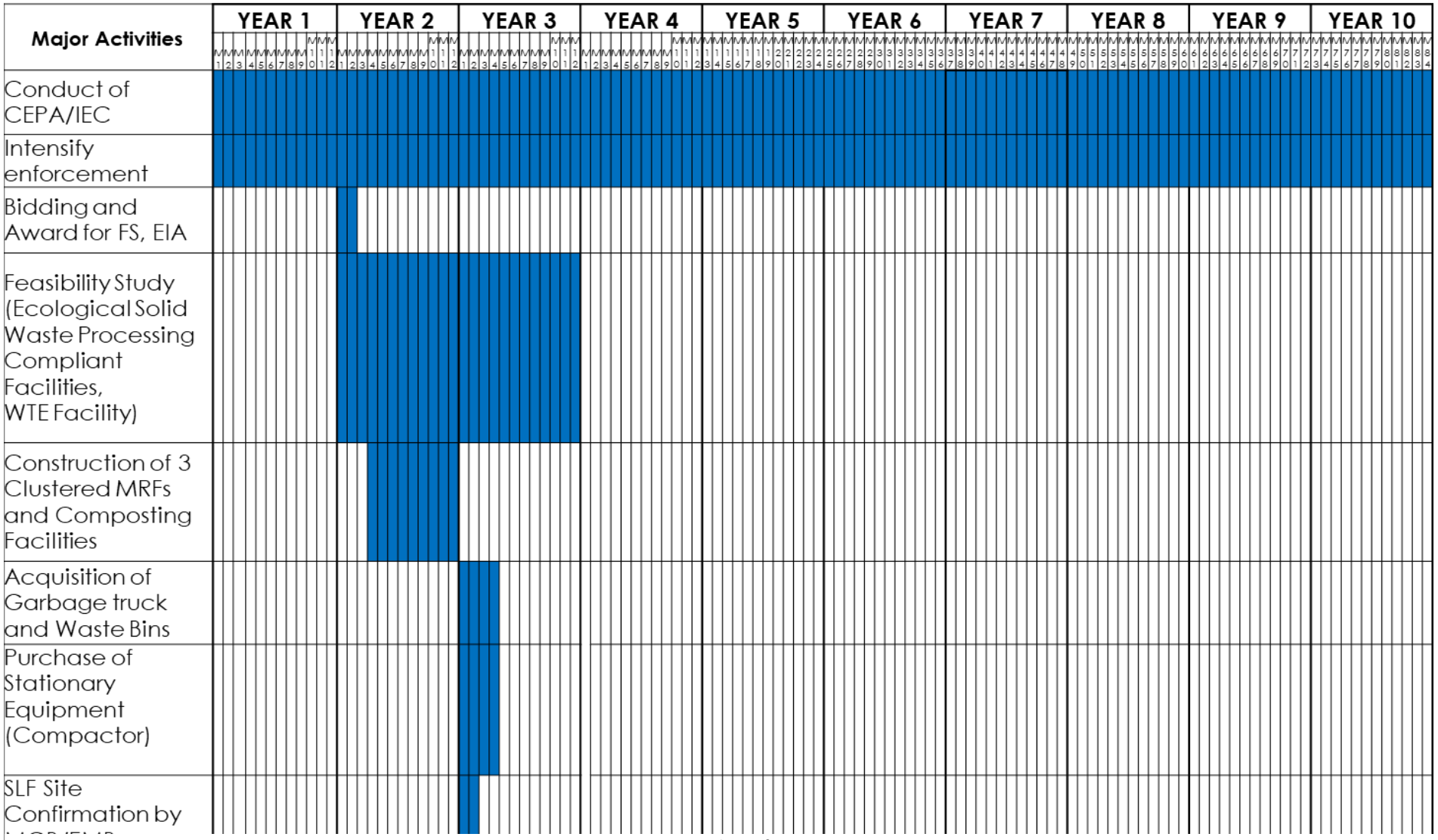


Figure 27.Gant Chart of Activities.

11.2 Annual Costs

Table 64. Annual budgetary allocation for SWM Program in Butuan City.

YEAR(S)	**BUDGETARY ALLOCATION** *(in millions, PhP)*			
	20% Development Fund (IRA)	Lump sum Appropriations	Other external sources	**TOTAL**
2014	6, 271,000.00			6,271,000.00
2015	1,000,000.00	10, 784, 700.00		11,784,700.00
2016	Based on available data no budget assistance from 20% City's IRA	11,060.700.00		11,060,700.00
2017		16,738,360.00		16,738,360.00
2018		11,662,600.00		11,662,600.00
2019		9,893,238.00		9,893,238.00

Source: City Budget Office

11.3 Butuan City SWM Budget Allocation, Revenue and Expenses

The average annual budget allocated for solid waste management in Butuan City is approximately P 9.4 million, representing 13 % of the city's internal revenue allotment (IRA) from 20% of Development Fund. The current annual budget is low relative to Butuan City's land area, population and rate of waste generation. The annual SWM budget could not cover the purchasing of new waste compactors and the upgrading of SWM facilities and services of the City ENRO. Table 65, Table 66 and Table 67 shows the average annual SWM budget, expenditure and revenue of Butuan City.

Table 65. Annual SWM Budget of Butuan City.

ITEM	**BUDGET ALLOCATIONS**			
	2015	**2016**	**2017**	**2018**
PS	3,115,148.00	3,381, 612.00	3,060,848	3,060,848
MOOE	5,958,927.00	1,370,503.74	16,660,310.00	11,200,220.22
CO	265,300.00	160,150.00	78,050.00	-
TOTAL	**9,339,375.00**	**4, 912,265.74**	**19,799,208.00**	**14,261,068.00**

Source: City ENRO, Butuan City.

Table 66. Average annual SWM expenditure of Butuan City.

COMPONENTS	ITEM	COSTS
Labor	Permanent Job Orders Casuals Contract of Service	3,314,988.445 5,669,240.25 0 216,000.00
Operation	Fuel and Oil Repair and Maintenance	5,605,149.90
Sanitary Landfill Facility (SLF)	Repair and Maintenance Additional Construction	250,000 (2015 Only)
Others	Special Projects Supplies and materials	1,430,837.05
	TOTAL	**16, 486, 215.65**

Source: City ENRO, Butuan City

.

Table 67. Annual SWM Revenue of Butuan City.

ITEMS	REVENUES COLLECTED				
	2014	2015	2016	2017	2018
Garbage Collection Charges	881,320.00	901,250.00	930,679.00	1,052,030.00	1,082,030.00
Anti-Littering	228,700.00	32,550.00	83,350.00	353,150.00	447,500.00
Anti-illegal Dumping					42,000.00
Others					
TOTAL	**1,110,020.00**	**933,800.00**	**176,419.00**	**1,405,180.00**	**1,571,530.00**

Source: City ENRO, Butuan City

11.4 Cost Evaluation and Comparison

Table 68 compares estimated SWM cost vis-à-vis projected revenues.

Table 68. SWM program cost evaluation and comparison.

YEAR	ESTIMATED SWM COST	PROJECTED REVENUES	PERCENT INCOME FROM THE COST
2011			
2012			
2013			
2014	6,271,000.00	1,110,020.00	0
2015	11,784,700.00	933,800.00	0
2016	4,976,744.00	1,014,029.00	0
2017	10,838,360.00	1,405,180.00	0

11.5 Summary

To finance capital investments, the City Government of Butuan has three principal options: loans from financial and banking institutions, national government grants such as the revenue allotment that often serve as collateral for loans, and municipal sinking funds backed by a cost recovery system. To finance recurring costs, the City Government can obtain funds from local taxes, intergovernmental transfer, and user charges. Local conditions will determine to what extent cost can be recovered; however, the City should attempt to recover in some part collection costs through user charges and voluntary fees. Recovery of collection costs requires introducing charges over a period of time in a manner acceptable to the public. Industrial and commercial enterprises view solid waste as a cost of doing business and require varied levels of service, thus they can be charged a variable fee that covers the full cost for the desired level of service.

Capital costs related to disposal may be recovered largely through intergovernmental transfers and loans based on broader environmental objectives; nevertheless, the substantial operating costs associated with sanitary disposal can also be charged back to the user, at least in theory. Actual charges levied against beneficiaries is likely to be based more on their willingness to pay than on the actual cost associated with providing the service, with the former always somewhat less than the latter. Significant gains in cost recovery will need to be accompanied by high performance standards, public education concerning the need for effective SWM, and public sector accomplishments in finance, accounting and budgeting.

CHAPTER – XII

PLAN IMPLEMENTATION

12.1 Phases and Responsibilities

The approved ESWM Plan of the city must pass through phases of revision and updating from a strategic instrument up to a guide for operations over a long-term period. A series of actions are necessary in order to obtain official acceptance – to adopt the Plan as a statement of intent for Butuan City --- and then to implement the Plan. In general, the following responsibilities can be assigned for advancing the Plan through these phases. Table 69 shows the phases and responsible agencies for the ESWMP implementation.

Table 69. Phases and responsibilities.

SWM PROGRAM COMPONENTS	OFFICE/PERSON RESPONSIBLE
(1) Conduct of Feasibility Study a. Integrated Ecological Solid Waste Processing Compliant Facility b. Waste to Energy Facility	City ENRO, CEO
(2)Establishment of Integrated Ecological Solid Waste Processing Compliant Facility Site Assessment Site Acquisition Preliminary Site development and permit procedure Procurement Site development Site operation	City ENRO, City Engineering, City Procurement & Mgt. Services Office
(3)New Centralized MRF and Clustered MRF and Composting Facilities Site Assessment Site Acquisition Preliminary Site Development and Permit Procedure Site Development Site Operation ✓ MRF Final segregation and sorting ✓ Composting of biodegradable materials ✓ Processing of recyclable materials ✓ Landfilling of residuals ✓ Environmentally-sound disposal of hazardous and special wastes	City ENRO, CEO, City Procurement & Mgt. Services Office

✓ Environmentally-sound disposal of biodegradable hospital wastes ✓ Conversion of Plastic and residual wastes to energy ✓ Monitoring of underground water contamination ✓ Material quality control	
(4) Acquisition of Alternative Technology and Equipment (Compactors, Plastic Shredder, Glass Pulverizer, Bottle Crusher)	City ENRO, CGSO, City Procurement & Mgt. Services Office
(5) Construction of New SLF Site Assessment Site Acquisition Preliminary Site development and permit procedure Procurement Site development Site operation	City ENRO, CEO, City Procurement & Mgt. Services Office
(6) Construction of Waste to Energy Processing Facility Site Assessment Site Acquisition Preliminary Site development and permit procedure Procurement Site development Site operation	City ENRO, CEO, City Procurement & Mgt. Services Office
(7)Systematic Collection System Baseline collection of data on current collection schedules, routes and fuel consumption Change collection schedules and routes Workout a cost-effective route and schedule for the City's garbage collection Follow-up and monitor compliance of collection route schedule	City ENRO, ESWMD

Briefing of collection crew for systematic implementation of No segregation, No collection policy Purchasing and distribution of the 45 dump trucks Solid Waste must be transported and dumped directly to prescribed facility- either at a Transfer Station or Materials Recovery Facility (MRF) Every collection is required to have a trip ticket indicating the barangay and route the trip will cover	
(8) Institutionalize ESWM Capacity-building and Education Inclusion and Implementation of environmental education and advocacy programs in school curricula. Environmental advocacy campaigns of 9 Stakeholders; ✓ Subdivision ✓ Gov't Offices/RLAs/ Province ✓ Schools ✓ Establishments/Commercial/Hotels ✓ Utilities ✓ Sari-sari/ SME's/ Households (Barangay) ✓ Church ✓ Hospitals ✓ Industries Facilitate coordinative and logical follow through support pertaining to ESWM IEC initiatives for the 86 constituent barangays of Butuan City Preparation course of all MRF operators	City ENRO, GGWMP
(9) Monitoring and Evaluation (quarterly) Development of the ESWM compliance monitoring and evaluation tool. Preparation of resolution adopting the ESWM Compliance Evaluation Tool	City ENRO, GGWMP

Development of the Community-based Monitoring Instrument Barangay ESWM Plan Action Planning and Workshop	
(10) Enforcement and Compliance Preparation in the conduct of meetings/seminars with Barangay Kagawads on Environment. Preparation in the conduct of meetings/seminars with Deputized Enforcers and Barangay Bantay Kahinlo Brigade Volunteers (BBKBV). Identification of all enforcement groups and introduction seminars and workshops on SWM legal basis in 9 stakeholders ✓ Subdivision ✓ Gov't Offices/RLAs/ Province ✓ Schools ✓ Establishments/Commercial/Hotels ✓ Utilities ✓ Sari-sari/ SME's/ Households (Barangay) ✓ Church ✓ Hospitals ✓ Industries Conduct paralegal trainings/seminars for enforcement of the City's SWM Ordinance and other related and similar issuances. Implementation of the Recycling Action Program. Issuance of environmental clearance and intensified enforcer in legal basis	City ENRO, GGWMP and EPPD

12.2 Milestones

The milestones for implementing the 10-year ISWM Plan is to strengthening of the Ecological Solid Waste Management Division under the City ENRO, initiating the barangay recycling program and achievement of the proposed waste diversion targets, closure of the existing dumpsites and inauguration and full operation of the new sanitary landfill in 2016.

Institutions and Fiscal Management action items include the pivotal milestone for the operation of the ESWMD under the Office of the City ENRO. Actual staff and administrative structure of ESWMD should be reviewed to include appointment of the Recycling Program Planner (RPP), a part time position that can be filled by existing staff alongside with other ongoing duties. Another institutional function is the Audit and Oversight function that will need to be fully developed and operational. Financial elements include the Rate Analysis and the implementation of a Cost Recovery Scheme, expected to be underway within two years.

Public Participation and Education involve the Barangay meetings aimed at formulation of the local recycling and composting components of the Plan. Implementation of the barangay components is essential and depends heavily on consistent application of the public education component. The Green Ground Zero Waste Program should strengthen public education effort at every step in its development, even as it is primarily responsible for its implementation. Programs in school were already underway of giving information and education campaign need to be continued and strengthening.

The Waste Diversion Program encompasses a great variety of activities that described in the Plan. Most of these carried out continuously though some have both initial (strategic) and (long term (tactical) aspects. Source Reduction has both initial and continuous aspects as do the Diversion Targets (Yr-1 thru Yr-5) in general. Recycling depends on an initial thrust to setup MRFs, initiate changes in building codes, and develop a marketing strategy, with attention to the continuous task of household segregation. The plan also calls for a Centralized MRF near the SLF as well as setting up of a clustered central composting facility in the barangays.

Several workshops and seminars pertaining to SWM was already been conducted in the barangay level. An ESWM Compliance Evaluation and Monitoring Tool were already been tested, modified and adopted by the different barangay councils. Moreover, the collection and disposal action items involve improving the collection fleet and expanding the service area extending the useful lifespan of the new SLF until an alternative site can be put into use, then closure.

12.3 Implementation Schedule

The plan is intended to cover a 10-year planning time frame. The design capacity of the landfill should accommodate the total quantity of waste generated up to 2026. Table 70 shows the implementation action schedule of all SWM programs and activities.

Table 70. ESWMP IEC implementation action plan.

ACTIVITY	TARGET AUDIENCE	MESSAGE	METHOD	TIMEFRAME
Reorientation on RA 9003	Stakeholders; ✓ Subdivision ✓ Gov't Offices/ RLA's/Province ✓ Schools ✓ Establishments/Commercial/ Hotels, ✓ Utilities ✓ Sari-sari/ SME's/Household (Barangays) ✓ Church, Hospitals and Industries	Increase awareness relative to the role of the barangay and effective implementation of the ESWM program of the school and stakeholders	Seminar, lecture	Every Quarter
	City ENRO staffs	Increase awareness relative to the salient features of the law	Seminar, lecture	
Evaluation of the Butuan City Search for the Most Environment Friendly Barangays	86 Barangays	Ensure the sustainability and efficacy of the SWM programs of the 86 barangays	Interview, Site Inspection and coaching by the evaluators	Annual
Evaluation of the Butuan 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, Site Inspection and coaching by the evaluators	Annual
Massive Barangay Clean-up relative to the Earth Day Celebration and Mangrove planting	86 Barangays	To find possible solutions to the problematic areas within their respective barangays	Actual clean-up drive	Every 22nd of April and quarter

Localized Environment Week Celebration	86 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	86 Barangays	Plastic waste minimization	Record, Store to Store Campaign, Video Presentation, Lecture/seminar	Quarter

Table 73. ESWMP Implementation action plan.

SWM PROGRAM COMPONENTS	OFFICE/PERSON RESPONSIBLE	TIMEFRAME
(1) Conduct of Feasibility Study a. Integrated Ecological Solid Waste Processing Compliant Facility b. Waste to Energy Facility	City ENRO, CEO	2021 2022
(2)Establishment of Integrated Ecological Solid Waste Processing Compliant Facility Site Assessment Site Acquisition Preliminary Site development and permit procedure Procurement Site development Site operation	City ENRO, City Engineering, City Procurement & Mgt. Services Office	2022-2023
(3)New Centralized MRF and Clustered MRF and Composting Facilities Site Assessment Site Acquisition Preliminary Site Development and Permit Procedure Site Development Site Operation ✓ MRF Final segregation and sorting ✓ Composting of biodegradable materials	City ENRO, CEO, City Procurement & Mgt. Services Office	2022-2023

✓ Processing of recyclable materials ✓ Landfilling of residuals ✓ Environmentally-sound disposal of hazardous and special wastes ✓ Environmentally-sound disposal of biodegradable hospital wastes ✓ Conversion of Plastic and residual wastes to energy ✓ Monitoring of underground water contamination ✓ Material quality control		
(4) Acquisition of Alternative Technology and Equipment (Compactors, Plastic Shredder, Glass Pulverizer, Bottle Crusher)	City ENRO, CGSO, City Procurement & Mgt. Services Office	2022-2023
(5) Construction of New SLF Site Assessment Site Acquisition Preliminary Site development and permit procedure Procurement Site development Site operation	City ENRO, CEO, City Procurement & Mgt. Services Office	2023
(6) Construction of Waste to Energy Processing Facility Site Assessment Site Acquisition Preliminary Site development and permit procedure Procurement Site development Site operation	City ENRO, CEO, City Procurement & Mgt. Services Office	2028
(7)Systematic Collection System Baseline collection of data on current collection schedules, routes and fuel consumption Change collection schedules and routes Workout a cost-effective route and schedule for the City's garbage collection	City ENRO, ESWMD	2020-2029

Follow-up and monitor compliance of collection route schedule Briefing of collection crew for systematic implementation of No segregation, No collection policy Purchasing and distribution of the 45 dump trucks Solid Waste must be transported and dumped directly to prescribed facility-either at a Transfer Station or Materials Recovery Facility (MRF) Every collection is required to have a trip ticket indicating the barangay and route the trip will cover		
(8) Institutionalize ESWM Capacity-building and Education Inclusion and Implementation of environmental education and advocacy programs in school curricula. Environmental advocacy campaigns of 9 Stakeholders; ✓ Subdivision ✓ Gov't Offices/RLAs/ Province ✓ Schools ✓ Establishments/Commercial/Hotels ✓ Utilities ✓ Sari-sari/ SME's/ Households (Barangay) ✓ Church ✓ Hospitals ✓ Industries Facilitate coordinative and logical follow through support pertaining to ESWM IEC initiatives for the 86 constituent barangays of Butuan City Preparation course of all MRF operators	City ENRO, GGWMP	2020-2029

(9) Monitoring and Evaluation (quarterly) Development of the ESWM compliance monitoring and evaluation tool. Preparation of resolution adopting the ESWM Compliance Evaluation Tool Development of the Community-based Monitoring Instrument Barangay ESWM Plan Action Planning and Workshop	City ENRO, GGWMP	2020-2029
(10) Enforcement and Compliance Preparation in the conduct of meetings/seminars with Barangay Kagawads on Environment. Preparation in the conduct of meetings/seminars with Deputized Enforcers and Barangay Bantay Kahinlo Brigade Volunteers (BBKBV). Identification of all enforcement groups and introduction seminars and workshops on SWM legal basis in 9 stakeholders ✓ Subdivision ✓ Gov't Offices/RLAs/ Province ✓ Schools ✓ Establishments/Commercial/Hotels ✓ Utilities ✓ Sari-sari/ SME's/ Households (Barangay) ✓ Church ✓ Hospitals ✓ Industries Conduct paralegal trainings/seminars for enforcement of the City's SWM Ordinance and other related and similar issuances. Implementation of the Recycling Action Program. Issuance of environmental clearance and intensified enforcer in legal basis	City ENRO, GGWMP and EPPD	2020-2029

“Annexes”

1. NSWMC Resolution No. 756-A series of 2020
2. SP Resolution No. 438-2020
3. BCESWMB Board Resolution No. 3 Series of 2019

Office of the President
NATIONAL SOLID WASTE MANAGEMENT COMMISSION
Department of Environment and Natural Resources
2nd Flr. HRDS Bldg., DENR compound, Visayas Avenue, Diliman, Quezon City, 1100
Tel. Nos. (632) 920-2252 / 920-2279

NSWMC Resolution No. 756-A series of 2020

RESOLUTION APPROVING THE TEN YEAR SOLID WASTE MANAGEMENT PLAN OF BUTUAN CITY

WHEREAS, the National Solid Waste Management Commission ("the Commission") is composed of fourteen (14) members from the National Government Agencies (NGAs) and three (3) members from the private sector in accordance with the provision of Republic Act No. 9003, otherwise known as the Ecological Solid Waste Management Act of 2000 ("the Act");

WHEREAS, Section 10 of RA 9003 provides that Local Government Units (LGUs) shall be primarily responsible for the implementation and enforcement of the provisions of the Act within their respective jurisdictions;

WHEREAS, Section 16 of RA 9003 requires provinces, cities and municipalities through their local Solid Waste Management Boards, to prepare their respective 10-year Solid Waste Management Plans (SWMP) consistent with the National Solid Waste Management Framework and in accordance with the provisions of the Act and the policies set by the National Solid Waste Management Commission;

WHEREAS, Section 16, of RA 9003 also provides that all LGU SWM Plans shall be subject to the approval of the NSWMC;

WHEREAS, NSWMC Resolution 39, series of 2009 entitled Resolution Amending NSWMC Resolution No. 8 entitled "Guidelines on the Review and Approval of the 10-year SWM Plans of LGUs' was approved on October 09, 2009 by then DENR Secretary Hon. Jose L. Atienza;

WHEREAS, after (a) thorough review and evaluation by the NSWMC Secretariat, the NSWMC-ExeCom, in a meeting on December 3, 2020, has agreed to endorse for the approval of the NSWMC En Banc, the 10-year SWM Plan (2020-2029) of Butuan City;

NOW, THEREFORE, BE IT RESOLVED, AS IT IS HEREBY RESOLVED, that the 10-year SWM plan of the said LGU be approved and be made available to the public upon request.

FURTHER, it is hereby resolved that LGU Butuan be required to submit the final version of the plan, with a Sangguniang Bayan Resolution and an annual progress report on the strategies implemented, as well as the accomplishments, to the National Solid Waste Management Commission, through its Secretariat. In the event a new set of officers is elected, a proper turn-over shall be undertaken by the LGU to the newly-elected officials who shall notify the Commission on the progress of the turn-over.

FURTHERMORE, the NSWMC may revoke the approval of the plan if upon monitoring, non-compliance with the law and the 10-year plan are evident.

This resolution takes effect upon approval.

APPROVED on the **9th day of December 2020.**

BENNY D. ANTIPORDA
Undersecretary for Solid Waste Management
and Local Government Units Concerns, DENR
Alternate to the Chairman, NSWMC

Waste No More! Waste No Time!

Republic of the Philippines
TANGGAPAN NG SANGGUNIANG PANLUNGSOD
Lungsod ng Butuan

20_12160

15th Sangguniang Panlungsod
46th Regular Session
Series of 2020

A RESOLUTION APPROVED BY THE HONORABLE SANGGUNIANG PANLUNGSOD OF THE CITY OF BUTUAN IN ITS REGULAR SESSION HELD AT THE SP SESSION HALL ON NOVEMBER 17, 2020

PRESENT:

Honorable Jose S. Aquino II	*- City Vice Mayor, Presiding Officer*
Honorable Glenn C. Carampatana	*- Member*
Honorable Ferdinand E. Nalcot	*- Member*
Honorable Derrick A. Plaza	*- Member*
Honorable Cromwell P. Nortega	*- Member*
Honorable Rema E. Burdeos	*- Member*
Honorable Ehrnest John C. Sanchez	*- Member*
Honorable John Gil S. Unay, Sr.	*- Member*
Honorable Joseph Omar O. Andaya	*- Member*
Honorable Cherry May G. Busa	*- Member*
Honorable Vincent Rizal C. Rosario	*- Member*
Honorable Gemma P. Tabada	*- Member, President, Liga ng mga Barangay*
Honorable Cynth Zephanee N. Nietes	*- Member, SK Federation President*

ABSENT:

None

The session was called to order at exactly 11:32 in the morning.

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SP RESOLUTION NO. 438-2020

A RESOLUTION APPROVING AND ADOPTING THE TEN-YEAR INTEGRATED SOLID WASTE MANAGEMENT PLAN (ISWMP) OF BUTUAN CITY, AND FOR OTHER PURPOSES

WHEREAS, presented before the Honorable Sangguniang Panlungsod (SP), as indorsed by the Honorable City Mayor Ronnie Vicente C. Lagnada per letter dated November 16, 2020, received by the SP Office on the same date, is the final draft of the Ten-Year Integrated Solid Waste Management Plan (ISWMP) of the City of Butuan;

WHEREAS, the ISWMP is prepared to address several issues on the City's Solid Waste Management System, resolve the existing gaps related to the implementation of Republic Act No. 9003, also known as the ***Ecological Solid Waste Management Act of 2000***, and provide the mechanisms and strategies to minimize waste generation through waste diversion and introduction of solid waste management (SWM) technologies to achieve and institutionalize a better SWM system that will not only ensure the quality of life of all stakeholders, but also preserve the integrity of a balanced ecological system;

WHEREAS, the ISWMP aims to establish an integrated waste-to-energy facility in the City where all waste shall be diverted to energy, and eventually, avoid costly construction and operation of a sanitary landfill facility (SLF) in the future; for the meantime though, the ISWMP shall implement strategies that address existing issues and concerns, such as the following: (1) Establishment of Ecological Solid Waste Processing Compliant Facility; (2) Intensified IEC trainings on all SWM stakeholders; (3) Strict enforcement of existing SWM laws, policies, ordinances, and other related issuances; (4) Strengthened monitoring and evaluation of SWM compliance of constituent barangays with RA 9003 and provision of incentives and awards system for best practices in the barangays; (5) Expansion of waste collection services; (6) Conversion of SLF to sorting, recycling, and processing plant; (7) Provision of sufficient number of equipped enforcers; and (8) Ensuring of budget allocation for SWM equipment and facilities;

WHEREAS, the ISWMP is prepared pursuant to Sections 12 and 16 of RA 9003, which mandate every LGU to prepare its respective 10-year ISWMP, consistent with the provisions of the national solid waste management framework, and implement the same to ensure the efficient management of solid waste generated within its jurisdiction;

WHEREAS, upon review of the subject ISWMP, the Honorable SP finds the same most advantageous, and even crucial, for the City Government to implement to substantially solve the solid waste concerns of the present and materialize its vision of a city that is clean and salubrious for its people to live in.

NOW THEREFORE, upon motion of Honorable John Gil S. Unay, Sr., duly seconded by Honorable Derrick A. Plaza, be it –

RESOLVED, to approve and adopt the **TEN-YEAR INTEGRATED SOLID WASTE MANAGEMENT PLAN OF BUTUAN CITY (ISWMP).**

RESOLVED FURTHER, to furnish copies of this Resolution the Offices of the City Mayor, the City Administrator, the City Legal Officer, the City Planning and Development Coordinator, the City Budget Officer, and the City Environment and Natural Resources Officer, and the City Public Information Office, for information and appropriate action.

Unanimously Approved
Date: November 17, 2020

I hereby certify to the correctness of the foregoing Resolution.

LILIA B. CANLAS
City Government Assistant Department Head II
Assistant City Secretary
OIC - City Secretary

ATTESTED:

JOSE S. AQUINO II
City Vice Mayor
Presiding Officer

Authors:	*Hon. Vice Mayor Jose S. Aquino II*
	Hon. Joseph Omar O. Andaya
Co-authors:	*Hon. Glenn C. Carampatana*
	Hon. Ferdinand E. Nalcot
	Hon. Derrick A. Plaza
	Hon. Cromwell P. Nortega
	Hon. Rema E. Burdeos
	Hon. Ehrnest John C. Sanchez
	Hon. John Gil S. Unay, Sr.
	Hon. Cherry May G. Busa
	Hon. Vincent Rizal C. Rosario
	Hon. Gemma P. Tabada
	Hon. Cynth Zephanee N. Nietes
Movant:	*Hon. John Gil S. Unay, Sr.*
Seconder:	*Hon. Derrick A. Plaza*

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Republic of the Philippines
OFFICE OF T HE CITY MAYOR
BUTUAN CITY ECOLOGICAL SOLID WASTE MANAGEMENT BOARD
Butuan City

Board Resolution No. 3 Series of 2019

A RESOLUTION ADOPTING THE FINAL DRAFT OF BUTUAN CITY'S INTEGRATED SOLID WASTE MANAGEMENT PLAN (2019-2028)

WHEREAS, Section 16, Paragraph 1 of RA 9003 states that "the province, city or municipality, through its local solid waste management boards, shall prepare its respective 10-year solid waste management plans consistent with the national solid waste management framework.....";

WHEREAS, Section 16, Paragraph 3 of RA 9003 stipulates that "all local solid waste management plans shall be subjected to the approval of the National Solid Waste Management Commission";

WHEREAS, Requirement No. 2 under Environmental Management for the Seal of Good Local Governance being given by DILG is having an approved 10-year Solid Waste Management Plan;

WHEREAS, The Integrated Solid Waste Management Plan (2019-2028) provides a long term strategy for an effective and efficient SWM Program for the City;

NOW THEREFORE, upon motion of Engr. Richard N. Sevilla, duly seconded by Atty. Noel Ephraim R. Antigua, be it –

RESOLVED, that the final draft of Butuan City's Integrated Solid Waste Management Plan (2019-2028) is hereby adopted by Butuan City Ecological Solid Waste Management Board (BCESWMB);

RESOLVED FINALLY, to submit Butuan City's Integrated Solid Waste Management Plan (2019-2028) to National Solid Waste Management Commission for approval.

Unanimously Approved

Date Enacted: 12/23/2019
Date Approved: _____

APPROVED:

HON. JOSEPH OMAR O. ANDAYA
Chairman, SP- Committee on Environment
BCESWMB Vice-Chairman, Acting Presiding Officer