Good Practice Investigation and Documentation of the Integrated Sustainable Waste Management (ISWM) Project of Tagbilaran City, Bohol Province

I. CONTEXT AND BACKGROUND

The capital city of Bohol province, Tagbilaran city is about six hundred thirty kilometers (630 kms.) southeast of Metro Manila. On 01 July 1966, the city of Tagbilaran became a chartered city by virtue of Republic Act (RA) 4660. It has a total land area of 3,270 hectares (about 327 sq. kms). A third class city, it consists of fifteen barangays with a total population of 77,700 in 2000 (NSO, 2000). Also, NSO (2000) figures shows that about 31,493 or 40.53% of the total city population are living in urban areas while 46,207 or 59.47% are in the rural areas.

Tagbilaran city boasts of its role as Bohol province's *"gateway of development"* (CEP, 1999). As a major eco-tourism destination, the city has achieved significant progress and economic development. To support the province's eco-cultural tourism and agro-industrialization, the city provides necessary services, economic structures as well as infrastructure to the entire island of Bohol. It is the province's center of trade and commerce (10-Year ISWM Plan, 2004). In fact, it hosts most of the province's airport, major sea and fish port, government offices, educational institutions, hospitals, hotels, and even leading departments stores.

The City is blessed with natural resources as well as a rich cultural and historical heritage. For example, nine barangays of the city are coastal barangays. The city has an approximate coastline distance of about thirteen (13) kms. Many residents rely on fishing as their income source. Tagbilaran also source some of its potable water requirements from aquifers/groundwater. Although the city does not have a forest area, it was able to maintain greenbelt areas such as small tree farms near schools and in some private lots as well as a park near the town center. Finally, Tagbilaran city hosts a number of tourism related services and activities. It has the Banat-I Hills, Eilley Hill, a mangrove plantation in Manga and Bool and a few caves in Cabawan. The famous marker of the Blood Compact between datu Sikatuna and Miguel Lopez de Legaspi can be found in Boot District.

Tabilaran City: Facts and Figures

Barangay Composition

Tagbilaran city has a total of 15 component barangays, four (4) of which are considered highly urbanized and these are Brgys. Cogon, Poblacion I, II, and III (see Figure 1.).

Geological Features

Tagbilaran City is generally underlayed with limestone formation made up of strata of variable porosity and permeability (10-Yr. ISWM Plan, 2004). There are a number of sinkholes, caverns and solution channels in some parts of the city. Figure 1.2.2 shows the location of sinkholes in the city.

The city is unable to meet the requirements for a Sanitary Landfill Facility (SLF) as provided in Republic Act 9003 (otherwise known as the Ecological Solid Waste Management Act of 2000) due to the presence of sinkholes especially those located in barangay Dampas where the existing dumpsite is located. Coupled with the fact that the underlying limestone formation of the city does not meet the minimum permeability requirement (i.e., $1x10^{-6}$ cm/sec.) for SLF liners, the city government would need a considerable amount in engineering works in order to undertake a SLF project.

City Population

The population of Tagbilaran city has significantly increased during the last 3 decades as shown in Table 1 below. In the year 2000, the city's population of 77,700 is about 6.82 percent of Bohol's total population. This makes Tagbilaran city as the province's most populated city, followed by the municipalities of Ubay with 5.25% and Talibon with 4.75% of the total population of the province of Bohol (NSO, 2000). The 3.46% growth rate of the city is even higher than the Bohol province's growth rate of 2.95% (NSO, 2000).

Table 1. Total Population of Tagbilaran City (1970-2000)

Year	Population	Total Increase	Average Growth Rate (%)
1970	33,005	12,755	4.89
1975	37,335	4,330	2.47
1980	42,683	5,348	2.68
1990	56,363	13,680	2.78
1995	66,683	10,320	3.36
2000	77,700	11,017	3.46

Source: NSO in Table 3.a. Actual vs Projected Population of Tagbilaran City, pp. 18, 10-Yr. ISWM Plan, 2004

The city's population can be expected to reach 104,360 by the year 2010 with the current growth trend. Table 2below provides the population forecast for the year 2003-2010. It is to be noted that the figures are NSO population projections.

Table 2. Population Forecast of Tagbilaran City

Year	Population	Total Increase	Average Growth Rate (%)
2003	85,768	2,694	3.24
2004	88,472	2,704	3.15
2005	91,176	2,704	3.06
2006	93,812	2,363	2.89
2007	96,447	2,635	2.81
2008	99,089	2,642	2.74
2009	101,724	2,635	2.66
2010	104,360	2,635	2.59

Source: NSO in Table 3.a. Actual vs Projected Population of Tagbilaran City, pp. 18, 10-Yr. ISWM Plan, 2004

Economic Activities and Sectors

Since Bohol province is a major tourist destination in the Visayas region, Tagbilaran city attracts an influx of tourists. As a prime tourist destination, the city alone has at least nine (9) tourist attractions that vary from ecology, heritage and culture. The tourism industry has enticed investors, both local and foreign, and this meant an increase in business activities such as transport, hotels, as well as other service related establishments.

Thus, Tagbilaran city has become a center for trade and commerce. To illustrate this, the 10-year ISWM Plan (2004) recorded about 3,216 business establishments from various categories like convenience stores (980 registered stores which is equivalent to 30% of the total number of establishments), malls (there are about 5 of such macro establishments including the newly constructed Island City Mall), public market, and other small and medium enterprises. The number of business establishments has increased by about 24% from 1998 (10-Yr. ISWM Plan, 2004).

The city's agriculture sector includes such activities like farming, marine-based aquaculture, fishery production, and livestock and poultry production. The city has about 1,046 hectares of agricultural land. However, only about 33.6% (35.2 has.) are actually used for farming/cropping. Also, people who are involved in farming comprise only 3.5% (2,662 farmers) of the city's populace (10-Yr. ISWM Plan, 2004). In addition, the establishment of a multi-million livestock complex in Barangay Tiptip proved that the livestock and poultry is fast becoming a profitable business venture.

ISWM Situational Analysis

The city's geological characteristics, urban structure, increasing population and economic activities have put tremendous pressure on the issue of solid waste management. For example, the influx of students and workers of various private and public schools in the city especially during school season as well as the arrival of local and foreign tourists during vacation time has contributed to the increase in waste generators.

The burgeoning population and rapid urbanization has inadvertently contributed to the problem of solid waste management. The city's populace has identified a number of ways of disposing their garbage. Majority of the residents' garbage are picked up by dump trucks of the city government and brought to the dumpsite in Dampas district. Table 1.3.1 shows the usual manner of garbage disposal of the residents and establishments in the city.

Table 3. Usual Manner of Garbage Disposal of Households in Tagbilaran City

Manner of Garbage Disposal	Number of Households
Picked up by Garbage Truck	11,647
Dumping in Individual Pit (Not Burned)	906
Burning	2,349
Composting (Later used as Fertilizer)	175
Burying	102
Feeding to Animals	385
Others	21
T O T A L	15,585

Source: NSO Census of Population and Housing, 2000. Note: Figures are estimates based on a 10% sample

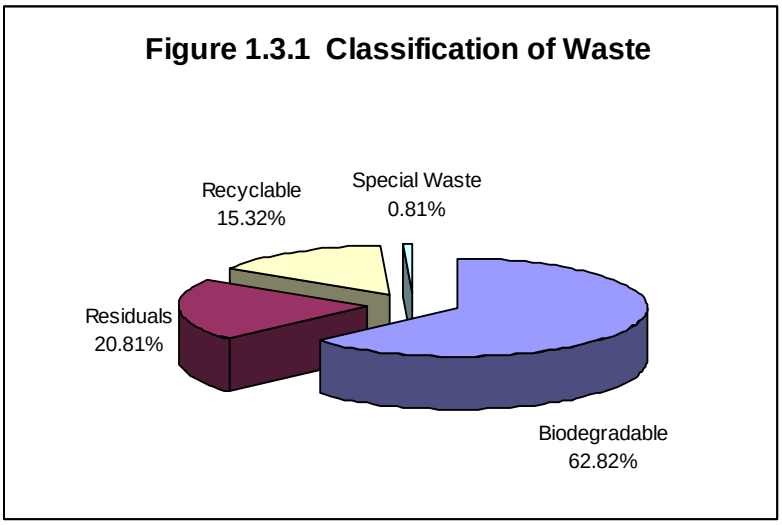
The city generates about 92.6 tons (92,668 kgs.) of solid waste daily. Households are the biggest waste generators with 38.5 tons (41.46% of the total volume of waste). They are followed by general merchandise stores with 15.5 tons and the public markets with 14.6 tons per day. Table 4 shows the sources and composition of city wastes.

Table 4. Waste Generation and Composition

Source	Weight (kg/day)	Percent (%)	Waste Composition (kg/day)			
			Biodegradable	Recyclable	Residual	Special waste
Residential	38,513.9	41.56	25,826.5	3,286.6	8,881.2	537.6
General Stores	15,533.6	16.76	6,446.0	5,354.9	3,362.9	95.5
Public Market	14,611.9	15.77	10,500.1	1,631.5	2,419.7	56.8
Institutions	9,133.0	9.86	5,810.2	2,342.8	979.4	0
Service Center	8,275.1	8.93	6,173.3	610.0	1,494.3	0
Special waste	4,059.4	4.38	2,057.1	649.1	1,311.6	39.2
Food Establishment	1,794.6	1.94	1,025.0	147.0	658.1	5.7
Industries	697.2	0.75	366.1	146.9	169.5	14.6
Recreation Center	27.0	0.03	0	27.0	0	0
Slaughter House	22.6	0.02	12.2	1.8	9.0	0
TOTAL	92,668.3	100.00	58,216.5	14,197.6	19,285.7	749.4

Source: Table 3.c Current Waste Generation for City of Tagbilaran, pp. 22, 10-Yr. ISWM Plan, 2004

Tagbilaran city's waste generation is expected to reach about 131,325 tons by the year 1014 with the current annual population and economic growth rates (10-Yr. ISWM Plan, 2004). Majority or 62.8% of the waste generated by the city are classified as biodegradable. Residential and public market sources account for most of the biodegradable wastes.



The waste characterization study revealed that each person in the city generates about 0.45 kg. of waste every day in their places of residence. The national figure is 0.6 kg./day/person (10-Yr. ISWM Plan, 2004). In addition, the city residents generates about 0.46 kg./day outside their residences, i.e., at workplaces, parks, schools, stores, etc. This means that the city populace produces waste both inside and outside their homes with a gross per capita of about 0.91 kg./day.

The result of the analysis of the waste taken to the dumpsite (end-of-pipe) revealed that about 51% are biodegradable, 25% are recyclable and about 23.7% are classified as residuals. Table 5 shows the composition and weight of end-of-pipe waste. It further revealed that about 76% (biodegradable and recyclable) of the total waste taken to the dumpsite is viable for diversion (10-Yr. ISWM Plan, 2004).

Table 5. Composition and Weight of End-of-Pipe Waste

Composition	Weight	Percent (%)
Biodegradable	50,372	51.0
Recyclable	24,510	25.0
Residual	23,702	23.7
Special Waste	781	0.8
TOTAL	99,365	100.0

Source: Table 3.e Weight, Volume and Composition of End-of –Pipe Waste, pp. 24, 10-Yr. ISWM Plan, 2004

Key Context Factors that have a Bearing on the Practice

Current Solid Waste Management Practices in the City

The barangays have strategically placed waste receptacles within their areas where residents can dispose their garbage. These are then picked up by dump trucks on a designated schedule and transported to the Dampas dumpsite.

There are huge garbage bins/garbage station at the central market, Cogon, Manga, Agora and the fish terminal. Cleaners or sweepers are assigned in each public market in the city.

Likewise, the vendors are encouraged to clean their surroundings and they are strictly required to segregate their wastes. Siltation ponds are provided where mixed solid and liquid wastes are disposed. The solid wastes are collected and transported to the dumpsite.

Most schools in the city have incorporated composting in their subject such as the arts and trade. Some has even practiced recycling waste materials to produce bags, baskets, fans and other handicrafts. Other universities and institutions even have their own garbage collection and disposal systems or they employ the city's garbage collection and disposal system.

Hospital wastes such as fluids and blood products are disposed in septic vaults of health care institutions. The Gov. Celestino Gallares Memorial Hospital has its own incinerator. However, used syringes and other special wastes are transported to the city's dumpsite.

A garbage collection fee of about P400-9,000 annually is paid by businesses and commercial establishment in order to renew their licenses/permits. Big corporations like Coca-Cola Philippines, Inc. maintain their own waste water treatment facilities.

The city has employed about a hundred street sweepers/cleaners in order to maintain the port, streets, parks and other public open spaces. There are waste bins and receptacles located around the city. The seaport, for example, is being maintained by the Philippine Ports Authority (PPA) and wastes from vessels are collected and disposed by the city's garbage collection service.

Despite these *"good"* practices however, the prevalence of the city's solid waste problem reflects the need for urgent attention. For instance, the waste *segregation at source* which was endorsed through local legislation is not yet fully implemented by most of the households and other city residents. Such practice would benefit the bio-composting facility in Dampas so that farmers in the province or neighboring areas have access to inexpensive organic fertilizers. Also, there are still litters on the streets that may be attributed to unsecured waste receptacles/bins or scavengers (both man and stray animals). This reflects an *inefficient system of waste collection*.

Solid Waste Management Services and Resources

The collected solid waste of the city is disposed to the open dumpsite at Barangay Dampas. The dumpsite is about three (3) kms. from the city proper and situated along the boundary of Baclayon town. It is privately-owned with an area of 26,300 sq.m. and a depth of 8 m. (10-Yr. ISWM Plan, 2004). A proposed controlled waste disposal site is located adjacent to the existing open dumpsite.

The Tagbilaran City Waste Management Division has established a garbage collection scheme for all barangays. Segregation is not yet implemented because of the absence of waste diversion facilities and the operation of the controlled dumpsite. The city also has open dump trucks and compactor trucks that collect garbage all around the city. A transfer station is located in barangay Dao; however, it is only used during the scheduled collection of the trucks. Waste receptacles are distributed at strategic location for the general public's utilization.

The city government does not maintain an environment management office as required under Republic Act 9003 (10-Yr. ISWM Plan, 2004). Although an Environmental Protection and Management (EPM) Office was previously created, it is currently not operational. The Waste Management Division is currently responsible for the city's solid waste management.

The City Council has passed the Code of Administrative Ordinance which included ordinances related to solid waste management like the City Environment Code and the Revenue Code which includes specific SWM provisions.

Tagbilaran City's ISWM Strategy at a Glance

Reduction at Source

The city government imposed the segregation of waste into three (3) types: biodegradable, recyclable and residual/special wastes. Information and education campaign will be widely implemented to educate the city residents on the importance of waste segregation. Incentives and penalties/fines shall be imposed to implementers and violators, respectively.

Collection and Transport

A segregated waste collection system is implemented where each type of waste, i.e., biodegradable, recyclable, etc., is collected at a specific schedule (day and time of pick-up). The barangays are responsible for the waste collection. Waste from large establishments, public markets, as well as biodegradable and residual/special waste of households and small establishments is collected by the city's collection services. On the other hand, the barangays are responsible in the collection of recyclable wastes of all domestic and micro-establishments within their jurisdiction.

All biodegradable wastes collected are transported to the city's composting facility in Dampas district. As part of the government's plan is the imposition of garbage collection fees by the year 2006.

Material Recovery and Transfer Station

The city government plans to establish in one facility a composting and recycling center and a transfer station. The composting and recycling center will be farmed out to the private sector. At present, the Bio-Composting and Organic Fertilizer Production Facility located at the Dampas district is being operated by the Bohol Initiators for Sustainable Agriculture and Development, Inc. (BISAD). Biodegradable solid wastes are processed to become organic fertilizers that can be used by farmers of not only Bohol but neighboring provinces as well. This facility aims to address the solid waste problem of the city through the conversion of biodegradable wastes into fertilizers at the same time generate income and employment.

Disposal Management

The city plans to enter into a joint venture on the establishment of the Cluster Sanitary Landfill (SLF) at Alburquerque. This is hoped to be implemented by 2006. Until the SLF is constructed, the city will continue to use the Dampas dumpsite as its primary disposal site for its garbage.

II. PROCESS

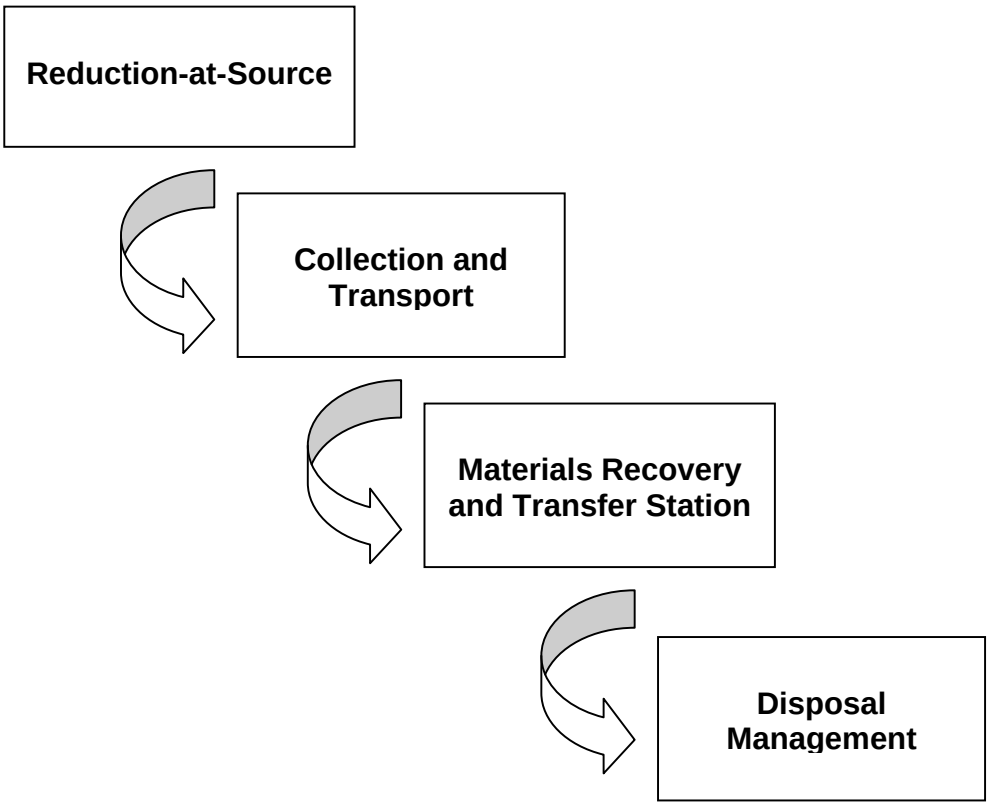


Figure 2.1 General ISWM Strategy of Tagbilaran City
Source: 10-Yr. IWSM Plan, 2004

The ISWM process commenced with the design of all possible options available and applicable for various stages of the integrated solid waste management of the city. It included the learning from the ISWM modules, concepts and theories; waste characterization activity; first-rate practices observed during the cross visit/study tour that were conducted. More importantly, it incorporated the principles of transparency, accountability and participation (10-Yr. ISWM Plan, 2004).

Stage 1: Reduction-at-Source

The city government will impose the segregation of wastes by the city populace/residents. There are three (3) types of wastes as identified: biodegradable, recyclable and residual/special

wastes. A mandatory composting of biodegradable wastes will be implemented by the year 2007. An information and education campaign will be conducted to make the residents aware and well-informed of the policies, regulations, the benefits of segregation and composting.

Stage 2: Collection and Transport

Under a segregated waste collection system the collection of each type of waste is scheduled separately with specific days and time of collection. The barangays are responsible for the collection of domestic and micro establishments' recyclable wastes. Wastes from huge establishments, public markets, and biodegradable and residual/special wastes of household and small establishments are collected by the city collection service.

By year 2006, the city government will only be collecting all wastes generated by large establishments and all public markets. On the other hand, all domestic and small establishments' wastes will be collected by the barangays. A collection fee shall be paid by the city residents. All biodegradable wastes collected are transported to the city's composting center while recyclables will be transferred to the (Materials Recovery Facility (MRF) and residual/special wastes will be transported to the transfer station.

In 2007, residents and small establishments will be required to establish their respective compost pits/pile for their biodegradable wastes. If they, however, wish to continue to avail of the barangays collection service for their mixed wastes, they will be required to pay an additional charge.

Stage 3: Material Recovery and Transfer Station

A composting, recycling center and transfer station will be established in one facility. This will be farmed out to the private sector. All compostable wastes will be processed at the City Composting Center while the City Recycling Center will produced innovative items from recyclable materials. The Transfer Station will receive residual/special wastes then transport it to the Metro Tagbilaran Cluster Sanitary Landfill (SLF). All barangays, however, will be required to maintain their own barangay material recovery facility (BMRF) which will recycle recovered reusable wastes from households and small establishments.

Stage 4: Disposal Management

A joint venture agreement will be entered into by the city government and the Metro Tagbilaran Cluster member municipalities for the establishment of the Alburquerque Cluster sanitary Landfill (SLF). This is expected to be operational by the year 2006. In the meantime, the current open dumpsite will be closed and a controlled dumpsite nearby will be used instead. This controlled dumpsite will be temporarily used only until the SLF is completed and operational.

The entire ISWM planning process involved the following (10 Year ISWM Plan, 2004):

- Legitimization of LGU through partnership with the EcoGov project

- Formation/reconstitution and orientation of the SWM Board
- Solid waste management assessment of the city: establishment and maintenance of a solid waste database system
- Cross visit to some of the SWM showcase sites, e.g., Subic Bay Metropolitan Authority (SBMA), Clark Field and San Fernando City in Pampanga; Marikina City; and Carmona, Barangay Silang and Cavite Institute in Cavite City.
- Solid waste management options/strategies analysis: studied the capability of the city ion terms of budget, ordinances, infrastructure support and the existing manpower for the implementation of the program/practice.
- ISWM plan preparation

Who initiated the practice? Why?

The city government through its Ecological Solid Waste Management (ESWM) Board, which is multi-sectoral in composition, and the Technical Working Group (TWG) initiated the practice in accordance with the 10-Yr. ISWM Plan and as a required by Republic Act 9003. Technical assistance was sought and provided by the Department of Environment and Natural Resources (DENR) through its Philippine Environmental Governance (Eco Gov) Program (10-Yr. ISWM Plan, 2004).

Did the process draw on good practice elsewhere? If so, how was it adapted?

Cross visit to some of the SWM showcase sites, e.g., Subic Bay Metropolitan Authority (SBMA), Clark Field and San Fernando City in Pampanga; Marikina City; and Carmona, Barangay Silang and Cavite Institute in Cavite City. The visit provided helpful inputs to the city's own SWM assessment and planning. It enabled the city's ESWM Board to identify practices that may be replicated in Tagbilaran city with some modifications to fit the current situation.

Among the SWM model practices observed during the cross visit were (10-Yr. ISWM Plan, 2004):

- Education and information campaign
- Segregation-at-source
- Material recovery facility
- Vermi composting
- Monitoring of barangay cleanliness/clean and green program
- Establishment of controlled dumpsite
- Preparation for the establishment of a sanitary landfill
- Establishment and approval of priority projects to support the increase in SWM budget allocation

What are the organizational/institutional structures and arrangements?

The Department of Environment and Natural Resources (DENR) through its Eco-Governance Program, the Provincial Government of Bohol specifically the Bohol Environment Management Office (BEMO), Chief executives of Bohol's 48 component municipalities and city underwent a series of training, assessment and planning. The entire process observed the principles of good governance such as accountability, transparency and participatory decision-making. The partnership with the Eco-Gov and other municipalities in the province has likewise paved for the legitimization of the ISWM planning of the city.

What capacity (staff, people, structures) existed before and after the practice?

As an initial activity, the city government undertook the formation/reconstitution of the Solid Waste Management Board. Although the city has an active board prior to the implementation of the practice, its composition and roles were re-evaluated in order to comply with the requirements of RA9003. During this stage, multi-sectoral stakeholders were invited to participate in the orientation, selection of the new members of the board, as well as in the consensus-building process for the vision, mission and goal setting of the city's ISWM program.

Below is the current (existing) organizational structure of the city's SWM units/offices:

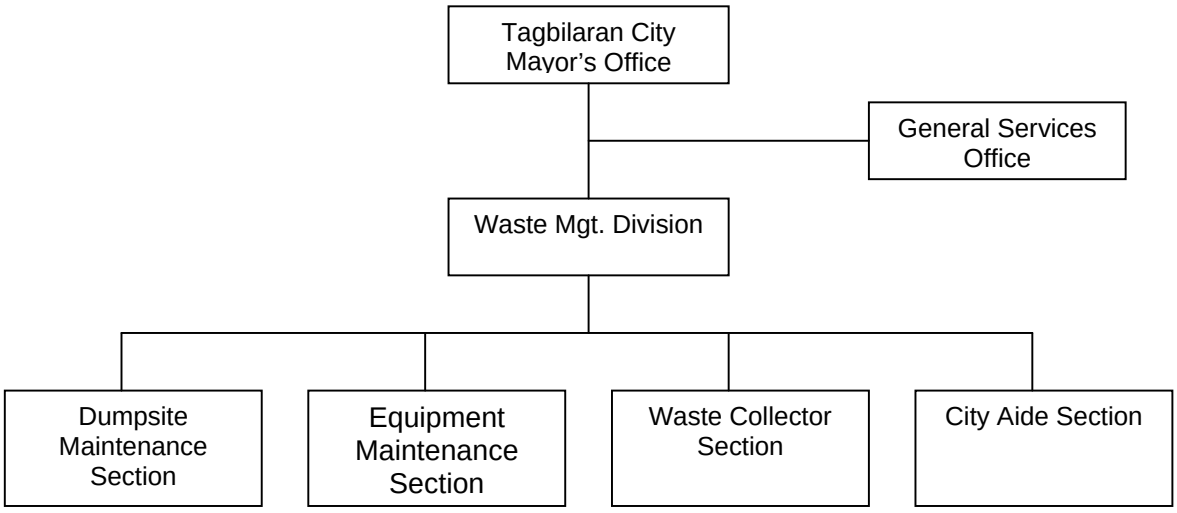


Figure 2. Existing SWM Organizational Structure of Tagbilaran City
Source: 10-Yr. ISWM Plan, 2004

The ISWM Plan included changes in the current structure of the city's ISWM department. This is shown on Figure 2.2.

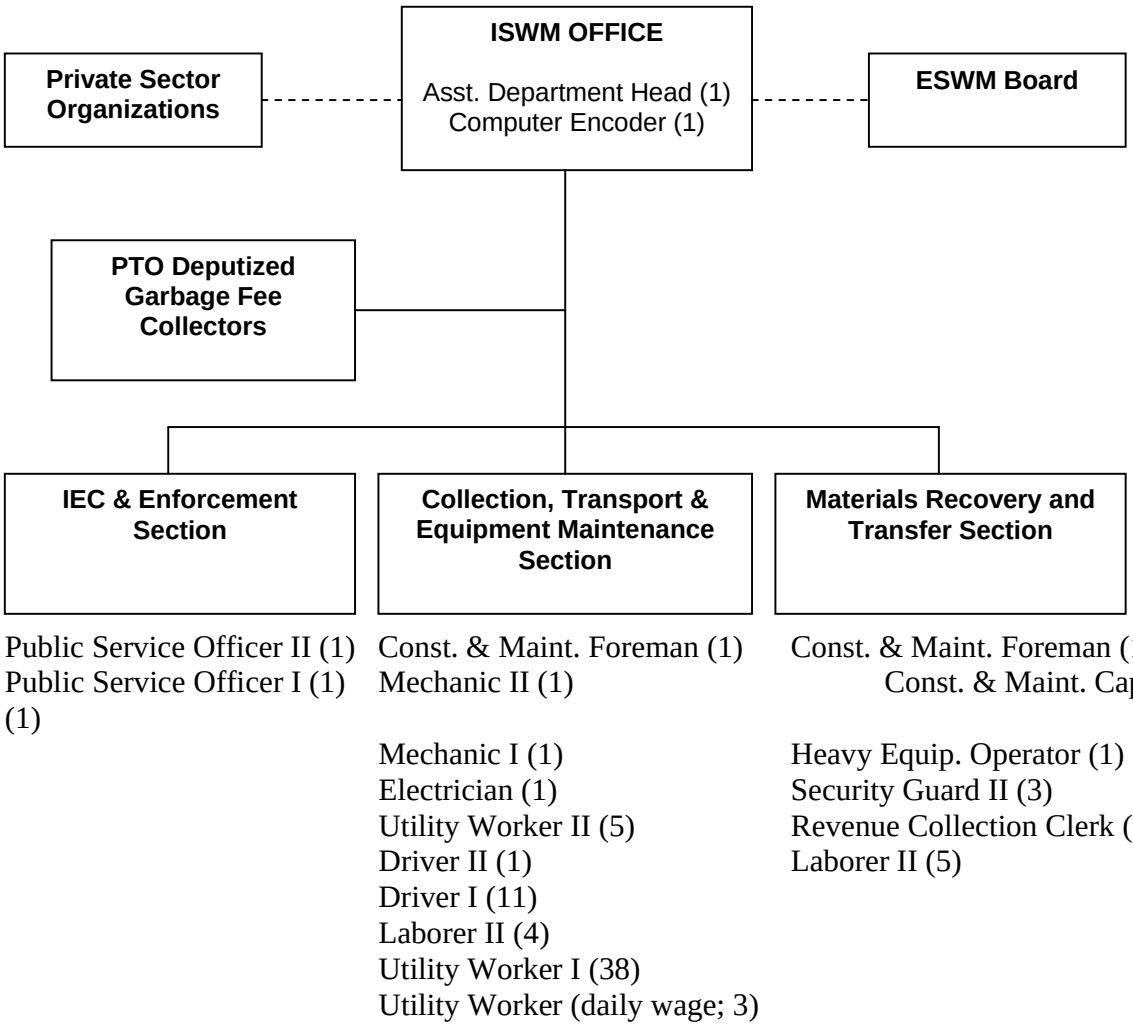


Figure 3. Proposed ISWM Organizational Structure of Tagbilaran City
(Source: 10-Yr. ISWM Plan, 2004)

Unlike the existing structure (Fig. 2.1) where most of the personnel are casual or daily wage employees, the positions under the proposed ISWM structure are on a permanent basis except for the three (3) daily wage utility workers. This means security of tenure and coverage of any government benefits. As such, this would be a very good incentive to the ISWM personnel so they are encouraged to work harder and more conscientiously.

What parts or steps in the process were crucial for success?

Although all steps in the process are vital to the success of the SWM program of the city, encouraging the full support and participation of all the stakeholders as well as the city officials

may be considered as the step that is of utmost relevance. A well planned SWM program will not materialize without the support and participation of the people or stakeholders who are going to benefit from it. Likewise, city officials, who have the power and authority to legitimize the entire program and allocate funds for its implementation, should fully support the SWM program. It is when the community is involved that may contribute to the success of any project and/or program. They should be involved early on in the process so that they will have a sense of ownership to goals of the SWM program.

III. STAKEHOLDERS/ACTORS

There were various stakeholders involved in the ISWM of Tagbilaran city. The preparation of the ISWM Plan involved the following: the Department of Environment and Natural Resources (DENR), specifically its Eco-Governance Program, the Bohol Environment Management Office (BEMO) of the Provincial Government of Bohol, the Chief Executives of Bohol's 48 component municipalities and city.

A technical working group (TWG) was created to undertake the study. The TWG worked with various stakeholders in order to come up with a ISWM Plan for the city. The Ecological Solid Waste Management (ESWM) Board as well as the TWG spearheaded the process and have the following roles/responsibilities based on the 10-Yr. ISWM Plan, 2004:

- Formulates, review and implement the SWM programs of the city
- SWM assessment was conducted to appraise various SWM activities within the city. At this stage, baseline data of both social and physical characteristics of the current solid waste management schemes were generated.
- Educational tour at various showcasing sites of more-advanced and best of the moment SWM technologies and practices.
- The tour enabled the ESWM board and TWG to analyze and compare their SWM practices from other towns successful in implementing SWM programs/projects.
- Options and cost revenue analysis was conducted
  City government Finance was analyzed

In addition, the implementation of the Bio-composting and organic fertilizer production facility in Dampas district involved the following stakeholders with their respective roles/responsibilities (Bio-composting Project Proposal, undated):

- City Government - approval of the bio-composting project and its implementation.

  Institutionalization of the NGO-LGU coordinated efforts to establish a comprehensive waste management through the Local Environmental Planning and Management Office (EPMO).

  Initiates multi-sectoral approach towards addressing the waste and disposal problems.

- Local EPMO - sits in the Project Management Team with the Bohol Initiators for Sustainable Agriculture and Development, Inc. (BISAD) to oversee the project implementation.

  Implements a system of segregation and collection of solid waste through the Solid Waste Management Division.

  Fund-accessing/sourcing and procurement of facilities & equipment.

  Coordinates with the Market Administrator for systems installation.

  Coordinates with the BISAD for biodegradable waste processing.

  Facilitates the construction of the segregation center and multi-purpose processing center.

- BISAD - Implements system for processing of biodegradable waste.

  Appropriate funds for the processing of biodegradable waste into organic fertilizer.

  Responsible for the actual production, marketing and promotion of finished products (organic fertilizers).

  Coordinates with the Local EPMO to ensure proper processing flow.

  Sets up mechanism for marketing and distribution to farmers and farmer organization.

- Market - Administrator Ensures that the system of segregation and collection is properly implemented.

  Supervises the segregation and collection in pilot areas.

  Coordinates with Local EPMO the installation of segregation and collection system.

  Devise measures to improve the system in consultation with market vendors.

- Market Vendors - Actual segregation of biodegradable waste.

  Implements rules and guidelines for segregation, disposal and collection of solid waste in the market.

Maintains a systematic and comprehensive waste disposal in the area.

- Haulers/ Truck Drivers - Ensures collection of segregated solid waste for bio-composting.

  Implements a systematic collection and hauling of biodegradable waste.

- Processing/ Marketing Personnel - Ensures quality production of organic fertilizer.

  Implements systematic processing systems and responsible for proper inventory of finished product.

- Farmers (BISAD Affiliated) - patronizes the organic fertilizers produced by the city.

  Advocates and promotes the use of organic fertilizers as well as organic farming practices.

  Establishes ordering, purchasing, payment collection mechanism with BISAD.

IV. METHODS AND TOOLS

Qualitative analysis was employed to identify the advantages and disadvantages of all possible options for each stage in the process, i.e., reduction-at-source, collection and transport, material recovery and transfer station and disposal management. Among the criteria used for evaluation are suitability and applicability of the project/program, social acceptability, environmental and health impacts/concerns, feasibility and political determination and support. A number of SWM adoptable practices were modified according to the needs and situation in the communities.

An assessment of the current solid waste management practices was conducted. This resulted to baseline information of the social and physical characteristics of the current SWM practices of the city. A 7-day characterization activity was also conducted and this revealed that 92.4 tons of wastes were generated by the city populace. Out of this volume, 60% are biodegradable and about 15% were recyclable wastes. Options and cost revenue analysis was also conducted to evaluate the various strategy options available for the city.

V. IMPACTS AND RESULTS

The SWM strategy of Tagbilaran city is still in its initial implementation stage. However, immediate results can already be observed. First is the direct participation of the local residents in the actual enforcement of the project. Just recently the scheme of waste segregation at source by the residents was modified to include the elimination of waste pile-ups on roadsides as another responsibility of the people. Moreover, barangay leaders were designated as waste managers to ensure the efficient collection of garbage. In this way, the people not only learn about trash management but also "a sense of responsibility and right attitude." Second, the admirable response from the people regarding this new scheme is an indication that the local government has won the support and trust of its constituents. Also, with the strict implementation of the SWM scheme the volume of waste generated by the city that is transported to the controlled dumpsite and eventually to the proposed landfill is reduced. The practice also maximizes segregation efforts through the construction of the material recovery, waste segregation and bio-composting complex.

The strategy likewise enhanced institutional partnerships among the local government, the private sector and NGOs in the locality. Soliciting their support and full participation from the initial phases, as each sector has a role to play in the strategy, ensured the success of the project.

Further, the practice hopes to generate investment for the bio-composting and organic fertilizer production facility. This will also benefit the farmers not only within the province of Bohol but those of neighboring areas as well.

VI. LESSONS LEARNED AND REPLICABILITY

The experience of Tagbilaran city in their quest for a better and more effective and efficient Solid Waste Management (SWM) practice have taught a number of lessons not only for the city officials but also among SWM practitioners and city residents as well. The issue of solid waste management is one of the pressing concerns in most cities and urbanizing areas.

The establishment of the local Environmental Planning and Management unit is an indication that the city government is serious in addressing concerns on solid wastes. However, the local EPM unit is currently not operational. It is hoped that the city government will revive the unit and extend the necessary support so that it can accomplish the tasks for an Integrated Solid Waste Management program for the city.

Another key feature of the ISWM practice is the involvement/participation of various stakeholders. A concept drawn from the UN HABITAT's Sustainable Cities Program, stakeholder participation is believed to greatly contribute to the acceptance of SWM programs/projects and eventually spell out its success.

Another replicable aspect of the practice is the city's partnership with government agencies and the private sector. This is very important especially in soliciting the support of the private sector. As the government is financially strapped, the participation of the private sector would somehow ease the financial burden from the government while both sectors work together to find solutions to the solid waste problems of Tagbilaran City.

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