# EXECUTIVE SUMMARY

*The Local Government Unit of Mina, although a 5th class, have shown that all areas of concern were given due attention and consideration maximizing its resources to improve delivery of basic services. Various infrastructure support facilities were efficiently provided which enabled the LGU to effect and avail of an exemplary performance in terms of Local Governance.*

*Among those infrastructures are rehabilitation / repair / improvement of farm-to-market roads (FMR) in support of LGU's economy and social well-beings; improvement of sports facilities to promote sports activities and sustain peace and order; construction / extension / improvement of potable water supplies in poblacion and in barangays to control incidence of water-borne diseases; improvement of school facilities to increase literacy; health facilities for better and improved health services and all other environmental related facilities and concerns.*

*Environmental problems and concerns are among the top priorities of this administration that require necessary solution in terms of program implementation.*

*As population grows, volume of solid wastes generated also increase. Along with this are wastes generation from different sources other than households, restaurants, carinderias, public market and various business establishments. Examples of these are plastic wrappers from candies and instant foods. Mismanagement of solid wastes create adverse effects on social and economic well-being of the populace.*

*Garbage problem is a global concern that poses threat and danger to the environmental condition which has to be addressed.* ***The Ecological Solid Waste Management Act of 2000*** *primarily plays vital reference in addressing environmental issues. This provide LGUs the prescribed procedures and guidelines in the implementation of the national policy, re: adopting a systematic and comprehensive ecological solid waste management program in the pursuit of sustainable development. The law requires LGUs to formulate their respective Ecological Solid Waste Management Plan through a participative planning approach as very essential requirement.*

*The Municipal Solid Waste Management Board (MSWMB) to this effect was created consistent with RA 9003 tasked to efficiently and effectively implement the environmental programs of the government.*

*With such mandate the LGU has to come up with a plan to address and manage its own solid waste problem. The present administration*

*considered the ESWMP a primary concern not just as a requirement but as a tool and guide in addressing solid wastes issues and concerns.*

*The plan was prepared consistent with the outline provided by the National Solid Waste Commission (NSWMC). It went through the process of waste characterization collected from different sources purposely to establish a correct and accurate baseline data as the basis for an effective and reliable plan output.*

*Solid wastes characterization was conducted through the efforts of the Technical Working Group (TWG) and Solid Waste Sorters created for the specific purpose.*

*(SGD.) HON. REY P. GRABATO*
*Municipal Mayor*

## 1.0 INTRODUCTION

Mina, a fifth class income municipality, had been experiencing problems on solid wastes disposal. The present situation shows that the controlled dumpsite in Barangay Amiroy, about 2 kilometers away from the town proper, is rapidly getting full and congested due to large volume of garbage from different sources. The absence of alternative measures to reduce volume of solid wastes generated was among the reasons identified by the Local Government Unit. Despite the presence of rules and regulations on proper solid waste management and disposal, yet the proper way of segregation was not effected.

The problem on solid wastes became a threatening issue in this municipality wherein the Local Government has to resolve. The issuance of Republic Act 9003, providing guidelines to LGUs in the formulation of 10-Year Solid Waste Management Plan for an effective ecological solid waste management program, creating the necessary institutional mechanisms and incentives, declaring certain acts prohibited and providing penalties, appropriating funds therefore, and for other purposes, has guided the LGU in this endeavor.

A Municipal Solid Waste Management Board (MSWMB) the LGU of Mina was created under this administration and has formulated the 10-year Ecological Solid Waste Management Plan consistent with the mandate of RA 9003. The Board was tasked to formulate plans and policies for implementation and conducted massive information and education campaign (IEC) for the awareness of the stakeholders. Regular meetings and conferences were called upon to establish and maintain proper coordination and cooperation among the members of the Board.

An ordinance shall be passed in support to the implementation of the plan. It is assured that this plan which will be put into action will respond to the reduction of garbage and promote an ecologically balanced and healthy community.

## 1.1 Purpose

### 1.1.a Municipality's vision related to solid waste management

It is envisioned that the formulation of the 10-Year Ecological Solid Waste Management Plan will lead to the reduction and proper management of garbage disposal, and will effectively promote an ecologically balanced community.

### 1.1.b Key issues facing the community

Generation of solid wastes varies directly with the rapid increase of population which create high degree of pollution resulting to a negative effect on the social and economic well-being of the populace. Problems in solid waste seems not a priority of residents due to lack of awareness and information what negative effects may bring to them. People discipline for themselves in as far as garbage management is concerned.

### 1.1.c Goals for the plan, and how the plan will help to alleviate the issues facing the community.

1. Creation of committed and effective Solid Waste Management Board Members to formulate plans and policies on proper garbage management for strict compliance;
2. Formulate comprehensive and effective waste management program to be implemented;
3. Institutionalize the environmental consciousness of the people through intensive education campaign (IEC);
4. Integrate imposition of penalties for violators to establish self discipline among the residents;
5. Motivate and encourage people to engage in backyard composting activity using biodegradable wastes to produce soil conditioner/enhancer fertilizers; and
6. Establish an eco-park and model demo farm for crops and vegetables production to be replicated by the residents.

### 1.1.d Intent of RA 9003 and its effect on Solid Waste Management.

RA 9003, otherwise known as the Ecological Solid Waste Management Act of 2000 mandates all LGUs to formulate their respective 10-year comprehensive Solid Waste Management Plan. This will enable LGU to well-manage their own solid wastes generated thereby reducing waste residues being dumped to the dumpsite.

## 1.2 Approach

The formulation of the municipality's 10-year solid waste management plan has undergone different stages as follows:

- Orientation conference with the members of the Municipal Solid Waste Management Board (MSWMB) concerning the proposed formulation of the 10-year solid waste management plan. Waste characterization Schedule (WACS) introduced by the National Solid Waste Management Commission (NSWMC) as an effective way of determining accurate data in terms of solid waste generation by volume was presented;

- Creation of Technical Working Group (TWG) and waste sorters to conduct waste characterization schedule (WACS);

- The key features of the recommended WACS;

- It has an implementation period of almost five days. The shift from seven days to a shorter period is supported by a statistical analysis which showed no significant differences between the seven-day and five-day WACS processing.

- It looks at both ends of the waste stream – waste generation at source and waste at the "end of the pipe". The study intends to provide an estimate of the waste that "leaks out" of the stream or the "unaccounted waste". This refers to generated wastes that are uncollected and therefore disposed in backyards, open spaces, rivers and creeks.

- Come up with basic data resulted from WACS as reference for solid wastes projection and planning within the ten-year period using the projected population of the municipality 2010-2024.

## 1.3 Acknowledgements:

The municipality of Mina would like to express its profound gratitude and thanks to the concerned person/s, NGAs and other stakeholders in making this plan a realistic one, to wit:

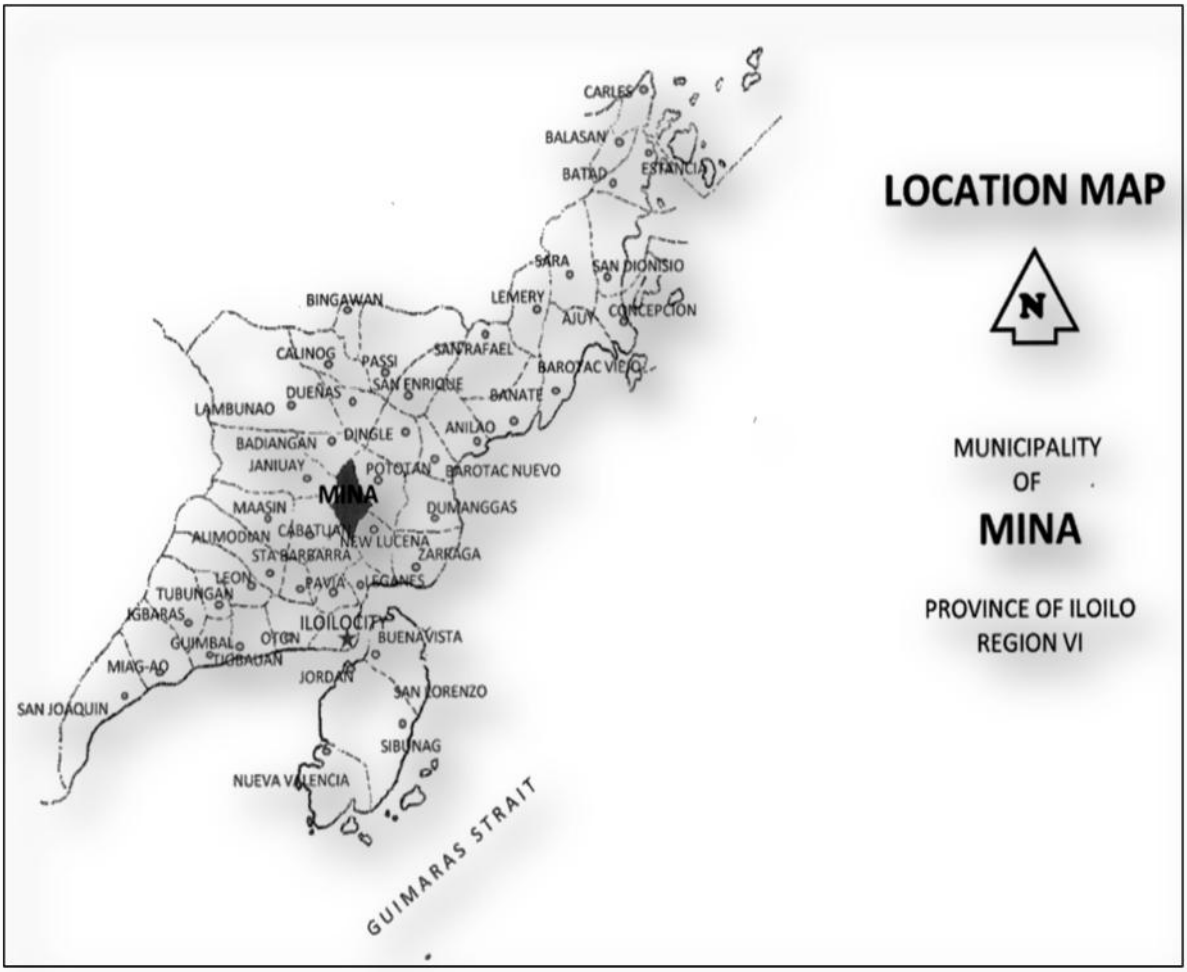
- To the National Solid Waste Management Commission (NSWMC) for the provision of planning outline;
- To the Department of Environment and Natural Resources-Environmental Management Bureau (DENR-EMB) for the technical support to the Municipal Solid Waste Management Board (MSWMB) and Technical Working Group (TWG) and Solid Waste Sorters;
- To the Provincial Environment and Natural Resources Office (PENRO) for their unending support and assistance; and
- To the TWG, Solid Waste Sorters and Stakeholders who in one way or another gave their sincere contribution in the realization of the 10-year Ecological Solid Waste Management Plan.

## *2.0 MUNICIPALITY'S PROFILE*

### *2.1 Location:*

Mina is 38 kilometers away North of Iloilo City, if one travels by road passing through the Municipality of Pototan. It can also be reached by passing through a short cut way across Barangay Agmanaphao and Badiangan. Situated between the two (2) big and progressive Municipalities of Pototan and Janiuay. Mina is just an hour travel or more from Iloilo City by public utility jeepney.

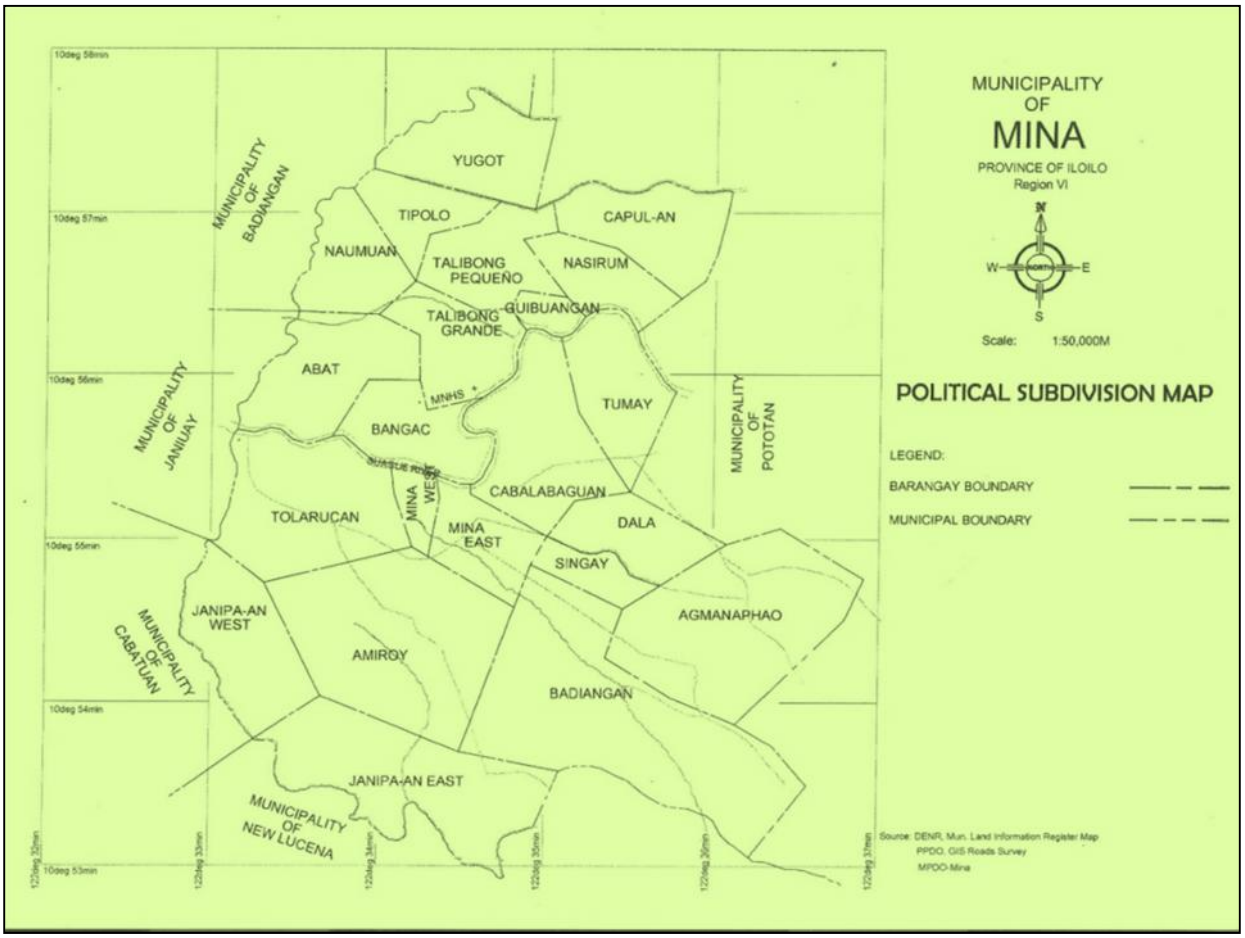
Mina can be located approximately at 122° 35' longitude and 11° 5' latitude. It is bounded by five (5) municipalities – Pototan on the East, Janiuay on the West, Badiangan on the North, New Lucena on the South and Cabatuan on the Southwest. It is practically located in the central part of the Province of Iloilo.



The total land area of the municipality as per plan is 4,340 hectares. Previously, the area used in 1994-2004 CLUP preparation was 3,549.12 hectares which was unofficially derived from the consolidation of sub lots available in the Municipal Assessor's Office.

Consequently, there was a change on the area of Mina by virtue of the submission of the Department of Environment and Natural Resources – Lands Management Bureau (DENR-LMB) of the certified master list of land area to the Department of Budget and Management dated March 3, 2005 which certifies that Mina has a total land area of 4,340 hectares.

The Municipality of Mina comprises of 22 barangays two (2) of which are located in the Poblacion the Mina East and Mina West.



***2.2 History:***

Before 1870, what is today known as the Municipality of Mina was then Barrio ***Montogawe.*** The barrio got its name from a hill that had the appearance of the face of a man. This is prominently located at the middle of the Suague River that ran to the barrio site. Old folks claim that the hill was enchanted because no matter how high the level of water rose during floods, it was never submerged. They declared that the hill seemed to float. It was also reported that on moonlight nights, a lovely lady with a golden goat could be seen roaming the hill. Thus, the settlement around the hill was called *Montogawe* from the Spanish word *"monte"* meaning mountain and *"gawi"* a vernacular word meaning face of a man. The barrio was founded when Captain Antonio Poblacion, better known as Captain Roa, banded together a group of families and sold to them the idea of settling down in a chosen site and for the lack of any name, called it ***Montogawe*** after the hill found at the middle of the Suague River. The site was owned by Captain Patricio Ubalde, also known as Captain Atic. In order to attract more families to join his small group, Captain Roa offered to give lots to the settlers of the said barrio. Families then, attracted by such an offer, flocked to the site to become the barrio's residents. A Civil Decree issued by General La Torre in 1870 lawfully created the civil town of *Montogawe*. One provision of the decree was that a Parish Priest cannot be assigned unless the residents of the newly-founded town build a church, a municipal building and a school house. One of the founders, Captain Antonio Poblacion, with the help of the local and Spanish Officials and the residents pooled their strength together and built a church. ***Montogawe*** was elevated into a parish in 1872 but no parish priest assigned. The Spanish Government may have forgotten or overlooked the conditions of the 1870 Civil Decree of General La Torre for, on July 30, 1873; it issued another decree declaring ***Montogawe*** as parish.

A dispute on the jurisdiction over Tolarucan (now a barangay in this municipality) lodged by both municipalities of Pototan and Janiuay brought about the change in the name of Barrio ***Montogawe.*** A certain Capitan Placido wanted jurisdiction over Tolarucan but Capitan Roa objected. He alleged that the survey of ***Montogawe*** included Tolarucan. The controversy lasted for years because it was elevated to the court in Manila for final judgment. Captain Roa brought the case to the attention of the Bishop of Jaro, Iloilo and impressed upon him the importance of the case to the church. He pointed out that if he loses the case it was not he who would lose but the church. The Bishop appointed ten (10) priests to handle the case. The priests retained the services of a Spanish lawyer named Mina. Atty. Mina won the case and ***Montogawe*** gained jurisdiction over Tolarucan. It cannot be fully ascertained but some sources say that Atty. Mina refused to accept monetary remuneration. Because of his gallant act, the town was named in his honor, thus ***Montogawe*** became Mina. By virtue of Republic Act No. 5442, Mina became a municipality on September 9, 1968. In 1969 a special local election for Mina was held in which **Hon. Arthur D. Defensor, Sr**. and **Hon. Luis C. Parayray** were the first elected Mayor and Vice Mayor, respectively.

***2.3 Population:***

**Current and projected population for each barangay, indicating rural and urban areas:**

**Table 1**

**A. Current Population for Each Barangay (2010)**

| NAME OF BARANGAY | 2010 |
|---|---|
| URBAN | |
| 1 Mina East | 1362 |
| 2 Mina West | 1388 |
| **Sub - Total** | **2750** |
| RURAL | |
| 1 Abat | 799 |
| 2 Agmanaphao | 1412 |
| 3 Amiroy | 1621 |
| 4 Badiangan | 1764 |
| 5 Bangac | 1295 |
| 6 Cabalabaguan | 1883 |
| 7 Capul-an | 591 |
| 8 Dala | 988 |
| 9 Guibuangan | 277 |
| 10 Janipa-an East | 1207 |
| 11 Janipa-an West | 775 |
| 12 Nasirum | 276 |
| 13 Naumuan | 393 |
| 14 Singay | 624 |
| 15 Tal. Grande | 603 |
| 16 Tal. Pequeño | 475 |
| 17 Tipolo | 625 |
| 18 Tolarucan | 1707 |
| 19 Tumay | 1046 |
| 20 Yugot | 674 |
| **Sub - Total** | **19035** |
| **TOTAL** | **21785** |

Based on NSO Survey conducted 2010

## Table 2
## B. Projected Population per Barangay
## 2010-2024

| Barangay | Current 2010 | Projected Population | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| **Urban** | | | | | | | | | | | |
| **Mina East** | 1362 | 1510 | 1540 | 1569 | 1599 | 1629 | 1658 | 1688 | 1717 | 1747 | 1777 |
| **Mina West** | 1388 | 1539 | 1569 | 1599 | 1629 | 1660 | 1690 | 1720 | 1750 | 1780 | 1810 |
| **Sub-Total** | **2750** | **3049** | **3109** | **3168** | **3228** | **3289** | **3348** | **3408** | **3467** | **3527** | **3587** |
| **Rural** | | | | | | | | | | | |
| **Abat** | 799 | 886 | 903 | 921 | 938 | 955 | 973 | 990 | 1007 | 1025 | 1042 |
| **Agmanaphao** | 1412 | 1566 | 1596 | 1627 | 1658 | 1688 | 1719 | 1750 | 1780 | 1811 | 1842 |
| **Amiroy** | 1621 | 1797 | 1832 | 1868 | 1903 | 1938 | 1973 | 2009 | 2044 | 2079 | 2114 |
| **Badiangan** | 1764 | 1956 | 1994 | 2032 | 2071 | 2109 | 2148 | 2186 | 2224 | 2263 | 2301 |
| **Bangac** | 1295 | 1436 | 1464 | 1492 | 1520 | 1548 | 1577 | 1605 | 1633 | 1661 | 1689 |
| **Cabalabaguan** | 1883 | 2088 | 2129 | 2170 | 2211 | 2251 | 2292 | 2333 | 2374 | 2415 | 2456 |
| **Capul-an** | 591 | 655 | 668 | 681 | 694 | 707 | 720 | 732 | 745 | 758 | 771 |
| **Dala** | 988 | 1095 | 1117 | 1138 | 1160 | 1181 | 1203 | 1224 | 1246 | 1267 | 1289 |
| **Guibuangan** | 277 | 307 | 313 | 319 | 325 | 331 | 337 | 343 | 349 | 355 | 361 |
| **Janipaan East** | 1207 | 1338 | 1364 | 1391 | 1417 | 1443 | 1469 | 1496 | 1522 | 1548 | 1574 |
| **Janipaan West** | 775 | 859 | 876 | 893 | 910 | 927 | 944 | 960 | 977 | 994 | 1011 |
| **Nasirum** | 276 | 306 | 312 | 318 | 324 | 330 | 336 | 342 | 348 | 354 | 360 |
| **Naumuan** | 393 | 436 | 444 | 453 | 461 | 470 | 478 | 487 | 496 | 504 | 513 |
| **Singay** | 624 | 692 | 705 | 719 | 733 | 746 | 760 | 773 | 787 | 800 | 814 |
| **Talibong Grande** | 603 | 669 | 682 | 695 | 708 | 721 | 734 | 747 | 760 | 773 | 787 |
| **Talibong Pequeño** | 475 | 527 | 537 | 547 | 558 | 568 | 578 | 589 | 599 | 609 | 620 |
| **Tipolo** | 625 | 693 | 707 | 720 | 734 | 747 | 761 | 775 | 788 | 802 | 815 |
| **Tolarucan** | 1707 | 1893 | 1930 | 1967 | 2004 | 2041 | 2078 | 2115 | 2152 | 2189 | 2227 |
| **Tumay** | 1046 | 1160 | 1182 | 1205 | 1228 | 1251 | 1273 | 1296 | 1319 | 1342 | 1364 |
| **Yugot** | 674 | 747 | 762 | 777 | 791 | 806 | 821 | 835 | 850 | 865 | 879 |
| **Sub-Total** | **19035** | **21106** | **21517** | **21933** | **22348** | **22758** | **23174** | **23587** | **24000** | **24414** | **24828** |
| **Grand Total** | **21785** | **24155** | **24626** | **25101** | **25576** | **26047** | **26522** | **26995** | **27467** | **27941** | **28415** |

Based on NSO Survey conducted 2010

**Table 3**

**C. Projected Number of Household per Barangay, 2015**

| BARANGAY | NO. OF HOUSEHOLDS |
|---|---|
| Abat | 195 |
| Agmanaphao | 329 |
| Amiroy | 372 |
| Badiangan | 409 |
| Bangac | 281 |
| Cabalabaguan | 462 |
| Capul-an | 137 |
| Dala | 237 |
| Guibuangan | 69 |
| Janipa-an East | 269 |
| Janipa-an West | 174 |
| Mina East | 295 |
| Mina West | 320 |
| Nasirum | 65 |
| Naumuan | 94 |
| Singay | 140 |
| Talibong Grande | 129 |
| Talibong Pequeño | 105 |
| Tipolo | 141 |
| Tolarucan | 405 |
| Tumay | 261 |
| Yugot | 162 |
| **TOTAL** | **5051** |

Based on NSO Survey conducted 2010

### *2.4 Economic Profile/Land Use:*

#### *Industry:*

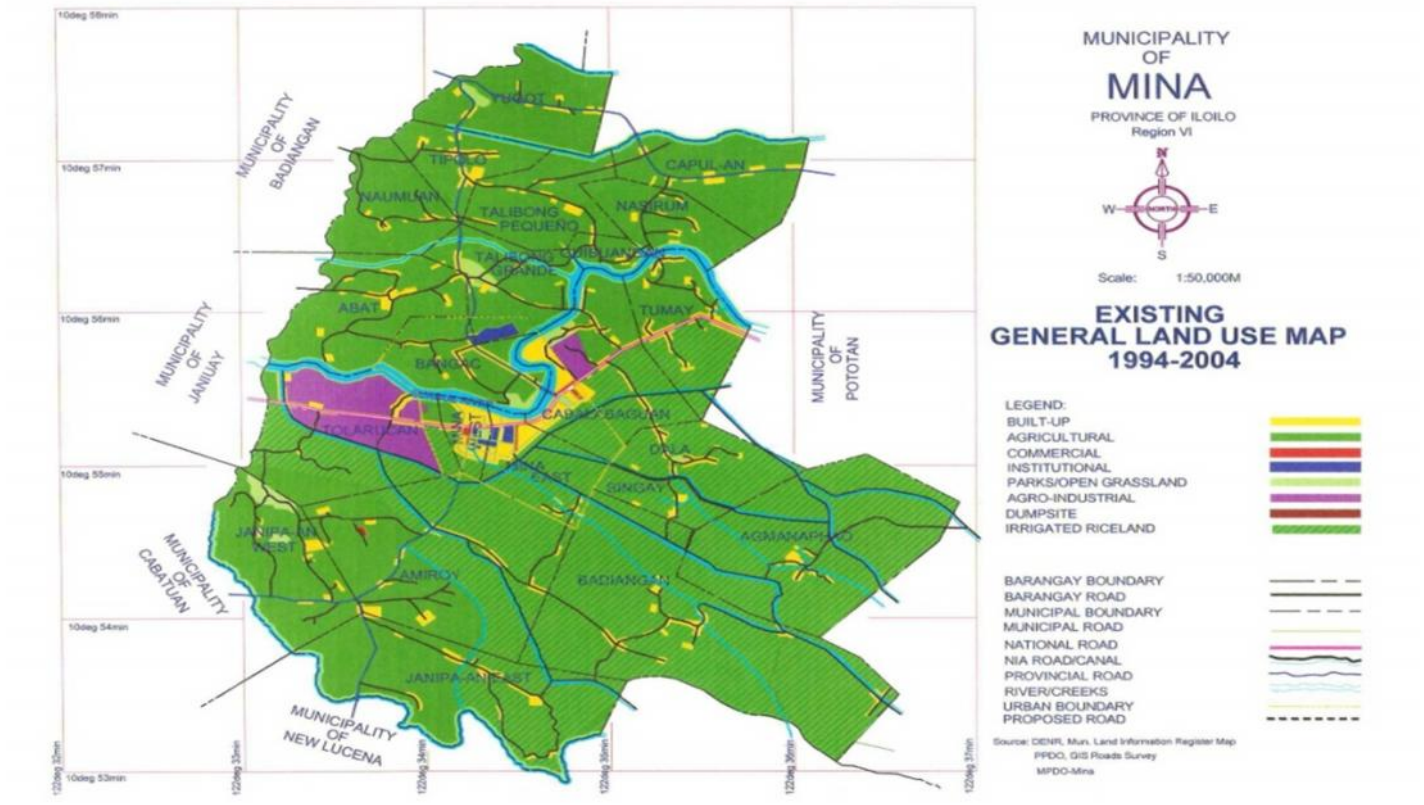
Mina is dominantly an agricultural land with rice as its major crop. There are several establishment operating in this municipality but most of these are agro-based industrialization. Hereunder are the existing agro-industrial establishments by intensity and capitalization.

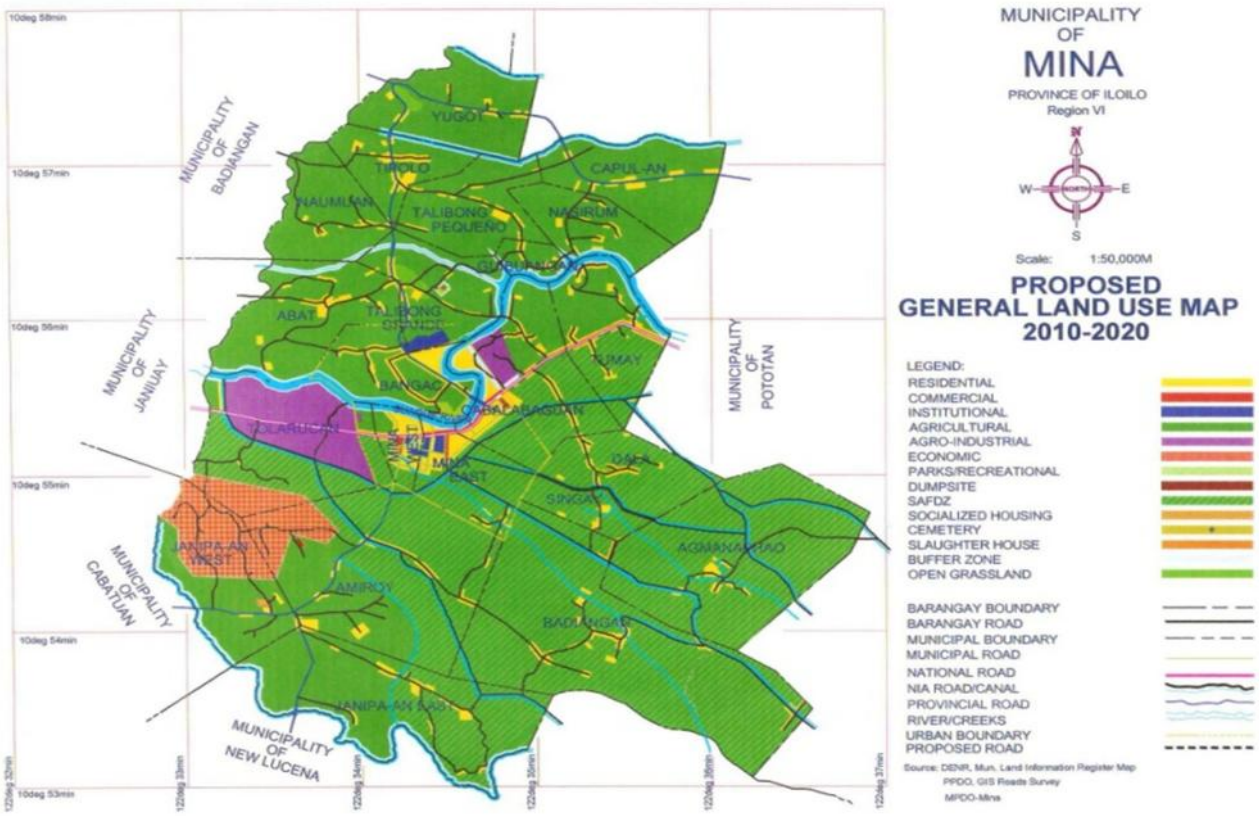
**Table 4**

**Inventory of existing agro-industrial establishments by intensity and capitalization**

| Barangay | Name of Industrial Establishment | Land Area (hectares) | Intensity Classification | Capitalization | Employment |
|---|---|---|---|---|---|
| Talibong Pequeno | MOFAWA | 7 | Non-Pollutive/Non Hazardous | P500,000.00 | 20 |
| Tolarucan | RPG | 2.4196 | Non-Pollutive/Non Hazardous | P10M | 100 |

#### *Land Use Map:*






***Transportation:***

Mina is situated in the central part of the Province of Iloilo. It takes about 1 ½ hours to travel from the municipality to the city in public utility Jeepneys and less than an hour in private vehicles passing the route either through Pototan or Janiuay.

The total road length is 109.184 kms. Of these, 9.851 are classified as national road which is an access in going out to the city and other parts of the municipality, 11.565 provincial roads, 3.185 municipal roads and 80.583 are barangay roads.

There are three existing bridges located in 3 barangays. They are made of concrete with load capacity from 5 to 10 tons, all are serviceable. Other related structures are concrete box culvert and reinforced concrete pipes (RCP) situated in 22 barangays of the municipality.

**Table 5**
**Inventory of Bridges by Location, Type, Capacity and Condition**

| BRIDGE NAME | LOCATION (BARANGAY) | TYPE | ROAD CAPACITY (TONS) | PHYSICAL CONDITION |
|---|---|---|---|---|
| Suague RCGB | Cabalabaguan | RCGB | 10 | Good |
| Amiroy Bridge | Janipa-an East | Bailey | 5 | Good |
| Talibong Grande Bridge | Talibong Grande | Steel Beam | 10 | Good |
| Tipolo Culverts | Tipolo | Box Culvert | 5 | Good |

Source: MEO/MPDO

Traffic congestion usually occurs during market days and in front of Mina Public Cemetery wherein there is an intersection going to Bangac where the Mina National High School is located.

Table shows that land transportation terminals are situated in Barangay Cabalabaguan in the Public Market, both for tricycles and Jeepneys occupying an area of 0.0060 hectare more or less.

**Table 6**
**Land Transportation Terminals by Location and Condition**

| Name | Barangay | Area Occupied (Hectares) | Type of Public Utility Using the Terminal | Terminal Facilities | Physical Condition |
|---|---|---|---|---|---|
| MTODA | Cabalabaguan | 0.0060 | Tricycles | Public Market | Good |
| MJODA | Cabalabaguan | 0.0060 | Jeepneys | Public Market | Good |

Source: MPDO/MEO

Based on the record, the total number of vehicles registered are: public utility jeepneys (PUJ) – 39; tricycles – 108; bicycles – 17; and trisikads – 144. Route destinations of these vehicles are from the Barangay to City/Municipal Center except trisikad whose route is within the municipal vicinity.

### *2.5 Physical Characteristics*

***Topography/Slope:***

The Municipality of Mina is generally plain with the exception of some barangays, like Abat, Naumuan, Tipolo, Yugot, Nasirum, Janipa-an West and Capul-an. Land elevation, however, in said areas are not significantly high. It is estimated at about 10 to 20 feet above sea level. The hilly portion and the rolling parts of the land are abounding with trees and bamboos. Crops grown in these areas are mostly sugar cane, coconut, coffee, banana and fruit trees.

Mina has a total land area of 43.40 sq. kms. of which 31.71 sq. kms., belong to slope grouping category A (from 0-8%), 10.68 sq. kms. belong to category B (8-15%) and 1.01 sq. kms. belong to category C (15-18%).

**Table 7**
**SLOPE CLASSIFICATION**

| Slope Classification | Land Area (sq. kms) | % TOTAL Land Area | Slope Grouping Category |
|---|---|---|---|
| A | 31.71 | 73.06 | 0-8% |
| B | 10.68 | 24.61 | 9-15% |
| C | 1.01 | 2.33 | 16-18% |

Source: MPDO

***Hydrology:***

The drainage pattern of the **Suague River** is from the headwater on the west at the mountainous area of the municipality of Janiuay and drains to the ***Jalaur River*** on the east at the municipality of Pototan, or current flows from West to East.

Drainage infrastructure includes the ***Suague River Irrigation System*** of NIA with its ***Overflowing Dam*** at Brgy. Tolarucan, Mina, Iloilo and its irrigation canal that supplies water to vast agricultural land of this municipality and other municipalities like Pototan and New Lucena estimated at about ***2,453 hectares more or less.***

***Soil:***

There are four types of soil that can be found in the Municipality of Mina. These are Sta. Rita Clay, Alimodian Clay Loam, Umingan Fine Sandy Loam and Alimodian Silt. Of these four types of soil, Sta Rita Clay is the most dominant. It covers approximately 3,130.92 hectares or 72.14% of the total land area. The most suitable crop planted to this type of soil is rice and is common in the barangay Yugot, Tipolo, Talibong Grande, Guibuangan, Tumay,

Cabalabaguan, Tolarucan, Poblacion, Dala, Amiroy, Singay, Badiangan, Janipa-an East, and Agmanaphao. Another type of soil prevalent in this municipality is the Alimodian Clay Loam which occupies an area of 1,002.42 hectares. This is located in the barangays of Naumuan, Abat, Bangac, Nasirum, Capul-an, Janipa-an West and portions of Janipa-an East. Umingan Fine Sandy Loam covers 160.19 hectares or 3.69% of the total land area. This type of soil is most common in areas along river banks. Alimodian Silt comprises of 46.47 hectares or 1.07% of the total land area and can be found at the Southern portion of Janipa-an East.

**Table 8**

**SOIL CLASSIFICATION**

| Types of Soil | Area Covered (Has.) | % to Total |
|---|---|---|
| 1. Sta. Rita Clay | 3,130.90 | 72.14 |
| 2. Alimodian Clay Loam | 1,002.42 | 23.10 |
| 3. Umingan Fine Sandy Loam | 160.19 | 3.69 |
| 4. Alimodian Silt | 46.47 | 1.07 |
| **Total** | **4,340.00** | **100.00** |

***Climate:***

Mina, like all other municipalities in the province, has two pronounced seasons - the wet and dry. Rains usually fall from the months of June to November, while the months of December to may rains seldom fall. Based on the PAG-ASA reports, this municipality is within the typhoon belt. Typhoon usually strike within the 1st and 4th quarters of calendar year.

## 3. *CURRENT SOLID WASTE MANAGEMENT CONDITIONS*

### *3.1 Institutional Arrangements*

**List of Existing Agencies of the Municipal Administration that handle SWM and its services, and the roles and responsibilities of the agencies:**

a .Municipal Engineering Office

- Responsible for the equipments use for the collection of solid waste.

b. General Services Office

- In-charge of IEC to all residents and occupants of buildings in major thoroughfares and disseminate the schedule of collection and other information needed by the public;

- In-charge of the daily collection of both biodegradable and no-biodegradable wastes and supervise the operation of the multi-purpose truck that collects the waste;

- Coordinate with the office of the Municipal Agriculture Office during the transport of waste to the ecological park; and

- Implement programs, projects and activities pertaining to cleanliness and waste management consistent with RA 9003.

c. Municipal Agriculture Office

- Supervise the operation and maintenance of ecological park as well as that of the shredder machine and other facilities within the premises of eco-park; and

- In-charge of the supervision and maintenance of composting operation and plant nursery.

d. Municipal Official Chairman Committee on Environmental Protection, Department Heads of the Offices concerned and the Designated MENRO are given the responsibility to handle the IEC.

e. The junkshop present in the municipality is responsible for the buy and sell of recyclable materials either placed in the MRF or direct from the households, market and other establishments.

f. The Designated MENRO under the Municipal Engineering Office leads the implementation of the Solid Waste Management Programs.

g. The Local PNP / is responsible for the enforcement of regulations on solid waste management ordinances.

**3.1.2 Roles and Responsibilities of the agencies includes all aspects of SWM to wit:**

**Collection –(a)** the town collects garbage on the scheduled data and time during Mondays, Wednesdays, and Fridays (MWF). In the morning of these days, garbage to be collected are residual wastes of the households and establishments. While in the afternoon are residual wastes of the mina town hall (MTH), Market, Mina National High School (MNHS), Mina Central School (MCS), Church, and public places like streets, parks, plaza and playgrounds; and (b) Tuesdays and Thursdays (TTH). Only biodegradable wastes shall be collected in the morning of these days in public places like streets, parks, plaza and playground.

**Collection period:**

Garbage collection shall be done regularly every week on the scheduled date and time, to wit;

- Monday, Wednesday & Friday (MWF)
  A.M. – residual waste of households and establishments (commercial, industrial, institutional, etc.)

  P.M. – residual waste of Mina Town Hall, market and Mina National High School, Mina Central School, Church and public places like streets, parks, playground and plaza.

- Tuesday and Thursday (TTh):

  A.M. – biodegradable wastes on public places (streets, parks, plaza & playground)

Seven (7) barangays shall be covered by the municipalty's garbage collection services program. These are the barangays of Mina East, Mina West and portions of Cabalabaguan, Tumay, Bangac, Tolarucan and Amiroy particularly those houses situated along the road adjacent to the town proper. Households concerned in these mentioned areas are made responsible to take care of disposing their own biodegradable wastes.

Biodegradable and recyclable wastes collected from public market and other major establishments like groceries, schools, health facilities, etc. shall be transported to Montogawe Site for processing. Biodegradable wastes shall be processed into soil conditioners through the composting facility and the recyclable ones shall be segregated and be stored at the materials recovery facility (MRF). Meanwhile residual and special wastes shall be transferred to residual containment area (RCA) and special wastes chamber (SWC), respectively, at the municipal final disposal and recovery facility at Barangay Amiroy.

The remaining fifteen (15) barangays of the municipality shall take responsible in the management of their respective solid wastes consistent with the 10-year solid waste management plan of the municipality.

The MRFs established in the barangays shall be properly maintained, while those barangays without the MRF yet shall be required to establish the same to be placed in a piece of land determined by the barangay. Residual wastes shall be deposited in the barangay RCA and its accumulated volume shall be collected by the municipality.

**Collection of Fees**

The system of payment of fees and charges for the garbage collection services shall be as follows:

- P1,500.00 – shall be charged annually from commercial, industrial, institutional and other related establishments. This may be paid monthly or quarterly on equal staggered bases.
- P500.00 – shall be charged annually from residential buildings. This may be paid monthly or quarterly on staggered basis.

**Recycling:**

There is only one junk shop in the municipality owned by Mr. Gorgonio Pangantihon at Brgy. Cabalabaguan, Mina, Iloilo. These shop cater for the recyclable materials generated by households, market and commercial establishments in the whole municipality.

**Disposal:**

**Disposal –** There are policies established by the municipality to effect proper disposal of garbage in the locality. These are as follows:

*a. No segregation, No Collection Policy*

This requires segregation of garbage at source. Non-complying households shall not be entitled to garbage collection. In this case only residual waste shall be collected. Biodegradable wastes shall be composted by the households concerned in their own backyard. All other wastes are re-used and recycled to reduce volume of solid waste generated.

*b. Basura mo, Ibulsa mo*

All are encouraged to put their *little waste* such as candy wrappers and the likes in their pockets in case of being far from the waste container. The acts like this can help minimize the littering of solid wastes.

*c. Anti-Littering*

Enactment of anti-littering ordinance penalizes those persons caught throwing their garbage everywhere. It is a law that prohibits everyone to litter especially in public places like playgrounds, plaza, public market, etc.

*d. Burning is prohibited*

Burning is strictly prohibited as it emits green house gases that destroy our ozone layer which is the cause of global warming.

*e. Composting*

Aside from composting facility established by the municipal government, all households are enjoined to have their backyard composting activity at home. With this, initiative, they may able to produce soil enhancer for their own consumption without spending so much expenses purchasing in-organic fertilizer they need.

**Information, Education Campaign (IEC) Programs**

Municipal Ordinance No. 2010-157 also known as Comprehensive Solid Waste Management Ordinance encourages everyone to participate in the solid waste management program of the municipality. Information Education Campaign (IEC) is a component of this endeavor, This is being done through Pulong-Pulong conducted in the barangays. To ensure awareness of the residents, this municipality produces leaflets, and posters containing slogans and information pertaining to proper solid waste management and disposal.

All sectors especially the schools are encouraged to participate in the solid waste management through Information and Education Campaign. Also part of this campaign is putting up of slogan with the text “BASURA MO, IBULSA MO” in public places that can be easily seen and “NO SEGREGATION, NO COLLECTION POLICY” in areas where there is an existing collection system.



**3.1.2.e Accounting:**

**Table 9**

RECORDS OF SALES AS OF CY 2013

| DATE | DESCRIPTION | AMOUNT |
|---|---|---|
| 1. January, 2013 | Assorted Junks | 185.00 |
| 2. April, 2013 | Assorted Junks | 160.00 |
| 3. June, 2013 | Assorted Junks | 180.00 |
| 4. August, 2013 | Assorted Junks | 95.00 |
| 5. October, 2013 | Assorted Junks | 120.00 |
| 6. December 2013 | Assorted Junks | 108.00 |
| | **TOTAL P** | **848.00** |
| | **Plus Balance Forwarded** | **120.80** |
| | **TOTAL P** | **968.80** |

(LESS) RECORD OF DISBURSEMENT C.Y. 2013

| | |
|---|---|
| 1. 2 Man-Days – Repair of Garbage Container | P400.00 |
| 2. 2 Man-Days Maintenance of Dumping Site | P400.00 |
| 3. Office Supplies for 2013 Evaluation | P 90.00 |
| Cash On Hand | **P 78.80** |

PREPARED BY:

**LICERIO C. PATINGO**
MGDH (GSO) / ICO-MEO

CHECKED BY:

**MARIA C. TOMO**
OIC-Municipal Accountant

**Implementation:**

- Only residual wastes are collected by the municipal garbage truck for those who applied, paid the corresponding fees and executed the garbage collection contract. No segregation, no collection policy is strictly implemented. The specific date and time of garbage collection in a particular place is scheduled and announced for strict compliance by all concerned.

- "No segregation, No collection" policy is imposed. Garbage not segregated and placed in proper containers required by the local government shall not be collected. Instead, it will be treated as violation of the anti-littering act as provided in the Comprehensive Solid Waste Management Ordinance.

- The specific date and time of garbage collection in a particular place is scheduled and announced for strict compliance by all concerned.

- Biodegradable waste of individual household and establishments are managed by themselves. Individual household pit is encouraged.

**Enforcement of Regulations:**

- Any individual person or persons who violate the Comprehensive Solid Waste Management Ordinance shall upon conviction be punished by a fine as follows;

| | |
|---|---|
| 1st Offense | P1,500.00 or 10 days community work or both at the discretion of the court. |
| 2nd Offense | P2,000.00 or 15 days community work or both at the discretion of the court. |
| 3rd Offense | P2,500.00 or 20 days community work or both at the discretion of the court. |

### *3.2 Inventory of Equipment and staff*

Table 10 indicates the list of existing equipments, their capacity and condition. This equipments are used for the on-going implementation of solid waste management programs and activities.

**Table 10**
**List of Existing Equipments, Capacity and present condition**

| Number | Unit | Description | Capacity | Condition |
|---|---|---|---|---|
| **1** | **Unit** | **Payloader** | **1 cu.m.** | **Operational** |
| **1** | **Unit** | **Road Grader** | | **Operational** |
| **2** | **Units** | **Dump Trucks** | **3 cu.m.** | **Operational** |
| **1** | **Unit** | **Toyota Hilux** | | **Operational** |
| **1** | **Unit** | **Service Jeep** | | **Operational** |
| **1** | **Unit** | **Shredder Machine with Engine** | | **Operational** |
| **1** | **Unit** | **Garbage Compactor** | **5 cu.m.** | **Operational** |

There are four (4) personnel who are directly involved in the solid wastes collection activity headed by the Environmental Management Specialist I – designated MENRO of this municipality. Municipal Solid Waste Management Board (MSWMB) was created, through Executive Order No. 02-014, a special body responsible for plans and policies relative to solid waste management.

**Table 11**

| Number of Personnel | Designation | Department |
|---|---|---|
| **1** | **EMS-I (Designated MENRO &Eng'g. Asst.)** | **Mun. Engineering Office** |
| **1** | **Garbage Compactor Driver** | **Job Hired** |
| **2** | **Garbage Collector** | **GSO & Job Hired** |

Executive Order No. 019, Series of 2012 was issued creating the Technical Working Group (TWG) on Waste Analysis and Characterization Study (WACS) and Solid Wastes Sorters. The TWG and Sorters attended an orientation on the conduct of WACS in preparation to the formulation of 10 Year Solid Waste Management Plan 2015-2024.

***Type of Staff Training available***

***a)*** Orientation conference with the members of the Municipal Solid Waste Management Board (MSWMB) concerning the proposed formulation of the ***10-year solid waste management plan.***

b) ***Waste Analysis and Characterization Study (WACS)*** introduced by the National Solid Waste Management Commission (NSWMC).

***3.3 Source Reduction***

There are several ways being practiced by the municipality to reduce volume of waste at source. No segregation, No collection policy is imposed to all households in the community. Households not complying with this policies shall be deprived from collection program and services regardless whether or not they paid the corresponding fees provided, therefore the same is thru with various establishment existing within the municipality of Mina.

It is also encourage that every household should establish individual composting activity in their backyard. With this initiative, it will not just reduce the volume of waste to be collected but also will help in the economic well-being of every household due to generation and production of soil conditioner. In effect only residual wastes shall be subject for collection while the recyclable ones may either be sold out at home or be brought and stored at the MRF.

***LGU innovation in waste reduction***

Our LGU advocates the use of indigenous materials for costumes, attire and other accessories of our dancers and show participants during our fiestas and street dancing.

During fiesta, we showcase a modern-ethnic show and the municipality has save much for costumes and other accessories of our dancers for we used old newspapers for paper mosaic (Kuron) and Igorot attire. We also use rags as accessories of our street dancers last December Christmas Festival.


Plastic and candy wrapper were cut into small pieces and were made into pillows and doors and window decors and also used as skirting. These were initially introduced by teachers in elementary school to pupils and students.

## *3.4 Collection:*

**Description of the existing system for each service area:**

The Municipality handles the overall collection of wastes from all government offices, business establishments including public market and portion of four (4) barangays adjacent to the town proper mainly: Tolarucan, Cabalabaguan, Bangac and Amiroy. Final segregation and disposal shall be done at the composting facility and MRF at Montogawe Site. Residual wastes shall be disposed at the residual containment area (RCA) for Final Disposal at Brgy. Amiroy.

a. All areas of concern are ensured that the segregated residual wastes are placed in front of the gate or door to be picked-up and loaded to collection vehicle during the collection period.

### *3.4.1 Type of collection (segregated vs. non-segregated):*

a. Garbage not segregated and placed in containers required by the local government shall not be collected and will be treated as violation of the anti-littering ordinance and be penalized accordingly.
b. The collection of hazardous wastes (if necessary) shall be coordinated with the municipal government for appropriate action.

### *3.4.2 Frequency of collection to same area for each type of collection.*

Garbage collection shall be done regularly every week on the scheduled date and time, to wit;

- Monday, Wednesday & Friday (MWF)
  A.M. – residual waste of households, and establishments (commercial, industrial, institutional, etc.)

  P.M. – residual waste of Mina Town Hall, Market and Mina National High School, Mina Central School, Church and public places like streets, parks, playground and plaza.

- Tuesday and Thursday (TTH):

  A.M. – biodegradable wastes on public places (streets, parks, plaza & playground)

*3.4.3 Description of areas not currently receiving collection service.*

Areas not covered by collection service are sixteen (16) rural barangays of the Municipality. Those 16 rural barangays shall take responsible in the management of their respective solid wastes consistent with the 10-year solid waste management plan of the municipality.

The MRFs established in the barangays shall be properly maintained, while those barangays without the MRF yet shall be required to establish the same to be placed in a piece of land determined by the barangay. Residual wastes shall be deposited in the established barangay RCA.

## *3.5 Transfer:*

Presently there is no need yet to transfer solid wastes to other stations as the municipality's garbage collection system is still within its capacity having an average rate of 0.55 tons per day. However, the municipality is using its own two (2) unit dump trucks with a capacity of three (3) cu.m. each and one (1) unit garbage compactor having a capacity of five (5) cu.m. in transporting solid wastes from source to final disposal and recovery facility at brgy. Amiroy or from source to composting facility and MRF at Montogawe Site. Only residual waste shall be delivered to controlled dumpsite while the recyclable and biodegradable wastes shall be transported to Montogawe site for processing.

## *3.6 Processing Facilities:*

All of the 22 barangays of the municipality have established their own individual MRF. But the municipality has a centralized Material Recovery Facility (MRF) situated at Montogawe Site, Brgy. Bangac where some collected recyclables wastes from urban barangays, public or private buildings and commercial establishments are placed in. Other recyclables collected may be brought directly to junkshops having a MOA signed with the municipality.

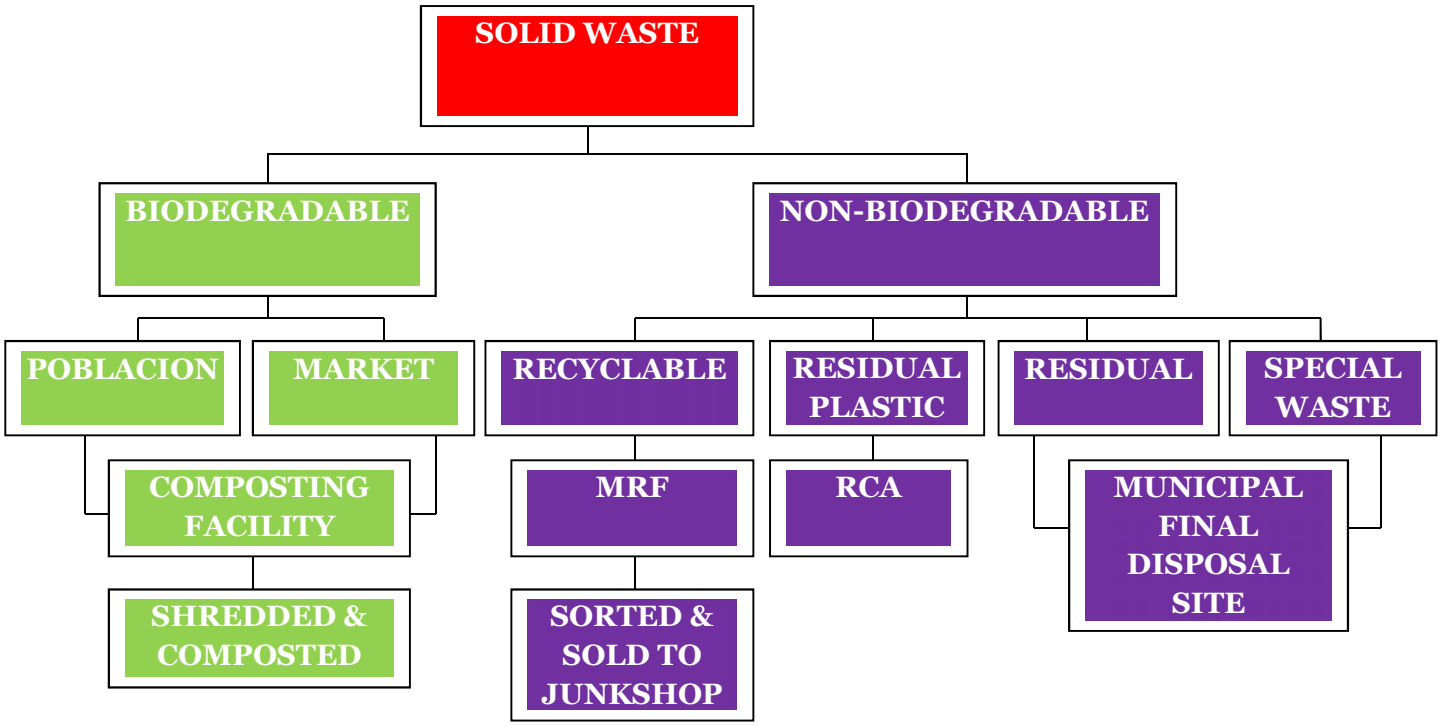
Biodegradable wastes are brought to the processing facility for soil conditioner/enhancer also situated at Montogawe site at Barangay Bangac.

Residual wastes are further classified and brought to final disposal area as follows:

- plastic cellophanes are packed properly and brought to residual containment area (RCA);
- diaper, sanitary napkins and candy wrappers are brought to the final disposal chamber and be covered with soil weekly; and
- health care, special and hazardous waste are brought to placenta, burial and sharp pits provided for within the disposal site.

***Processing***

- Solid waste are segregated into biodegradable and non-biodegradable



## *3.7 Final Disposal*

***3.7.1 Description of facilities for final disposal of solid waste or residues from processing.***

At present LGU-Mina is utilizing an area of one (1) hectare as controlled dumpsite with an active area of 1,000 square meters located at Brgy. Amiroy being utilized as a dumping site/disposal facility for the residual waste being collected in the whole municipality.

The area is owned by the LGU. There were five (5) waste pickers coming to the area to recover some remaining recyclable materials that can still be recovered within the dumpsite.

There is an existing Material Recovery Facility which collects and recover the recyclable materials within the dumpsite and the collected recyclable materials were collected by the junkshop every quarter.

3.*7.2. List of facilities including location, ownership, capacity, types of materials accepted, source of materials, brief description of operation.*

The municipality has a centralized Material Recovery Facility (MRF) situated at Montogawe Site, Brgy. Bangac and a one (1) hectare as final disposal site with an active area of 1,000 square meters and a residual containment area located at Brgy. Amiroy

.

a. Segregated recyclables are properly stored before collection. These recyclables are collected separately and brought to the MRF and recycling centers/junkshops;

b. Segregated residuals like plastic cellophane are packed properly and brought to the Residual Containment Area (RCA) provided at the Final Disposal and Recovery Facility at Brgy. Amiroy; while

c. Residuals like diaper, sanitary napkins and candy wrappers are disposed to the final disposal chamber and be covered every week-end by soil;

d. Health care, special and hazardous wastes shall placed in to the placenta, burial and sharps pit provided at the disposal site;

e. Compostable ones shall be brought to the composting facility at eco-agri park, montogawe site, Brgy. Bangac.

*3.7.3 Evaluation of the situation of scavengers / waste pickers working at existing disposal site.*

The average scavengers/waste pickers coming to the area to recover the remaining recyclables that can be recovered is five (5) they are mostly minors aging from ten (10) to twelve (12) years old and they come from the neighboring barangays.

## *3.8 Special Wastes*

The Municipality is responsible in bringing toxic, hazardous and pre-treated wastes generated at Health Center, Birthing Facilities, T-B Dots and Laboratory into the Eco-Park/Final Disposal Site and Recovery Facility at Barangay Amiroy and disposed properly into high density plastic container sealed with concrete. However, recyclables extracted for some of the selected hazardous wastes (e.g. used batteries, paint cans and bottles, etc.) shall be brought to its appropriate recyclers and junkshop operators.

Quantity of special wastes generated and disposed per day including household, establishment, institutions and market is 51.30 kgs.

### 3.8.1 Health Care Waste

**Existing treatment and disposal practice of infectious and other health care wastes.**

a. Placenta or human waste from delivery, urine and stools from medical & drug testing laboratory and medical supply used are disinfected with lysol and disposed to the placenta / burial pit at municipal controlled dumpsite.
b. Infectious wastes such as syringes, blades, I.V. needles and empty vials of medicines are also disinfected and disposed to the sharps pit at municipal disposal site.

## *3.9 Markets for Recyclables*

### *3.9.1 List of junk shops in the city/municipality. Include types and quantities of materials accepted.*

There is only one junkshop in the municipality owned by Mr. Gorgonio Pangantihon at Brgy. Cabalabaguan. These shop caters for the 1,616.95 kilograms per day of recyclable materials generated by households, market and commercial establishments in the whole municipality.

**Table 12**

| Junkshop | Items | Price |
|---|---|---|
| 1. Gorgonio Junkshop | | As prevailing market price |
| | Cartoon | |
| | Newspaper | |
| | Plastics | |
| | Mineral water bottles | |
| | Mono block chair | |
| | ***Metals*** | |
| | Aluminum-pots | |
| | Aluminum cans | |
| | Hard Aluminum (heavy alloy) | |
| | Steel | |
| | Copper | |
| | Zinc | |
| | Stainless Steel | |
| | Lead washer (tingga) | |
| | G.I. sheet | |
| | Tin cans | |
| | ***Batteries*** | |
| | 7 plates | |
| | 9 plates | |
| | 11 plates | |
| | 15 plates | |

### *3.9.2 List of industries in the city/municipality that use recycled materials*

**Not applicable**

## *3.10 Intensive Education Campaign (IEC)*

The technical working group on solid wastes, solid waste management board (SWMB), LGU personnel concerned, barangay official shall educate people in the proper garbage management and disposal and in the case of school the task to teach school children shall be the responsibility of the teachers. IEC is being conducted through the following activities:

a) Monthly regular meetings and conferences for SWMB and other local special bodies ;
b) Continuous IEC in the 22 barangays through pulong-pulong;
c) Meetings / dialogues with poultry and piggery owners;
d) Information, dessimination campaign in different schools;
e) Leaflets, streamers and posters; and
f) Billboards with text “No segregation, no collection”

## *3.11 Cost and Revenues*

The CY 2014 appropriation for environmental management and related concern has a total of P975,000.00 itemized as follows:

**Table 13**

| 2014APPROPRIATION FOR ENVIRONMENTAL MANAGEMENT | |
|---|---|
| Personal Services | |
| Salaries & Other Benefits of MENRO-Designate | P230,000.00 |
| Wages of 3 Job Hired Personnel (1 Driver and 2 Utility Workers) | P200,000.00 |
| MOOE | |
| Office Supplies | P10,000.00 |
| Traveling Expenses | P15,000.00 |
| Seminars & Trainings | P15,000.00 |
| Gas & Oil | P20,000.00 |
| Other MOOE | P20,000.00 |
| Repairs & Maintenance of Office | P30,000.00 |
| Repairs & Maintenance of Shredder Machine | P10,000.00 |
| Repairs & Maintenance of Controlled Dumpsite | P20,000.00 |
| Repairs & Maintenance of Garbage Compactor | P50,000.00 |
| Capital Outlay | |
| Purchase of Office Equipment (IT Equipment) | P30,000.00 |
| Purchase of Furniture & Fixtures | P15,000.00 |
| 20% Development Fund | |
| 1. Improvement of Controlled Dumpsite | P50,000.00 |
| 2. Tree Planting / Environmental Sanitation /Beautification | P40,000.00 |
| 3. Counterpart in Rabies Vaccination | P40,000.00 |
| 4. Solid Waste Management | P80,000.00 |
| 5. Development / Rehabilitation of Suague River | P30,000.00 |
| 6. Development / Rehabilitation of Public Plaza | P70,000.00 |
| **TOTAL** | **P975,000.00** |

Previous year's expenditures affecting environmental management for CY 2013 was P29,912.00 used for the repair of garbage compactor.

Record shows that the total of P105,754.00 was collected from the solid wastes collection for CY 2013.

## *3.12 Key Issues*

Some key issues facing the community relative to solid waste management are laxity of all concerned to seriously comply and abide with the policy in as far as implementation of the plan, lack of self discipline among the populace to cooperate and weak implementation of local ordinance relative to solid wastes.

## *4.0 Waste Characteristics*

Uses results of WACS and recycling information to determine quantity and composition of waste generated.

## *4.1 Disposed Waste (from WACS)*

*LGU-Mina is generating a solid waste of equivalent to 0.35 kilogram of waste per person per capita with the average household membership of five (5) member per family.*

**Table 14**

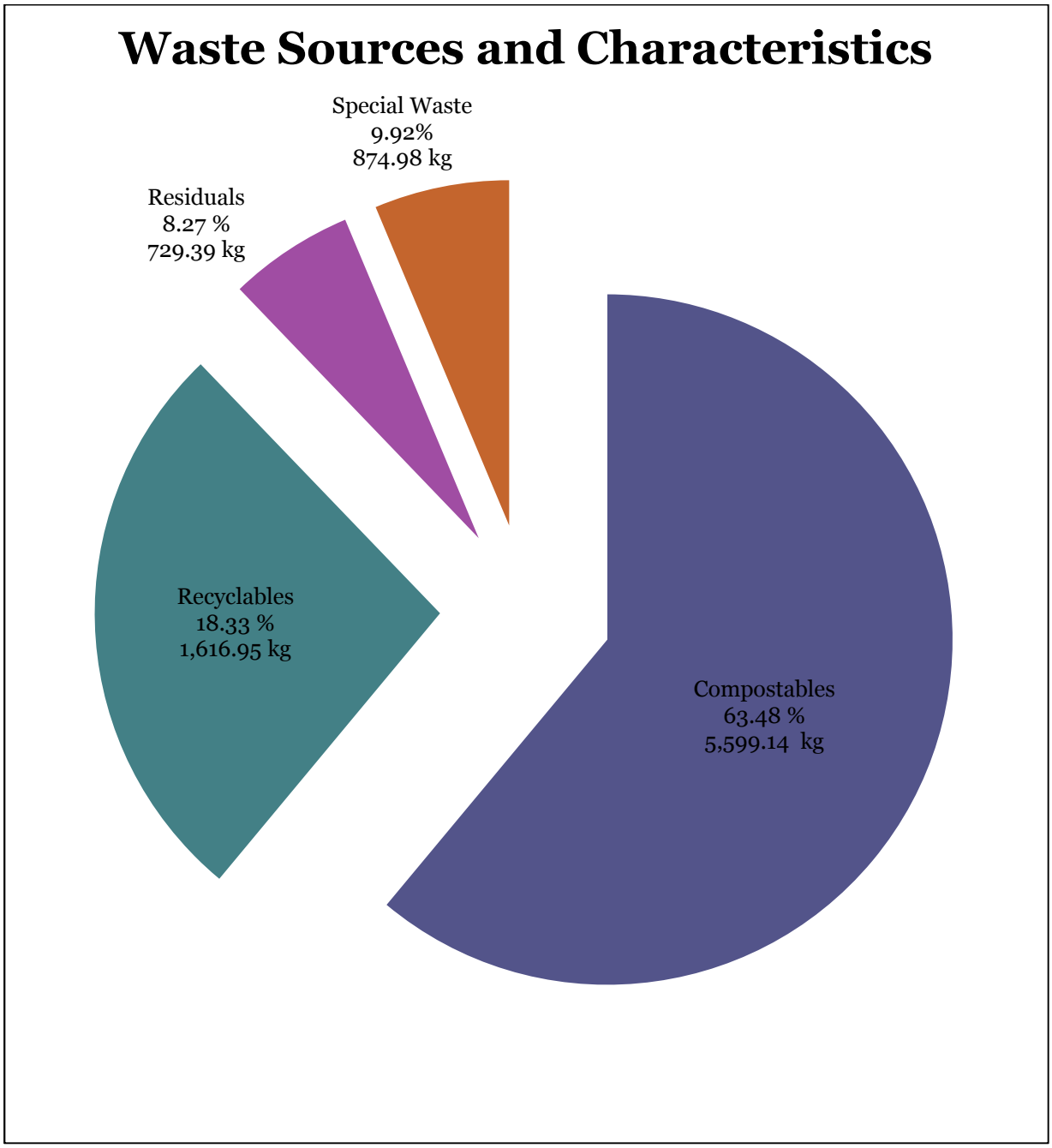
**Quantity of Waste disposed by sector per day**

| Type of Waste / Waste Sources | Weight (kg.) | Percentage |
|---|---|---|
| **Households** | **8,454.25** | **95.85** |
| **Establishments** | **49.10** | **0.56** |
| **Institutions** | **29.29** | **0.33** |
| **Market Waste** | **287.81** | **3.26** |
| **TOTAL** | **8,820.45** | **100.00** |

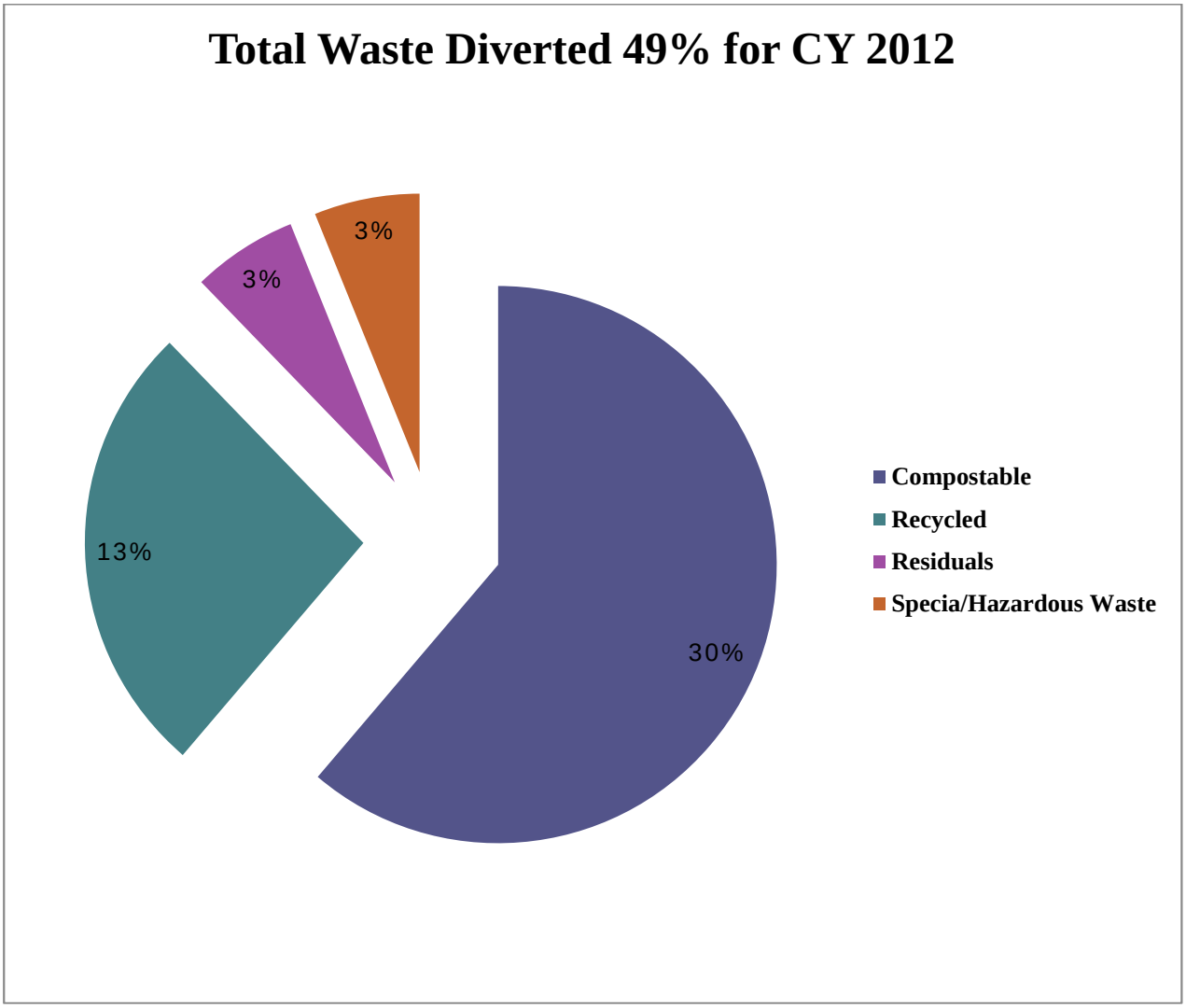
**Table 15**

Municipal Waste Composition % Share at All Sources

| WASTE SOURCES | Total (kg.) | % Share | Waste Composition | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compostables | | Recyclables | | Residuals | | Special | |
| | | | Total (kg.) | % Share | Total (kg.) | % Share | Total (kg.) | % Share | Total (kg.) | % Share |
| Household | 8454.25 | 95.85 | 5388.74 | 96.24 | 1476.96 | 91.34 | 719.46 | 98.63 | 869.10 | 99.33 |
| Establishments | 49.10 | 0.56 | 28.59 | 0.51 | 15.77 | 0.98 | 3.83 | 0.53 | 0.91 | 0.10 |
| Institutions | 29.29 | 0.33 | 13.28 | 0.24 | 13.06 | 0.81 | 2.27 | 0.31 | 0.68 | 0.08 |
| Market Waste | 287.81 | 3.26 | 168.53 | 3.01 | 111.16 | 6.87 | 3.83 | 0.53 | 4.29 | 0.49 |
| Total | 8820.45 | 100.00 | 5599.14 | 100.00 | 1616.95 | 100.00 | 729.39 | 100.00 | 874.98 | 100.00 |
| Total % Share | | | 63.48 | | 18.33 | | 8.27 | | 9.92 | 100.00 |


Waste Sources and Characteristics
Special Waste
9.92%
874.98 kg
Residuals
8.27 %
729.39 kg
Recyclables
18.33 %
1,616.95 kg
Compostables
63.48 %
5,599.14 kg

## *4.2 Diverted Waste*




Estimated quantity of waste currently recycled and composted

Table 16

| | | |
|---|---|---|
| Quantity of Waste Composted | 1,679.74 Kg. | 30% |
| Quantity of waste recycled and sold to junkshops | 210.20 kg. | 13% |

4.3 Generated Waste

Estimated quantity of waste generated (disposed + diverted)

Projection of quantity of waste generated based on population projection in kilograms

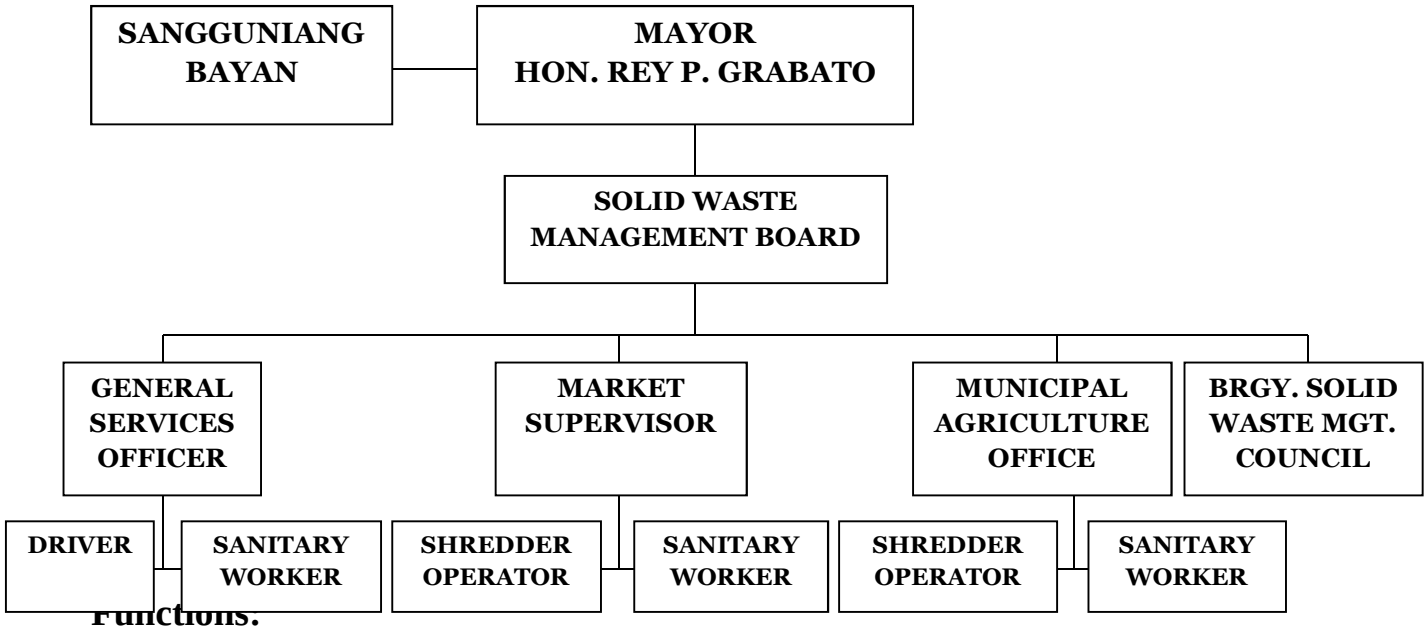
Table 17

| 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| 8,454.25 | 8,619.10 | 8,785.35 | 8,951.60 | 9,116.45 | 9,282.70 | 9,448.25 | 9,613.45 | 9,779.35 | 9,945.25 |

## *5.0 Legal / Institutional Framework*

The Solid Waste Management Board is responsible in handling the entire waste management activities to include garbage collection, processing and sorting for residual containment operation, municipal street sweepers and IEC program initiatives. The lifestyle change project focused on the changed behavior as a mechanism for sustainability. The whole initiative of capacitating people towards change to promote waste diversion at source is already a process of ensuring sustainability. People's attempt at such segregation is already a manifestation of change in people's attitude and orientation towards waste. See Structure for IEC Program headed by a Manager.

**ECOLOGICAL SOLID WASTE MANAGEMENT PROGRAM**
**ORGANIZATIONAL FRAMEWORK**




**Functions:**

**I. Mayor**

- Acts as overall program manager
- Provides program direction
- Secures funds for the program both from internal and external sources

**II. Sangguniang Bayan**

- Set policies and guidelines through legislative measures
- Provides legislative support
- Provides financial support

**III. Solid Waste Management Board**

- Formulate the Municipal Solid Waste Management Plan;
- Adopt measures to promote and ensure the sustainability and effective implementation;
- Monitor and oversee the implementation of the Solid Waste Management Program;
- Adopt specific revenue-generating measures;
- Convene regular meetings; and
- Monitor and evaluate the program.

**IV. Market Supervisor**

- In charge of the information and Education Campaign (IEC) of Solid Waste Management Program to all stall occupants holders within the public market;
- In charge of daily collection of both bio and non-biodegradable wastes within the public market;
- Coordinate with the Municipal Agriculture Office for the shredded materials for composting;
- Enforce and implement local ordinances pertaining to solid waste within the market premises.

**V. General Services Office**

- In charge of IEC to all residents and occupants of buildings in major thoroughfares and disseminate the schedule of collection and other information needed by the public;
- In charge of the daily collection of both bio and non-biodegradable wastes and supervise the collection operation of the garbage compactor;
- Coordinate with the Agriculture Office during the transport during the transport of waste to the ecological agri-park and communal garden; and
- Enforce local ordinances pertaining to cleanliness and waste management.

**VI. Municipal Agriculture Office**

- Supervise the ecological park and communal garden and take charge of the MRF, shredder and other support facilities within the eco-park and communal garden;
- In charge of composting processes and operation
- In charge of composting processes and operation

**VII. Driver**

- Operate garbage truck
- Transport collected waste from source to MRF 1 and 2

**VIII. Sanitary Worker**

- Collect both biodegradable and non-biodegradable wastes from source;
- Conduct information and dissemination campaign;
- Monitor the cleanliness of all public places;and
- Monitor the final sorting / segregation of bio and non bio-degradable wastes.

**IX. Shredder Operator**

- In charge of the operation and maintenance of shredder machine

## *5.1 Local Laws and Regulations*

The Solid Waste Management Board in coordination with various departments particularly the Municipal Engineering Office and the Municipal Health Office jointly implement permitting procedures for various establishment as well as inspection and compliance with the National Building Code and Sanitation Code of the Philippines (P.D. 856) as well as other related local ordinances.

Local Ordinances enacted in relation to Solid Waste Management:

- Ordinance No. 94-04 – An Ordinance prohibiting the throwing and spreading of rubbish cigar/cigarette butts and similar materials in the public plaza, public road or square within the poblacion, Municipality of Mina, Province of Iloilo adopted August 15, 1994;
- Ordinance No. 94-05 – An Ordinance requiring all household owners within the territorial jurisdiction of Mina, Iloilo to put up a water-sealed sanitary toilet;
- Ordinance No. 97-01 – Rabbies Control Ordinance for the Municipality of Mina adopted February 12, 1997;
- Ordinance No. 2009-144-A – An Ordinance requiring all households to put-up Septic Tank in their Backyard Piggery adopted June 24, 2009;
- Ordinance No. 2010-157 – An Ordinance Amendments Ordinance No. 96-018 on Comprehensive Solid Waste Management Ordinance adopted September 7, 2010;
- Ordinance No. 2011-172 – Ordinance Regulating Backyard Piggery in the Municipality of Mina, Iloilo adopted January 5, 2011;
- Ordinance No. 2011-190 – Anti-Smoking Ordinance in the municipality of Mina, Iloilo adopted June 20, 2011;

- Ordinance No. 2011-196 – Amendments of Dog Control Ordinance of the Municipality of Mina adopted August 10, 2011;
- Ordinance No. 2011-172 – Ordinance Regulating Backyard Piggery in the Municipality of Mina, Iloilo adopted January 5, 2011;

## *5.2 Roles*

It shall be the responsibility of the Municipal Solid Waste Management Board to formulate plans and policies as regards to the solid waste management program of the municipality and approved by the municipal mayor.

The municipality, through the Sangguniang Bayan shall enact laws and ordinances consistent with the priorities identified by the MSWMB. The municipal mayor as head of the municipality shall execute and implement programs and projects relative to solid waste management.

The barangay shall create a Barangay Solid Waste Management Committee responsible to prepare plans and programs pertaining to proper implementation of garbage disposal.

Private entities and institution as generators, citizens, NGOs and recycling companies shall be empowered and get involved in the government efforts to properly implement the solid wastes management program. Their active participation in the plan formulation are enjoined.

## 5.3 Municipal Solid Waste Management Board

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

On July 1, 2013 the Local Chief Executive passed an Executive Order No. 02-004 series of 2013 "An Order Re-Organizing the Municipal Solid Waste Management Board".

The Municipal Solid Waste Management Board Compositions:

| | | |
|---|---|---|
| Chairman: | **Hon. Rey P. Grabato** | Municipal Mayor |
| Vice Chairman: | **Hon. Celso S. Justado** | SB Member, Chair. Committee on Environmental Protection |
| Members: | **Hon. Felipe Allaga** | SB Member, Chair. Committee on Health |
| | **Hon. Arnel C. Matta** | Liga President |
| | **Hon. Jon Cliff A. Grabato** | SK Federated President |
| | **Mr. Edwin L. Labordo** | District Supervisor |
| | **Mr. Gil P. Abillera** | Principal, Mina National High School |
| | **Engr. Luisa A. Alfin** | OIC-MPDC |
| | **Engr. Xykster C. Pelaez** | OIC-MAO |

**Mr. Licerio C. Patingo** MGDH (GSO) / ICO-MEO
**Dr. Janeatte A. Sobrevega** MHO
**Mr. German D. Salanio** EMS-I (MENRO-Designate)
**NGO Representative to promote recycling / protect air and water quality**
**A recycling Industry Representative**
**A Manufacturing Industry Representative**

**Activities:**

- Drafting and submission of the (10) Year SWM Plan to NSWMC, Manila
- Establishment of Final Disposal Facility
- Plan for the rehabilitation and closure of the existing dumpsite
- Local and International networking and other SWM related activities

The Municipal Solid Waste Management Board (MSWMB) has the following functions:

a) Develop the Municipality's Solid Waste Management Plan that shall ensure the long-term management of solid waste, as well as integrate the various solid waste management plans and strategies of the barangays in its area of jurisdiction. In the development of the Solid Waste Management Plan, it shall conduct consultation with the various sectors of the community;

b) Adopt measures to promote and ensure the viability and effective implementation of solid waste management programs in its component barangays.

c) Monitor the implementation of the Municipal Solid Waste Management Plan through its various political subdivisions and in cooperation with the private sector and the NGOs;

d) Adopt specific revenue-generating measure to promote the viability of its Solid Waste Management Plan;

e) Convene regular meetings for purposes of planning and coordinating the implementation of the solid waste management plans of the respective component barangays;

f) Oversee the implementation of the Municipal Solid Waste Management Plan;

g) Review every (2) years or as the need arises the Municipal Solid Waste Management Plan for purposes of ensuring its sustainability, viability, effectiveness and relevance in the fields of solid waste management;

h) Develop the specific mechanics and guidelines for the implementation of the Municipal Solid Waste Management Plan;

i) Recommend to appropriate local government authorities specific measure or proposals for franchise or build-operate-transfer agreements with duly recognized institutions, pursuant to RA 6967, to provide either exclusive or non–exclusive authority for the collection, transfer, storage, processing, recycling or disposal of municipal solid waste. The proposals shall take into consideration on contacts, franchise and build- operate-transfer agreements;

j) Provide the necessary logistic and operational support to its components cities and municipalities in consonance with subsection (f) of the Local Government Code;

k) Recommend measures and safeguards against pollution and for the preservation of the natural ecosystem; and

l) Coordinated the effort of its component barangays in the implementation of the municipal Solid Waste Management Plan.

## *5.4 Barangay Solid Waste Management Committee*

### 5.4.1 List of BSWM Committees formed to date and schedule for Boards in other barangays:

## *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 plan formulation.

## *6.0 Plan Strategy*

## *6.1 Vision*

It is envisioned that Mina shall be pollution free by the next ten years, with sustainable solid waste management, collection, composting and dumping in a developed and well-managed dumping facility, progressive and resilient to climate change and disaster.

## *6.2 Targets*

## *Diversion targets for each year, 10-year planning period: Table 18*

| | *2015* | *2016* | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | *2023* | *2024* |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Waste Composted (kg./year)*** | ***Composted (30%) 613,105.10 kg/year.*** | ***729237.63 kg/year = (35%)*** | ***743303.57 kg/year = 35%*** | ***757369.51 kg/year = (35%)*** | ***881505.14 kg/year = (40%)*** | ***897580.50 kg/year = (40%)*** | ***913588.18 kg/year = (40%)*** | ***1045757.27 kg/year = (45%)*** | ***1063803.97 kg/year = (45%)*** | ***1081850.68 kg/year = (45%)*** |
| ***Waste Recycled or sold to junkshops (kg/year)*** | ***Recycled (13% ) 76723.00 kg./year*** | ***108305.07 kg./year (18%)*** | ***110394.12 kg./year (18%)*** | ***112483.17 kg./year (18%)*** | ***146375.35 kg/year (23%)*** | ***149044.69 kg/year (23%)*** | ***151702.79 kg/year (23%)*** | ***187910.77 kg/year (28%)*** | ***191153.56 kg/year (28%)*** | ***194396.35 kg/year (28%)*** |

***Disposal Targets for each year, 10-year Planning period: Table 19***

| 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| 1997741.02 kg/yr. (78.52%) | 1902433.56 kg./yr. (74.43%) | 1939128.76 kg./yr. (74.43%) | 1975823.96 kg./yr. (74.43%) | 1870201.27 kg./yr. (70.34%) | 1904306.76 kg./yr. (70.34%) | 1938268.64 kg./yr. (70.34%) | 1822407.98 kg./yr. (66.26%) | 1853857.41 kg./yr. (66.26%) | 1885306.83 kg./yr. (66.26%) |

a) Well-informed and disciplined citizenry, cooperative and active in terms of solid waste management;
b) Well-developed controlled dumpsite, accessibility and transportation facilities;
c) Active solid waste management board (SWMB) and barangay solid waste management committee;
d) Active participation and involvement of CSOs / Pos, NGAs and other stakeholders;
e) Sustainable organic farming and vegetable production; and
f) Sustainable drainage system.

Coordination with barangays to implement segregated collection shall be done through radio communications or through cellphones or meetings; and

Collection of recyclable wastes maybe stored in the MRF for scrappers to buy and pick them out for sale or may be directly taken out from the source such as houses or establishments that generates garbage.

## *6.3 Strategies*

a) Conduct regular meetings consultative meetings and conferences;
b) Strengthening the capacity of MSWMB and BSWMCs in development planning through trainings and seminars;
c) Improvement and construction of comprehensive drainage system;
d) Improvement of controlled dumpsite for residual, hazardous and special wastes;
e) Improvement of material recovery facilities for recyclable wastes both in the poblacion and in the barangays;
f) Maintenance of eco-park;
g) Reconstruction of organic composting facility and composting of biodegradable wastes.; and
h) Maintain leachate pond at the final disposal site.

Coordination with barangays to implement segregated collection shall be done through radio communications or through cellphones or meetings; and

Collection of recyclable wastes maybe stored in the MRF for scrappers to buy and pick them out for sale or may be directly taken out from the source such as houses or any establishments that generates garbage.

The Mina disposal site is not a guarantee to accommodate the needs of the municipality in terms of waste disposal and to its very limited space. Thus, the municipality decided to share with the municipality of Janiuay as they are coming up

with their proposed sanitary landfill which can cater even large volume of wastes coming from other municipalities.

## *7.0 SWM System*

- Regular meetings, consultations and conferences is very essential in the strengthening and activating the role of every stakeholders particularly the members of SWMB. It is in this venue where issues and concerns affecting solid waste management program are thoroughly discussed, decided and approved;

- Capacity building seminar for the MSWMB and BSWMB in the prioritization for effective development planning formulation and implementation;

- Construction of drainage system is needed to prevent the municipality from flooding;

- The controlled dumpsite where residual waste, hazardous / special wastes are to be dumped should be develop maintained and improved;

- MRF and eco-park must be kept maintained for sustainable vegetable production;

- The previous composting facility was damaged during the devastation of typhoon Frank and it needs to reconstructed to make it profitable; and

- Leachate pond needs to be maintained to keep water treated before it goes down to the open field.

### *7.1 Source Reduction*

Reduction at source of solid wastes to be collected shall be strictly imposed. There shall be mandatory segregation of garbage before transportation to its designated dumping area. Recyclable shall be placed or stored in the nearest MRF, compostable ones shall either be brought to the composting facility for shredding and composting or be composted at source where it is situated. In doing so, only residual, special, and hazardous are brought to their respective dumping places.

#### *7.1.1 Source reduction programs to be implemented and implementation schedule.*

The rural barangays shall be responsible for the segregation and collection of recyclable and biodegradable wastes and initiate processing and storage through their respective material recovery facilities (MRFs). However, for the urban barangays the biodegradable and non-biodegradable materials collected will be handled by the municipality.

The MRF shall be established in every barangay. For this purpose, the barangay or cluster of barangays shall allocate a certain parcel of land for the MRF whose site and actual establishment shall be determined by the clustered barangays. The residual wastes will be temporarily deposited in the barangay MRF.

### *7.1.2 Sectors to target*

Composting is the process that produces soil conditioner/enhancer. It is considered an income generating activity, and collecting and selling recyclables materials also generates income for the scavengers. Target sectors for this are farmers for the composting and scavengers for recyclable wastes and junkshop owners.

Materials to be addressed are the non-biodegradable, they will be segregated in accordance with this categories. Those that are saleable shall be diverted and be brought directly to the market for sale.

It is also encourage that every household, establishments, institutions and market should segregate their waste and establish a composting activity. With this initiative, it will not just reduce the volume of waste to be collected but also will help in the economic well-being of every sector due to generation and production of soil conditioner/enhancer. In effect only residual wastes shall be subject for collection while the recyclable ones may either be sold out at junkshop or be stored at the MRF.

### *7.1.3 Materials to be addressed and methods to determine the categories of solid waste to be diverted.*

**Table 20**

| Types of Wastes | Waste Collected (in Tons)/Year | Waste Diverted (in Tons)/Year | (%) Percentage of Waste Diversion |
|---|---|---|---|
| **Biodegradable** | **2,043.69** | **613.11** | **30%** |
| **Non-biodegradable** | **590.19** | **76.72** | **13%** |
| **Total** | **2,633.88** | **689.83** | **43%** |

### *7.1.4 Capability and economic viability of the municipality in implementing the program for this component.*

The LGU has a 1 hectare Municipal Disposal Site at Barangay Amiroy intended for the above purpose in which the Department of Environment and Natural Resources (DENR) upon submission of the LGU of the Safe Closure Plan have issued to us an Authority To Close (ATC # : SCRP-EMB R6 #65-0602-09, dated May 18, 2009.

Analyzing WACS result – Residual and Special Waste comprise a very minimal percentage which is so manageable considering that we have a Municipal Controlled Dumpsite as a final Disposal Area.

As a fifth class LGU it is very impractical and economically not feasible to go with the Sanitary Landfill for the terrain is generally plain and so with other alternative technology (ex. Biomass Technology, Co-Processing, Mechanical Biological Treatment [MBT] and Poly-green Technology) as a final disposal of our solid waste generated, as it needs large capital investment.

The least we can do is to develop and make-use of our disposal site. Concentrate more on the Information Education Campaign (IEC), making our constituents aware of the effect of Global Warming and Climate Change. Fully implement our 10-Year Ecological Solid Waste

Management Plan (ESWMP). Comply the 3R's Solid Waste Management – **Recycle** all recyclable waste (Kwarta Sa Basura), **Re-use** all re-usable waste (MalikhaingPinoy), in order to **Reduce** the residual waste for final disposal to the disposal site.

### *7.1.5 Technical requirements for the ordinances and other formal actions to be taken by the municipality.*

1. Conduct regular meetings with Solid Waste Management Board.
2. Organize Barangay Solid Waste Management Committee and assist them in the formulation of their solid waste management plan/program.
3. Intensify the information, education campaign.
4. Involve and organize transport groups to become strong partners in the implementation of solid waste management program.
5. Strictly implement the anti-littering ordinance.

### *7.1.6 Social impacts on stakeholders involved or affected.*

The social impacts on stakeholders involved or affected is the Climate Change contributed by excessive greenhouse gas emissions specifically carbon dioxide and methane gas. There would be an adaptation measures that the local community should strategize in order to mitigate its negative impact.

### *7.1.7 Estimated diversion resulting from source reduction.*

**Table 21**

| Percentage Diversion of the Types of Wastes per Year of the Ten-Year Planning Period | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| **BIODEGRADABLE IN TONS** | **613.11** | **729.24** | **743.30** | **757.37** | **881.51** | **897.58** | **913.59** | **1045.76** | **1063.80** | **1081.85** |
| **Percentage (%)** | **19.04** | **22.22** | **22.22** | **22.22** | **25.39** | **25.39** | **25.39** | **28.57** | **28.57** | **28.57** |
| **RECYCLABLE IN TONS** | **76.72** | **108.27** | **110.39** | **112.48** | **146.38** | **149.05** | **151.70** | **187.91** | **191.15** | **194.40** |
| **Percentage (%)** | **2.38** | **3.30** | **3.30** | **3.30** | **4.22** | **4.22** | **4.22** | **5.13** | **5.13** | **5.13** |
| **TOTAL WASTE IN TONS** | **689.83** | **837.51** | **853.69** | **853.69** | **1027.89** | **1046.63** | **1065.29** | **1233.67** | **1254.95** | **1276.25** |
| TOTAL PERCENTAGE (%) | 21.42 | 25.52 | 25.52 | 25.52 | 29.61 | 29.61 | 29.61 | 33.70 | 33.70 | 33.70 |

### *7.2 Collection*

**User Fees for Solid Waste Management Services**

a. Commercial, industrial/institutional, establishments shall be charge an annual garbage fees as stipulated in the Comprehensive SWM Ordinance (Payment shall be made to the Municipal Treasurer of the Municipal Government of Mina).

b. Residential units covered within the collection points shall be charge an amount depending on the rate as approved in the Comprehensive SWM Ordinance.

**On residential Areas:**

The collection of segregated recyclable is the responsibility of residents and residuals is the responsibility of the municipality while the collection of compostable is the responsibility of the barangay.

**On Public Market and Thoroughfares:**

The collection of segregated recyclable is the responsibility of the vendor while residuals and compostables is the responsibility of the municipality.

***7.2.1 Overview***

The Municipality of Mina has initiated strategies in order to come up with a systematized collection system to include but not limited to the conduct of baseline waste collection data on current collection schedules, routes, and fuel consumption, work out a cost effective route and schedule for the municipality's garbage collection including rural barangays, follow-up and monitor compliance of collection route and schedule and regular briefing of collection crew for systematic implementation of "No segregation, No collection" Policy.

**7.2.2 Collection equipment and routes**

**Table 22**

Collection Vehicle, Frequency and Collection Routes

| Collection Vehicle | Frequency | Collection Routes |
|---|---|---|
| Garbage Compactor | Daily (MWF) A.M. | Residual Waste of Households and Establishments |
| | Daily (MWF) P.M. | Residual Waste of MTH, Market, MNHS, MCS, Church, Street Parks, Playground & Plaza |
| | Daily (TTH) | Biodegradable Waste of Market, Street Parks, Playgrounds & Plaza. |

**Current number of vehicles and the projection of procurement of vehicles by year in the ten year planning period**

**Table 23**

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|
| Type of Vehicles | Current | Proposed | | | | | | | | |
| Payloader | 1 unit | / | | | | | | | | |
| Road Grader | 1 unit | | | | | | | | | |
| Dumptruck | 2 units | / | | | | | | | | |
| Toyota Hilux | 1 unit | | | | | | | | | |
| Service Jeep | 1 unit | | | | | | | | | |
| Garbage Compactor | 1 unit | | | | | | | | | |
| Elf Truck | 1 unit | / | | | | | | | | |

### 7.2.3 Private collection service

The local government is not hiring private contractor for the municipality's garbage collection since the current waste collection activity is being done by administration through the General Services Office.

### 7.2.4 Storage and Setout

- In every designated place there shall be three (3) enclosed receptacles for the biodegradable and non-biodegradable wastes (plastics & cans).
- It shall be the main responsibility of the head of the family, owner or manager of an establishment or enterprise, head teacher, principal, supervisor or superintendent of a school, to ensure the cleanliness and orderliness of their premises as well as the surrounding vicinity.

**Household / Residential Sources**

- Residents and household members are required to segregate their solid waste into biodegradable and non-biodegradable wastes. They shall ensure that the solid wastes are properly placed or contained in the enclosed receptacles.
- There shall be an instituted system where household receptacles and communal depositories duly provided by the municipality or barangays shall be assigned or placed in a strategic location to serve the need of a cluster of residential units.
- The constituent members of a cluster shall have the primary responsibility of ensuring the cleanliness and orderliness of their premises as well as their common vicinity. They shall ensure further that their assigned receptacles are properly maintained and in good order.
- Public thoroughfares and grounds in front or in the vicinity of residential houses must be kept clean and orderly by the owner or lessee of the house or building at all times.
- Tree cuttings and other materials of agricultural nature, including those bulky materials emanating from the garden, shall be stored and collected separately.

**Commercial, Industrial, Institutional, Market Sources**

- Solid wastes generated from these establishments shall be segregated into biodegradable, recyclables, residuals, toxic and hazardous wastes. These particular wastes should be duly segregated and shall be placed in an enclosed bag prior to their storage in the assigned receptacles within the premises of the establishments.
- Health Center, Birthing Facilities, TB Dots Center, Laboratory, pharmaceutical and mortuary wastes shall be stored, collected, transported and disposed of in accordance with pertinent national laws, rules and regulations and guidelines of other agencies of the government like the Department of Health.

- Construction debris shall be disposed of by and with the expense of the owner of the building, contractor, sub-contractor or whoever the in- charge of the construction.

### 7.2.5 Segregated recyclables

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

- The collection vehicle is garbage compactor, it collects segregated recyclables every Monday, Wednesday and Friday (MWF).In the morning at the individual households and establishments and in the afternoon at the Mina Town Hall, Market, Mina National High School, Mina Central School and thoroughfares.

### 7.2.6 Segregated compostable

- All biodegradable materials will be collected by the municipality and will be composted either by windrow, vermin-composting or practical and appropriate composting technologies available. However, the respective barangays should encourage to the processing of their green generated wastes. The necessary carbon material for enhancing digestion such as; rice hull, sawdust, or sugarcane tops will be introduced in the biodegradable waste pile windrows.
- The collection vehicle is garbage compactor, it collects segregated compostables every Tuesday and Thursday (TTH). In the morning at the Mina Town Hall, Market and Thoroughfares.

### 7.2.7 Mixed solid waste/residuals

SOLID WASTE MANAGEMENT PLAN
(2015-2024)

- Residents and household members are required to segregate their solid waste into biodegradable and non-biodegradable wastes. They shall ensure that the solid wastes are properly placed or contained in the enclosed receptacles.

- The non-biodegradable (residuals), special, toxic and hazardous wastes shall be properly sealed, preferably in plastic containers, prior to their temporary storage at the assigned receptacles and the “drop off” centers strategically located within the commercial establishments of the municipality.

- Solid wastes generated from establishments shall be segregated into biodegradable, recyclables, residuals, toxic and hazardous wastes. These particular wastes should be duly segregated and shall be placed in an enclosed bag prior to their storage in the assigned receptacles within the premises of the establishments.

- Health Center, Birthing Facilities, TB Dots Center, Laboratory, pharmaceutical and mortuary wastes shall be stored, collected, transported and disposed of in accordance with pertinent national laws, rules and regulations and guidelines of other agencies of the government like the Department of Health.

- Construction debris shall be disposed of by and with the expense of the owner of the building, contractor, sub-contractor or whoever the in- charge of the construction.

- The non-biodegradable (residuals), special, toxic and hazardous wastes shall be properly sealed, preferably in plastic containers, prior to their temporary storage at the assigned receptacles and the "drop off" centers strategically located within the commercial establishments of the municipality.

- Collection of residual wastes shall be done every Monday, Wednesday and Friday as shown in table 20

**Table 24**

Collection Vehicle, Frequency and Collection Routes for 5 years

| Collection Vehicle | Frequency | Collection Routes | Projected Collection (Tons per Year) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2015 76.72T | 2016 108.27T | 2017 110.39T | 2018 112.48T | 2019 146.38T |
| Garbage Truck ( 1-ton cap.) | (MWF) A.M. | Residual Waste of Households and Establishments | 74.40 | 104.99 | 107.05 | 109.07 | 141.94 |
| | (MWF) P.M. | Residual Waste of MTH, Market, MNHS, MCS, Church, Street Parks, Playground & Plaza | 2.32 | 3.28 | 3.34 | 3.41 | 4.44 |

## *7.3 Segregation, Recycling and Composting*

Segregation, recycling and composting of segregated materials are the responsibility of the barangay. The SWM plan should describe how the municipality will work with the barangay to implement the programs.

### 7.3.1 Segregation

- The imposition of the municipality's "**No Segregation, No Collection**" policy enhances the implementation of segregated collection.

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

**Household Logbook**
(CMFM BF Form # 1)

Name of Household Head:_____
Purok:_____Monitored by:_____

**Table 25**

| Indicators | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segregation at Source | | | | | | | | | | | | |
| Segregated Collection | | | | | | | | | | | | |
| Backyard Composting | | | | | | | | | | | | |

**Purok SWM Report Record**
(CMFM BF Form # 2)

Purok:_____Barangay_____
Period covered:_____TotalHhs:_____

**Table 26**

| Indicators | Jan | | Feb | | Mar | | Apr | |
|---|---|---|---|---|---|---|---|---|
| Segregation at Source | | | | | | | | |
| Segregated Collection | | | | | | | | |
| Backyard Composting | | | | | | | | |
| | | | | | | | | |

**Barangay CMFM Record**

(CMFM BF Form # 3)

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

Households:

**Table 27**

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

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segregation at Source | | | | | | | | | | | | |
| Segregated Collection | | | | | | | | | | | | |
| Backyard Composting | | | | | | | | | | | | |

### 7.3.2 Recycling

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

**Implementation:**

**Residential Areas:**

a. Segregated recyclables shall be properly stored before collection. These recyclables shall be collected separately and brought to the recycling center, eco-centers or junk dealers.
b. Local waste managers shall be designated in every barangay who shall oversee the collection of the recyclables and shall be responsible in coordinating with the accredited dealers of manufacturers of the recycle product.
c. Food and kitchen refuse shall be collected as fodder or feeds for animals those portion that are not suitable as fodder shall be composted.
d. Residence shall avoid open burning and dumping and adopt recycling practicing F's scheme (feed, fermentable, food and fuel). Fuel materials from household waste consist of two kinds (a) firewood materials consist of twigs, branches, leaves, husk, shells, cobs, chaffs, saw dust, wood shaving, soiled papers, biogases, stalks, etc.; and (b) flammable gas-produced by anaerobic decomposition of all biomass or biodegradable materials in biogas digester.

**Commercial Areas:**

a. Segregation of waste from commercial areas (shopping malls, restaurant, commercial complexes, recreational center, etc.) shall be mandatory before issuance of or renewal of business permits.
b. Markets / Agoras shall adopt the segregation scheme that will facilitate the segregation of recyclable, foods/vegetables waste, non recyclable, etc.
c. Food wastes from commercial centers (e.g. food centers, restaurant, canteens, etc.) shall be collected as fodder/animals feeds shall not be disposed to sewers.

**Industrial / Institutional Areas:**

a. In industrial establishments segregation of biodegradable /compostable and non-biodegradable/non compostable waste shall be performed to avoid foul odors and proliferation of flies.
b. School (both private and public) shall adopt appropriate resources recovery and recycling strategies.
c. Hazardous waste shall be incinerated only after getting proper assistance / guidance from concerned agencies.

IMPLEMENTATION SCHEDULE

Segregated Recyclables

Table 28

| Schedule of Collection | Waste Sources |
|---|---|
| MWF (A.M.) | Households and Establishments |
| MWF (P.M.) | Mina Town Hall, Market, Mina National High School, Mina Central School, Church, Street Parks, Playground and Plaza. |

**Agricultural Areas (including farms for livestock, poultry, etc.):**

a. Agricultural waste (e.g. rice straws, corn cobs, etc.) shall not be burned but shall be stock-pitted in a proper location and composted animal manure can also be composted or used for biogas production.

**Enforcement of Regulations:**

- Any individual person or persons who violate the Comprehensive Solid Waste Management Ordinance shall upon conviction be punished by a fine as follows;

  1st Offense P1,500.00 or 10 days community work or both at the discretion of the court.

  2nd Offense P2,000.00 or 15 days community work or both at the discretion of the court.

  3rd Offense P2,500.00 or 20 days community work or both at the discretion of the court.

Recyclable waste for diversion:

- Papers:
  - Dry and clean paper like bond paper, news paper, magazine, etc.

- Cartoons of pizza, detergent, toothpaste, shoes, etc.

- Plastics:
  - Pet bottles for softdrink, mineral water, vinegar, oil, alcohol, noodles, shampoo, etc;
  - Broken monoblock chair and table, bowl, pail,etc.
  -

- Scrap iron:
  - Aluminum and tin cans for softdrinks and sardines;
  - Galvanized iron sheet, steel, bronze, lead, etc.

- Glass / bottles:
  - Bottles of beer, gin, softdrink, juice, vinegar, soy sauce, catsup, peanut butter, coffee, etc.
  - Broken bottles

Recycling methodology:

- Segregate white paper to colored paper
- Fold the cartoon to save space
- Do not collect papers if there is rain
- Fold the steel bars
- Put the bottles and broken glasses in a proper place made of heavy duty materials
- One color of bottles or broken glasses in every container
- Cleanse the plastic, bottles and broken glasses to avoid cockroaches and ants

### 7.3.3 Composting/ Management of Biodegradable Waste

**Composting**

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

The huge biodegradable heaps will be processed at the composting facility of the Eco-Agri Park. The compost product will be introduced to the municipality's vast agricultural area as an enhancer or soil conditioner.

**Vermin-Composting:**

Biodegradable waste shall be shredded into small particles and stock in sacks for 15 days for decomposition and put to the compost bin with the presence of vermin-worm (Night Crawler). Moist the biodegradable material everyday for biological decomposition under controlled predominantly aerobic conditions to a state that is sufficiently stable for nuisance-free storage and handling and is satisfactorily matured for safe use in agriculture.

Compost must be produced through a process that combines plant and animal materials with an initial C:N ratio of between 25:1 and 40:1.

Aside from composting facility established by the municipal government, all households are enjoined to have their backyard composting activity at home. With this, initiative, they may able to produce soil enhancer for their own consumption without spending so much expenses purchasing in-organic fertilizer they need.

Every barangay household is monitored by their Barangay Kagawad, chairman committee on environmental protection.

### 7.3.4 Marketing

The Municipality markets the recyclable materials and electronic wastes to the lone junkshop operator in the municipality.

Likewise, Rain-fed farmers and vegetable planters were the target markets for the compost produced to promote the utilization of soil conditioner/enhancer out from the processed green wastes and other biodegradable waste materials.

## 7.4 Transfer (Not applicable)

## 7.5 Alternative Technologies for Residual Wastes (Not applicable)

## *7.6 Disposal*

After passing through all prescribed waste processing treatments such as composting, segregation at source or at the MRF, etc., the remaining 10-20% will remain as residual waste. This waste fraction consists of non-recyclables as well as multi-component parts unable to segregate due to contamination, small sizes or other reasons.

The treatment for residual waste is to dispose it in a residual containment area (RCA). In order to reduce the environmental impacts related to waste disposal leachate collection pond and biological treatment are being established which hinder the seepage of waste pollutants thus controls negative impacts of leachate contamination to the underground water.

### 7.6.1 SW Disposal Capacity

The local Government Unit starts its operation of open dumping on the site by year 1995. The waste capacity volume of the whole area is approximately 30 to 40 cubic meters with estimated lifespan of Eight (8) to Ten (10) years but as mentioned only Eighty (80) square meters out of One (1) hectare was utilize as waste area. The present waste area has an estimated capacity of Twenty Thousand (20,000) cubic meters the estimated present capacity after years of operation is estimated at 3,600 cubic meters or a lifespan of 1 to 2 years to accommodate the waste volume of the poblacion.

Table 29

| Disposal Capacity in cu.m. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| | 2314.02 | 2236.39 | 2279.53 | 2322.66 | 2235.61 | 2276.38 | 2316.98 | 2220.58 | 2258.90 | 2297.22 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

### 7.6.2 Existing Facilities

The former open dumpsite at Brgy. Amiroy was officially closed on May 18, 2009 with an approved authority to close **(ATC # : SCRP-EMB R6 # 65-0602-09)** for the safe closure and rehabilitation plan and a Municipal Controlled Dumpsite was opened at the same location.

### 7.6.3 New Facilities

**The municipality of Mina is proposing to establish an "Eco-Center"** which is an integrated solid waste management system where vital facilities were installed for the mass composting of biodegradable materials, recycling of the non-biodegradable residual wastes to enable the municipality to comply with the mandatory waste diversion and installation of final disposal facility (residual containment area).

The approach of technology used in project implementation is entirely a pioneering application since the system is an integration of a waste processing area for biodegradable and non-biodegradable waste, a residual containment area (RCA) utilizing the space at the final disposal area for the residual waste such as (plastic cellophane, candy and biscuit wrappers) and leachate collection pond and biological treatment.

### 7.6.4 Sanitary Landfill (SLF) Design (Not applicable)

## *7.7 Special Wastes*

The Municipality is responsible in bringing toxic, hazardous, and health center, birthing facilities, tb-dots center and laboratory wastes into the drop center and disposed of in a designated area in the final disposal site. However, prior to final disposal the pre-treated wastes (e.g. syringe, needles) will be stored in a high density plastic container after which such container is sealed with concrete.

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

Table 30

| QUANTITIES OF SPECIAL WASTES TO BE GENERATED IN THE FUTURE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| YEAR | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| | 874.98 | 892.04 | 909.25 | 926.45 | 943.51 | 960.72 | 977.85 | 994.95 | 1012.12 | 1029.29 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

### 7.7.1 Existing treatment and disposal practice of infectious and other health care wastes.

a. Placenta or human waste from delivery, urine and stools from medical & drug testing laboratory and medical supply used are disinfected with lysol and disposed to the placenta / burial pit at municipal controlled dumpsite.
b. Infectious wastes such as syringes, blades, I.V. needles and empty vials of medicines are also disinfected and disposed to the sharps pit at municipal disposal site.

## *7.8 Information, Education, and Communication (IEC)*

- Special Bodies Meeting / SWMB Meeting;
- The Technical Working Group on Solid Waste Management go house to house campaign to educate clients on garbage collection for proper soild waste disposal;
- Continuous Information Education Campaign in various barangays and purok-purok;
- IEC in various Elementary School;
- Meeting / Dialogue of the Department Heads concerned with the Poultry and Backyard Piggery Owners;
- Massive information dissemination at different schools through PTA meetings, information drive and integration in the different lessons;
- Contacting and utilizing school personnel to help in the dissemination on proper solid waste management; and
- Massive information and education campaign to all brgy. Officials, household owners, establishment owners and vendors.

### 7.8.1 Introduction

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

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

### 7.8.2 Core Messages

The project training modules will patterned those developed by the Solid Waste Association of the Philippines (SWAPP), to be adapted by the Municipality of Mina environs and viewed through Power Point Software.

The project training modules will patterned those developed by the Solid Waste Association of the Philippines (SWAPP), to be adapted by the Municipality of Mina environs and viewed through Power Point Software.

### 7.8.3 Approach

Two fliers will be developed. The first discussed ecological solid waste management and its principles. Composting principles, especially in application to home and kitchen waste, will be discussed in the other flier. These materials were distributed to the Sangguniang Barangay and all other groups that underwent the ESWM trainings.

Three (3) posters with similar advocacy relative to ESWM information will be posted around strategic areas in the municipality like the market, LGU offices, schools, churches. Banners with five (5) different information on ESWM will be constructed out from plastic sack cloth and will be likewise distributed to participating barangays for posting in strategic areas.

**Barangay Training on Ecological Solid Waste Management (ESWM)**

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

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

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

MATRIX OF PLANNED ACTIVITIES

Table 31

| Planned Activities | Target Audience | Subject of Message | Responsible Person/Party | Implementation Schedule | Budget/Logistics |
|---|---|---|---|---|---|
| **1. Pulong-pulong sa Barangay** | **Brgy. Officials/residents Schools** | **Segregation at Source, composting and proper disposal of solid waste** | **MENRO/DA/Treasury/ SBs** | **January 2016** | **1,000.00** |
| **2. Trainor's Training** | **Bgry. Solid Waste Mgt. Committee/Schools** | **RA 9003/Ordinances** | **MENRO/DA/Treasurer** | | **5,000.00** |
| **3. Safe Closure & Rehabilitation of Municipal Controlled Dumpsite** | | | **MENRO/MEO** | **April 2016** | **100,000.00** |
| **4.Establishment of Plant/Tree Nursery** | | | **MENRO/MEO** | **January 2016** | **15,000.00** |

## *8.0 Implementation Strategy*

Discussion of the logistics of how the solid waste management system will be implemented.

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

### 8.1 Framework

- Overview of the program to be implemented, generator segment by year include source reduction, recycling management of biodegradable disposal and alternative technologies.

- Residents and household members are required to segregate their solid waste into biodegradable and non-biodegradable wastes. They shall ensure that the solid wastes are properly placed or contained in the enclosed receptacles.

- The non-biodegradable (residuals), special, toxic and hazardous wastes shall be properly sealed, preferably in plastic containers, prior to their temporary storage at the assigned receptacles and the "drop off" centers strategically located within the commercial establishments of the municipality.

- Solid wastes generated from establishments shall be segregated into biodegradable, recyclables, residuals, toxic and hazardous wastes. These particular wastes should be duly segregated and shall be placed in an enclosed bag prior to their storage in the assigned receptacles within the premises of the establishments.

- Health Center, Birthing Facilities, TB Dots Center, Laboratory, pharmaceutical and mortuary wastes shall be stored, collected, transported and disposed of in accordance with pertinent national laws, rules and regulations and guidelines of other agencies of the government like the Department of Health.

- Construction debris shall be disposed of by and with the expense of the owner of the building, contractor, sub-contractor or whoever the in- charge of the construction.

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

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

- The Municipality is responsible in bringing toxic, hazardous, and health center, birthing facilities, tb-dots center and laboratory wastes into the drop center and disposed of in a designated area in the final disposal site. However, prior to final disposal the pre-treated wastes (e.g. syringe, needles) will be stored in a

high density plastic container after which such container is sealed with concrete.

- Likewise, other recyclables extracted in some of the selected hazardous waste (e.g. used motor batteries) will be brought to its appropriate recyclers for further treatment and proper disposal.
- After passing through all prescribed waste processing treatments such as segregation at source, recycling, composting or at the MRF, etc., the remaining 10-20% will remain as residual waste. This waste fraction consists of non-recyclables as well as multi-component parts unable to segregate due to contamination, small sizes or other reasons.
- The treatment for residual waste is to dispose it in a residual containment area (RCA). In order to reduce the environmental impacts related to waste disposal leachate collection pond and biological treatment are being established which hinder the seepage of waste pollutants thus controls negative impacts of leachate contamination to the underground water.

Goal:

An enhanced ecologically balance and sustainable Municipality of Mina Solid Waste Management Program.

Objectives:

1. To establish a waste processing and final disposal facility.
2. To set up an effective Solid Waste Collection System.
3. To undertake rehabilitation and closure of Municipal Controlled Dumpsite.
4. To institutionalize IEC, monitoring and enforcement mechanism for the municipality's SWM Program.

## 8.2 Waste Diversion Projections

**Table 32**

| Type of Waste | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|
| A. Biodegradable | 939.34 | 957.67 | 976.09 | 994.51 | 1012.90 | 1031.27 | 1049.77 | 1068.11 | 1086.53 | 1107.72 |
| B. Non-Biodegradable | 414.52 | 422.61 | 430.74 | 438.87 | 446.99 | 455.09 | 463.25 | 471.34 | 479.47 | 488.82 |
| Total (in Tons) | 1353.86 | 1380.28 | 1406.83 | 1433.38 | 1459.89 | 1486.36 | 1513.02 | 1539.45 | 1566.00 | 1596.54 |

**Table 33**

**Waste Diverted**

| Type of Waste | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Biodegradable | 270.66 | 276.25 | 281.80 | 287.30 | 292.83 | 298.35 | 303.87 | 309.38 | 314.93 | 320.43 | 325.96 |
| Non-Biodegradable | 51.78 | 52.83 | 53.89 | 54.94 | 56.00 | 57.05 | 58.11 | 59.16 | 60.22 | 61.27 | 62.33 |
| Total (in tons) | 322.44 | 329.08 | 335.69 | 342.24 | 348.83 | 355.40 | 361.98 | 368.54 | 375.15 | 381.70 | 388.29 |

## 8.3 Monitoring Program

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

Monthly Accomplishment Report from every barangay will be required to be submitted to the MENRO Office to check the activities implemented on solid waste management programs.

## 8.4 Alternative Analysis

The municipality has no other option of waste diversion except for the utilization of central material recovery facility and barangay MRFs for the processing of bio and non-bio wastes in order to increase waste diversion.

## 8.5 Incentive Programs

### Annual Search for the Cleanest & Greenest Barangay

The yearly award giving to the Cleanest & Greenest Barangay held during the culmination of PASKWA HALAD SA BANWA (Every December) together with the Search for Outstanding Minanhon's and all other AWARDS.

# *9.0 Institutional Aspect – Planned structure for the implementation of plan*

## 9.1 Roles

It shall be the responsibility of the Municipal Solid Waste Management Board to formulate plans and policies as regards to the solid waste management program of the municipality and approved by the municipal mayor.

The municipality, through the Sangguniang Bayan shall enact laws and ordinances consistent with the priorities identified by the MSWMB. The municipal mayor as head of the municipality shall execute and implement programs and projects relative to solid waste management.

The barangay shall create a Barangay Solid Waste Management Committee responsible to prepare plans and programs pertaining to proper implementation of garbage disposal.

Consultation meetings and conferences are regularly held involving all stakeholders. They are allowed to share ideas as additional inputs for an effective plan formulation.

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

Private entities and institution as generators, citizens, NGOs and recycling companies shall be empowered and get involved in the government effort to properly implement the solid wastes management program. Their active participation in the plan formulation is enjoined.

**Participatory Approach**

The local government recognized that success of solid waste management does not just lies on the technical methods in disposing waste. Thus, people's participation was utilized wherein all sectors of the community were targeted to become involved in waste diversion at their level. These include the private/industrial/agricultural sector, the schools, the 22 barangays and all households. Citizens are further given the responsibility to manage waste in the purok level.

## Waste Minimization and Increase Waste Diversion

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

## Behavioral Change Approach

The Local Government of Mina went beyond the conventional solid waste management program of using an efficient collection system and infrastructure. Instead, it embarked on a comprehensive education and advocacy that sought to change people's behavior towards responsible waste management. While

information, education and communication is enunciated in R.A. 9003, the Behavioral Change Approach is based on an education platform that enables the target audience to learn the positive or negative consequences of their action. It further focuses on the benefits derived from positive waste management practice thus leading to individual and group motivation.

## 9.2 Legal

The municipality has been working out specific ordinance relative to enforcement entitled "AN ORDINANCE DECLARING CERTAIN PROHIBITED ACTS REGARDING WASTE DISPOSAL AND PROVIDING PENALTIES THERE OF'' which have gone already its public hearing and be soon passed. It manifested its commitment to collaborate and participatory form of governance by entering into a partnership with a Non-Government Organization, to implement the initial phase of the SWM program – the information, education and communication initiative. The Solid Waste Management Board recognized that such technical component/facilities are useless if the source of the waste, households and institutions do not exercise responsibility in segregation. The Board will design the IEC initiative to go beyond just the simple manner of providing knowledge but was directed towards changing people's attitude and behavior emphasizing early on project planning and design that waste management is people's responsibility.

# 10. Social and Environmental Aspects

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

## 10.1 Social Aspects

The waste diversion efficiency expresses the fact that citizen responsibility is increasing with most households doing segregation efforts. This also indicates that the avowed goal of changing lifestyle that promotes individual and household responsibility in solid waste management is taking root. In this manner, the project has significantly changed people's attitude and orientation towards waste. Policies of the government, whether those stipulated in R.A. 9003 as well as the LGU policy of "No Segregation, No Collection" could not be realized without people's new knowledge and changed behavior in segregating and diverting waste. Proof of such change is exhibited in the different manner by which community associations and institutions are initiating their own respective SWM initiatives. All Twenty Two (22) Barangays have been covered in the IEC campaign. All barangays have also established their own Materials Recovery Facility.

## 10.2 Environmental Aspects

For the rehabilitation and final closure of existing dumpsite, the municipality has been issued **Authority To Close (ATC)** Code: ***(SCRP-EMB R6 No. 65-0602-09)*** for the safe closure and rehabilitation plan submitted to EMB-DENR 6 dated May 18, 2009 based on the guidelines and standards of safe closure set by EMB-DENR Region VI.

# 11. Cost Estimates/Financial Aspects

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

### 11.1 Investment cost

Table 34

**Cost Estimation for Municipality of Mina Eco-Center**

| | | TIME LINE |
|---|---|---|
| Site Development<br>Access Road<br>Earthmoving for MRF<br>Perimeter Fence | **400,000.00** | **2015-2019** |

| | | |
|---|---|---|
| Rehab. composting facility<br>Rehab. Of material recovery facility (MRF)<br>Shredding & Composting<br>Hauling of residual wastes from source to final disposal site<br>Hauling of recyclable wastes from source to MRF<br>Provision of treatment pond at the final disposal site | **200,000.00** | **2015-2019** |
| Improvement of Final Disposal Site | **60,000.00** | **2015-2019** |
| Tree Planting Environmental Sanitation and Beautification (GAD) | **60,000.0** | **2015-219** |
| Development/Rehab. Of Suague River (GAD) | **50,000.00** | **2015-2019** |
| Sum for Eco-Center Construction | **770,000.00** | **2015-2019** |

## 11.2 ANNUAL COSTS (ANNUAL BUDGET FOR SOLID WASTE MANAGEMENT)

The matrix presentation below shows the budgetary allocation for the city's solid waste management program for the last eight (8) years in ***Millions per Year***:

**Table 35**

| Sources of Funds | CY 2006 | CY 2007 | CY 2008 | CY 2009 | CY 2010 | CY 2011 | CY 2012 | CY 2013 |
|---|---|---|---|---|---|---|---|---|
| Source 1 – 20 % Dev't. Fund (20% of IRA Allocation) | - | - | - | 100,000 | 100,000 | 100,000 | 150,000 | 260,000 |
| Source 2 – Provincial Aid | | | | | | | | |
| Total Program Budget | - | - | - | 100,000 | 100,000 | 100,000 | 150,000 | 260,000 |

## 11.3 Funding Options

CY 2013-2014 Budget

**Table 36**

| Budgetary Items | Amount |
|---|---|
| 1. Sanitation and Environmental Protection Program | **60,000.00** |
| 2. Rehabilitation of Composting and Material Recovery | **45,100.00** |

| | |
|---|---|
| Facility(MRF) | |
| 3. Construction of Leachate Pond | **30,000.00** |
| 4. Painting of Sidewalk and Curve at National Road | **49,900.00** |
| **Total** | **185,000.00** |

**Sources of Revenues:**

Record shows that the total of P105,754.00 was collected from the solid wastes collection for CY 2013.

USER FEES FOR SOLID WASTE MANAGEMENT SERVICES

a. Commercial, industrial/institutional, establishments shall be charge an annual garbage fees as stipulated in the Municipal Revenue Code (Payment shall be made to the Municipal Treasurer of the Municipal Government of Mina).

b. Residential units covered within the collection points shall be charge an amount depending on the rate as approved by the Barangay Solid Waste Management Committee. However, the amount shall not to exceed P500.00.

## Trust Fund Creation

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

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

Matrix for breakdown

Table 37

| Trust Fund Account (Trust Fund Liability – 439) | Amount in Pesos As of (December 2013) | Remarks |
|---|---|---|
| Sales of Recyclables | **968.80** | Sales still ongoing |
| Sales of Compost | - | |
| Cash Award Incentives | **30,000.00** | |
| Collection from garbage fees | **105,754.00** | |
| T o t a l | **136,722.80** | |

### 11.4 Cost Evaluation and Comparison

The Municipality of Mina has 10,975 per service capita based on the overall appropriation for solid waste management programs against the total population of 23208 inhabitants which is still dependent on government subsidy.

### 11.5 Summary

**Table 38**

| Investment Cost | Annual Cost | Annual Revenues |
|---|---|---|
| Php 770,000.00 | Php 185,000.00 | Php. 136,722.80 |
| | | |

## *12. Plan Implementation*

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

### 12.1 Phases and Responsibilities

**Table 39**

| **SWM Program Components** | **Office/Person Responsible** | TIME FRAME |
|---|---|---|
| **Milestone 1. New Eco-Center established and operational** | | |
| **ACTIVITIES** | **MSWMB** | 2015-2024 |
| **Site Assessment**<br>➢ Evaluation of possible Eco-Center Site<br>➢ Geological Site Pre-Assessment<br>➢ Hydro-Geological Site Assessment<br>➢ Geological Assessment<br>➢ Establishment of monitoring wells.<br>**Site Acquisition**<br>➢ Facilitate documents for the Lease | | |

| | | |
|---|---|---|
| Contract<br>➢ Formulate Docs for Access Road & Right of Way<br><br>**Preliminary Site Development and Permit Procedure**<br>➢ Site survey<br>➢ Requirements for Notice to Proceed for MRF and Composting issued by DENR, Iloilo<br>Site Development<br>➢ MRF Installation, Fencing, Composting area, Drainage and Water Treatment construction<br>➢ Establishment of Residual Containment Area (RCA) to complete the ECO-CENTER<br><br>Site Operation<br>➢ MRF final segregation and sorting of waste<br>➢ Composting of biodegradable materials<br>➢ Processing of recyclable materials<br>➢ Containment of residuals<br>➢ Environmentally-sound disposal of hazardous and special waste<br>➢ Environmentally-sound disposal of biodegradable health care waste<br>➢ Monitoring of underground water contamination<br>➢ Monitoring of outcome (material quality control) | | |
| **Milestone 2. Systematic Collection System** | | |
| **ACTIVITIES** | **MSWMB** | 2015-2024 |
| ➢ Baseline collection data on current collection schedules, routes and fuel consumption<br>➢ Work out a cost-effective route and schedule for the municpality's garbage collection including rural barangays<br>➢ Follow-up and monitor compliance of collection route and schedule<br>➢ Briefing of collection crew for systematic | | |

| | | |
|---|---|---|
| implementation of No Segregation, No Collection Policy | | |
| OUTPUT:<br><br>Milestone 4A. Institutionalize ESWM capability building and education through the Municipal LGU (MSWMB, DepEd) | | |
| **ACTIVITIES** | **MSWMB** | 2015-2024 |
| ➢ Implementation of environmental education in schools curricula<br>➢ Environmental advocacy | | |
| Milestone 4B. Monitoring and Evaluation | | |
| **ACTIVITIES** | **MSWMB** | 2015-2024 |
| **Milestone 4C. Enforcement and Compliance** | | |
| **ACTIVITIES** | **MSWMB** | 2015-2024 |
| ➢ Preparation in the conduct of meetings/seminar with Brgy. Waste Officers for monitoring and enforcement of the municipality's SWM Plan (e.g. module, content, etc.)<br>➢ Identification of all different enforcement groups and introduction seminars and WS about the laws, etc.<br>➢ Conduct paralegal training/seminars for enforcement of the Municipality's SWM Ordinance | | |

## 12.2 Milestones

- 1995 – The LGU acquired a 1 hectare lot to utilized as dumpsite and startsits operation of open dumping on the site.

- September 25, 1996 Adoption of Ordinance No. 96-018 known as a Comprehensive Solid Waste Management for the Municipality of Mina, Iloilo.
- February 9, 2009 – Submission of Safe Closure and Rehabilitation Plan.
- May 18, 2009 – Issuance of approved AUTHORITY TO CLOSE (ATC) and REHABILITATION WASTE DISPOSAL FACILITY.
- July 28, 2010 – Issuance of Executive Order No. 02-014 an order Re-organizing the Municipal Solid waste Management Board.
- September 7, 2010 – Adoption of Ordinance No. 2010 – 157 An ordinance amending ordinance no. 96-018 on Comprehensive Solid Waste Management Ordinance.
- May 18 – 12, 2012 – Conduct of Waste Analysis and Characterization Study (WACS)
- September 5, 2012 – Adoption and Approval of the 10-Year Ecological Solid Waste Management Plan

## 12.3 Implementation Schedule

Table 40

| ACTIVITIES | OFFICE RESPONSIBLE | TIMEFRAME |
|---|---|---|
| REGULAR MEETINGS, CONSULTATIONS AND CONFERENCES | MENRO, MEO & MPDC | 2015 - 2024 |
| CAPACITY BUILDING SEMINAR | MENRO, MSWDO, MPDC & DA | 2015 - 2024 |
| IMPROVEMENT OF FINAL DISPOSAL SITE | MENRO & MEO | 2015 - 2024 |
| REHABILITATION OF COMPOSTING FACILITY | MENRO, MEO & DA | 2015 - 2024 |
| MAINTENANCE OF LEACHATE POND | MENRO & MEO | 2015 - 2024 |
| MAINTENANCE OF ECO-AGRI PARK | MENRO & DA | 2015 - 2024 |

| DIVERSION GOALS AND QUANTITIES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| **BIODEGRADABLE IN TONS** | **613.11** | **729.24** | **743.30** | **757.37** | **881.51** | **897.58** | **913.59** | **1045.76** | **1063.80** | **1081.85** |
| **Percentage (%)** | **19.04** | **22.22** | **22.22** | **22.22** | **25.39** | **25.39** | **25.39** | **28.57** | **28.57** | **28.57** |
| **RECYCLABLE IN TONS** | **76.72** | **108.27** | **110.39** | **112.48** | **146.38** | **149.05** | **151.70** | **187.91** | **191.15** | **194.40** |
| **Percentage (%)** | **2.38** | **3.30** | **3.30** | **3.30** | **4.22** | **4.22** | **4.22** | **5.13** | **5.13** | **5.13** |
| **TOTAL WASTE IN TONS** | **689.83** | **837.51** | **853.69** | **869.85** | **1027.89** | **1046.63** | **1065.29** | **1233.67** | **1254.95** | **1276.25** |
| **TOTAL PERCENTAGE (%)** | **21.42** | **25.52** | **25.52** | **25.52** | **29.61** | **29.61** | **29.61** | **33.70** | **33.70** | **33.70** |

| Milestone 2. Systematic Collection System | Office Responsible | TIME FRAME |
|---|---|---|
| ACTIVITIES | MENRO & Engineering Office & MPDO | CY 2015-2024 |
| ) Baseline collection data on current collection schedules, routes and | | |

| | | |
|---|---|---|
| fuel consumption<br>J Work out a cost-effective route and schedule for the municipaliity's garbage collection including coastal and upland barangays<br>J Follow-up and monitor compliance of collection route and schedule<br>J Briefing of collection crew for systematic implementation of No Segregation, No Collection Policy | | |
| OUTPUT:<br>Milestone 4A. Institutionalize ESWM capability building and education through the Municipal LGU (MSWMB), DepEd) | Office Responsible | TIME FRAME |
| ACTIVITIES | MENRO & Engineering Office & MPDO | CY 2015-2024 |
| J Implementation of environmental education in schools curricula'<br>J Environmental advocacy | | |
| Milestone 4B. Monitoring and Evaluation | | |
| ACTIVITIES | MENRO | CY 2015-2024 |
| J Facilitate coordinative and logistical follow through support re: ESWM IEC initiative for the 22 barangays of the municipality.<br>J Preparation course of all MRF Operators "Ecological Operation of MRF" (Segregation skills, waste stream monitoring, basic book keeping and marketing, etc.) | | |
| Milestone 4C. Enforcement and Compliance | | |
| ACTIVITIES | MENRO& Engineering Office | CY 2015-2024 |
| J Preparation in the conduct of meetings/seminar with Brgy. Waste Officers for monitoring and | | |

| | | |
|---|---|---|
| enforcement of the municipality's SWM Plan (e.g. module, content, etc.)<br>- Identification of all different enforcement groups and introduction seminars and WS about the laws, etc.<br>- Conduct paralegal training/seminars for enforcement of the municipality's SWM Ordinance | | |

## References

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