

Chapter 8. Environment Sector

Waste Generation

The management of waste is one of the most challenging problems that any developing nation faces. Waste management can either make or break a nation, as for Cavite, a province. It is stipulated in the Local Government Code that it is the responsibility of the Chief Local Executive to ensure that the waste generated in the area of his/her governance is taken-care of and complies with the provisions of the Solid Waste Management Act or RA 9003.

By definition, solid wastes are Solid or semisolid, non-soluble material (including gases and liquids in containers) such as agricultural refuse, demolition waste, industrial waste, mining residues, municipal garbage, and sewage sludge.

Proper management of waste is an attribute of maintaining the well-being of people. As of December 2015, the highest volume of residential wastes was observed in the City of Bacoor with 260 tons of wastes daily. It is followed by the City of Dasmariñas which is producing residential wastes of 250 tons per day. The third highest residential waste producer is the City of Imus with 130 tons.

In terms of market wastes, it is also the City of Bacoor that produces the highest volume of market wastes with 23.76 tons per day. The municipality of Naic also produces a large volume of market wastes at 4.12 tons followed by Kawit with 3.96 tons.

Bacoor is the locality producing the highest volume of wastes per day. Considering this, it is necessary that Bacoor come up with an effective waste management system in order to control and manage the wastes production and disposal. The second largest producer of waste is the City of Dasmariñas (252 tons/day) and City of Imus (133 tons/day) (Table 8A).

Table 8A Volume of Residential Wastes and Market Wastes Generated, Province of Cavite: as of December 2015

City/Municipality	Residential Wastes (tons/day)	Market Wastes (tons/day)	Total (tons/day)
1st District			
Cavite City	15.0000	25.0000	40.0000
Kawit	30.0000	3.9600	33.9600
Novelita	7.0000	1.0000	8.0000
Rosario	128.0000	1.0000	129.0000
2nd District			
Bacoor	260.0000	23.7600	283.7600
3rd District			
City of Imus	130.0000	3.0000	133.0000
4th District			
City of Dasmariñas	250.0000	2.0000	252.0000
5th District			
Carmona	44.8700	2.2400	47.1100
Silang	69.0000	3.0000	72.0000
Gen. M. Alvarez	40.0000	4.0000	44.0000
6th District			
Trece Martires City	17.0000		17.0000
Amadeo	5.0000	0.8000	5.8000
Gen. Trias	75.0000	2.0000	77.0000
Tanza	60.0000	6.0000	66.0000
7th District			
Tagaytay City	10.4000	8.0000	18.4000
Alfonso	1.1500		1.5000
Gen. Emilio Aguinaldo	2.0000	0.0700	2.0700
Indang	3.0000	1.0000	4.0000
Magallanes	0.0004	0.2100	0.2104
Maragondon	5.0000	2.2000	7.2000
Mendez	7.1600	1.5000	5.5000
Naic	62.5000	4.1200	66.6200
Ternate	2.0000	1.0000	3.0000
TOTAL	1,224.0804	95.8600	1,319.9400

Source: Provincial Government Environment and Natural Resources Office

Solid Wastes Disposal Systems in Cavite

Composting System

Composting is nature's process of recycling decomposed organic materials into a rich soil known as compost. Anything that was once living will decompose. Basically, backyard composting is an acceleration of the same process nature uses. By composting your organic waste you are returning nutrients back into the soil in order for the cycle of life to continue. Finished compost looks like soil—dark brown, crumbly and smells like a forest floor.

Types of Composting

- **Backyard composting** — If you have a yard and a balance of browns (fallen leaves or straw) and greens (grass clippings and food scraps), you have all you need to make compost.
- **Worm composting** (vermicomposting) — If you have a tiny yard or live in an apartment or have an abundance of food scraps, this type of composting is for you.
- **Grass-cycling** If you have grass clippings and don't want to use them in a compost pile you can leave them on the lawn to decompose.

10 good reasons why you should compost

1. Yard and food waste make up 30% of the waste stream. Composting your kitchen and yard trimmings helps divert that waste from the landfill, waterways and water treatment facilities.
2. You will significantly reduce pest problems—and your use of pesticides.
3. Healthy plants from healthy soil look better, produce better and have a much greater ability to fight off pests and diseases.
4. Adding organic materials to the soil improves moisture retention.
5. Adding decomposed organic material to the soil feeds beneficial organisms.
6. Compost amends both sandy and clay soils.
7. Compost provides a balanced, slow-release source of nutrients that helps the soil hold nutrients long enough for plants to use them.
8. Composting saves money—you avoid the cost of buying soil conditioners, bagged manure etc.
9. Feeding your plants well will improve your own diet. Plants grown in depleted soils have a reduced nutrient content.
10. Home composting is a valuable tool in educating children about nature and the cycle of life.

Source: www.recycleworks.org

Composting has been largely advocated by the government as a measure in waste management. This has been known as one of the most environment friendly method to lessen the wastes and produce other value added products from it like the compost fertilizer and ammonium gas supply.

For the year 2015, there are thirteen (13) cities/municipalities that are practicing composting with a total of nineteen (19) composting centers. No increase in the number of composting centers was recorded since 2012.



Table 8B Barangays with Composting Facility by City/ Municipality and Congressional District, Province of Cavite: 2015

City/Municipality	Barangays with Composting Facility
1 st District	
Cavite City	Bagong Pook, San Antonio
Kawit	
Noveleta	Poblacion, San Antonio I
Rosario	
2 nd District	
Bacoor	
3 rd District	
City of Imus	Alapan I-A, Tanzang Luma IV
4 th District	
City of Dasmariñas	Eco-Center at Central Market
5 th District	
Carmona	Carmona Ecology Center
Silang	
Gen. M. Alvarez	Olaes, Poblacion I, Poblacion V
6 th District	
Trece Martires City	
Amadeo	
Gen. Trias	
Tanza	Tanza Public Market, Bunga
7 th District	
Tagaytay City	
Alfonso	Marahan I
Gen. Emilio Aguinaldo	
Indang	Banaba Lejos
Magallanes	Kabulusan, Bendita I
Maragondon	Layong Mabilog
Mendez	Asis II
Naic	Sabang
Ternate	

Source: Provincial Government Environment and Natural Resources Office

Material Recovery Facility (MRF) System

A Material Recovery Facility (MRF) is a building to receive, sort, process and store recyclable materials to be shipped and marketed to end-users. A materials recovery facility accepts materials, whether source separated or mixed, and separates, processes and stores them for later use as raw materials for remanufacturing and reprocessing. The main function of the MRF is to maximize the quantity of recyclables processed, while producing materials that will generate the highest possible revenues in the market. MRFs can also function to process wastes into a feedstock for biological conversion or into a fuel source for the production of energy.

MRFs serve as an intermediate processing step between the collection of recyclable materials from waste generators and the sale of recyclable materials to markets for use in making new products. There are basically four components of a MRF facility: sorting, processing, storage, and load-out. Any facility design plan should accommodate all these activities which promote efficient and effective operation of a recycling program. MRFs may be publicly owned and operated, publicly owned and privately operated, or privately owned and operated.

There are basically two types of MRFs: dirty and clean. A "dirty" MRF receives mixed waste material that requires labor intense sorting activities to separate recyclables from the mixed waste. A "clean" MRF is a facility that accepts source separated or commingled recyclable materials. A "clean" MRF reduces the potential for material contamination.

Source: www.ecomena.org

As of 2015, there are only 101 out of 829 barangays in Cavite established their own material recovery facilities. In the municipal/city level, there is a 60.87% compliance to the RA 9003 provision on the establishment of MRFs.

Table 8C Material Recovery Facilities in Cavite by City/Municipality: 2015

City/Municipality	Number of Barangays	Barangays with MRF	Presence of Centralized MRF
1st District			
Cavite City	84	0	YES
Kawit	23	0	NO
Noveleta	16	1	YES
Rosario	20	0	YES
2nd District			
City of Bacoor	73	1	NO
3rd District			
City of Imus	97	39	YES
4th District			
City of Dasmariñas	75	3	NO
5th District			
Carmona	14	31	YES
Silang	64	0	NO
Gen. M. Alvarez	27	6	YES
6th District			
Trece Martires City	13	5	NO
Amadeo	26	0	NO
Gen. Trias	33	0	NO
Tanza	41	4	NO
7th District			
Tagaytay City	34	2	YES
Alfonso	32	1	YES
Gen. Emilio Aguinaldo	14	1	NO
Indang	36	2	YES
Magallanes	16	1	YES
Maragondon	27	0	YES
Mendez	24	0	YES
Naic	30	0	YES
Ternate	10	4	YES
TOTAL	829	101	60.87% Compliance

Source: Provincial Planning and Development Office

According to Asian Development Bank, materials recovery facilities (MRFs) were established in different barangays (community or village) of the Philippines to recover recyclable materials from municipal solid waste. Required under the Ecological Solid Waste Management Act of 2001, these facilities were constructed out of local funds, grants, and loans but have attained only a limited degree of success. This condition is attributed to the lack of, or incomplete, understanding of the basic aspects of MRFs in terms of design, construction, and operations, as well as the parameters for a successful and sustained operation.



Solid Waste Disposal System Status in Cavite

Waste management is the process of treating solid wastes and offers variety of solutions for recycling items that don't belong to trash. It is about how garbage can be used as a valuable resource. Waste management is something that each and every household and business owner in the world needs. Waste management disposes of the products and substances that you have use in a safe and efficient manner.

All local government units in Cavite have clear manner of waste disposal except for Magallanes. However, there are accepted manner such as sanitary landfill and the harmful manner of open dumpsite. Among the twenty-three localities, ten (10) are using dumpsite wherein six of which are open and the remaining four are controlled. The remaining twelve (12) LGUs are engaged into a contract to a particular sanitary landfill.

Table 8D Waste Disposal System by City/Municipality, Province of Cavite: 2015

City/Municipality	Type of Disposal	Location	Land Area
1st District			
Cavite City	By Contract/ Sanitary Landfill	Montalban, Rizal	0.01 ha.
Kawit	Open Dumpsite	Brgy. Batong Dalig	
Noveleta	By Contract/ Sanitary Landfill	San Pedro, Laguna	
Rosario	By Contract/ Sanitary Landfill	San Pedro, Laguna	
2nd District			
City of Bacoor	By Contract/ Sanitary Landfill	Montalban, Rizal	
3rd District			
City of Imus	By Contract/ Sanitary Landfill	Brgy. Pasong Buaya	
4th District			
City of Dasmariñas	Open Dumpsite	Brgy. Salawag	6.0 ha.
5th District			
Carmona	By Contract/ Sanitary Landfill	San Pedro, Laguna	1.2 ha
Silang	Open Dumpsite	Brgy. Lalaan I	
Gen. M. Alvarez	By Contract/ Sanitary Landfill	San Pedro, Laguna	
6th District			
Trece Martires City	By Contract/ Sanitary Landfill	Brgy. De Ocampo, Trece Martires City	0.18 ha.
Amadeo	Controlled Dumpsite	Brgy. Poblacion V	
Gen. Trias	Open Dumpsite	Brgy. Tapia	
Tanza	Open Dumpsite	Brgy. Sahud-Ulan	
7th District			
Tagaytay City	By Contract/ Sanitary Landfill	San Pedro, Laguna	0.4 ha.
Alfonso	Controlled Dumpsite	Brgy. Marahan I	
Gen. Emilio Aguinaldo	Open Dumpsite	Brgy. Lumipa	
Indang	By Contract/ Sanitary Landfill	Laguna	1.25 ha.
Magallanes			
Maragondon	Controlled Dumpsite	Brgy. Layong Mabilog	1.6 ha.
Mendez	By Contract/ Sanitary Landfill	Brgy. Asis II (Eco-Center) and San Pedro, Laguna	0.75 ha,
Naic	Controlled Dumpsite	Brgy. Sabang	1.3 ha.
Ternate	By Contract/ Sanitary Landfill	San Pedro, Laguna	3.0 ha.

Source: Provincial Government Environment and Natural Resources Office

Waste Disposal Equipment and Machineries

Garbage collection remains to be the number one method of waste disposal among the residential, commercial and industrial sectors of the province. Except for Magallanes, the rest of the province implements garbage collection. Garbage collection can be classified into two; Domestic waste collection coming from the residential areas and industrial waste or those coming from public markets and other industrial establishments. In terms of waste disposal equipment and machineries, the province has 7 waste compactors, 36 big garbage trucks and 121 small garbage trucks. Considering the number of population and correspondingly the volume of waste being produced, the City of Dasmariñas has the most number of big garbage trucks amounting to twelve. This is complemented by an additional of three small garbage trucks. Similarly, the populous town of Imus also has numerous garbage trucks. Despite having only two big garbage truck, there are twenty small garbage trucks roaming the entire town for garbage collection. It can be noted that the municipality of Magallanes do not have any garbage truck at all. It can also be observed that the garbage collection schedule for public markets is more frequent than the schedule for residential areas.

Table 8E Inventory of Waste Disposal Equipment and Machineries and Frequency of Garbage Collection by City/Municipality, Province of Cavite: 2015

City/Municipality	Number of Compactors	Number of Big Garbage Truck	Number of Small Garbage Truck	Frequency of Garbage Collection
1st District				
Cavite City		1	4	Main roads/market – Daily ; City Streets – Twice a week
Kawit			3	Daily
Noveleta			3	2 trips/Truck/ day
Rosario	1	2	6	Daily / Twice a day
2nd District				
City of Bacoor			6	Daily
3rd District				
City of Imus		2	20	Market - Daily ; Barangays – Once a week
4th District				
City of Dasmariñas	5	12	3	Daily
5th District				
Carmona	1	3	7	Twice a week
Silang		3	6	Public Market – Daily ; Barangays – Once a week
Gen. M. Alvarez		2	5	Thrice a week
6th District				
Trece Martires City		2	3	10-12 times / day
Amadeo			2	Thrice a week
Gen. Trias		3	17	Twice a week
Tanza			18	Twice a week
7th District				
Tagaytay City		5	5	Daily
Alfonso		1	2	Twice a week
Gen. Emilio Aguinaldo			1	10 Trips/ week
Indang			2	Daily except Saturday
Magallanes				-
Maragondon			2	Daily
Mendez			2	Five times a week
Naic			3	Once or twice a week
Ternate			1	Daily
TOTAL	7	36	121	

Source: Provincial Government Environment and Natural Resources Office

Solid Waste Management Plan

As urbanization continues to take place, the management of solid waste is becoming a major public health and environmental concern in urban areas of Cavite. The concern is serious, particularly in the highly populated and industrialized local government units. Poor solid waste management will have negative impacts on official and tourist visitors as well as investors. The creation of a Solid Waste Management Plan (SWMP) is one of the stipulations of Republic Act 9003 or Solid Waste Management Act. All Local Government Units are obliged to create their localized SWMP and implement such complying with the guidelines of the law. Having a localized sustainable and environmentally accepted and appropriate manner of waste disposal is what the RA 9003 envisions.

Table 8F Status of Solid Waste Management Plan Compliance by City/Municipality, Province of Cavite: as of December 2015

City/Municipality	Status
1st District	
Cavite City	On-going formulation and WACS already conducted.
Kawit	On-going formulation; Conducted WACS
Noveleta	On-going formulation; Conducted WACS
Rosario	Submitted the copy of their plan at DENR-EMB Region IV-A Office last November 17, 2014; Conducted WACS
2nd District	
Bacoor City	Submitted a copy of the plan to DENR-EMB IV-A; Conducted WACS for their 10-YEAR SWMP last March 2014; Approved by the NSWMC
3rd District	
City of Imus	Conducted WACS in 2013 ; Submitted a copy of their 10-Year SWMP to DENR-EMB IV-A last November 10, 2014
4th District	
City of Dasmariñas	Submitted a copy of their plan to NSWMC; Conducted WACS
5th District	
Carmona	WACS result submitted to NSWMC last October 2014; Approved by the NSWMC
Silang	On-going formulation; Conducted WACS
Gen. Mariano Alvarez	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014
6th District	
Trece Martires City	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
Amadeo	Reviewed by PGENRO last July 05, 2013; Conducted WACS
Gen. Trias	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
Tanza	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
7th District	
Tagaytay City	Submitted the copy of their Plan to NSWMC, Conducted WACS
Alfonso	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
Gen. Emilio Aguinaldo	On-going formulation
Indang	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
Magallanes	Submitted the copy of their Plan to NSWMC, Conducted WACS
Maragondon	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
Mendez	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014; Conducted WACS
Naic	Submitted the copy of their plan at DENR-EMB IV-A last November 17, 2014
Ternate	On-going formulation

Source: Provincial Government Environment and Natural Resources Office

Special Wastes Treatment

According to RA 9003, "special wastes" include consumer electronics such as worn-out, broken, and other discarded items such as radios, stereos, and TV sets. It shall also refer to household hazardous wastes such as paints, thinners, household batteries, lead-acid batteries, spray canisters and the like. These include wastes from residential and commercial sources that comprise of bulky wastes, consumer electronics, and white goods, yard wastes that are collected separately, batteries, oil, and tires. These wastes are usually handled separately from other residential and commercial wastes.

The RA 9003 stipulates that the special waste component shall include existing waste handling and disposal practices for special waste or household hazardous wastes, and the identification of current and proposed programs to ensure the proper handling, re-use, and long-term disposal of special wastes. There are twenty-four (24) companies who are catering to the needs for special wastes treatment in Cavite.

Table 8G Special Wastes Treatment Companies in Cavite: as of August 31, 2015

Company Name	Address	Type of Special Waste Treated
1. Agility Solutions, Inc.	Carmona	Wastes with Inorganic chemicals
2. Asia Metal Trading Corporation	Gen. Trias	Electronic Scraps and Hazardous Wastes
3. Asia Recycling Solutions Technology	Carmona	Wastes with Inorganic chemicals
4. Azzions Recycling Solutions, Inc.	Carmona	Waste with cyanide, acid wastes, alkali waste, waste with inorganic chemicals, inks, dyes, pigments, paints, latex, adhesives, organic sludge, waste organic solvents, waste oil/bunker sludge, contaminated containers and organic chemicals
5. Clean Echo Techwin, Inc.	Gen. Mariano Alvarez	Waste with cyanide, acid wastes, alkali wastes, wastes with inorganic chemicals, inks, dyes, latex, adhesives, waste organic solvents, organic wastes, waste oil/bunker sludge, containers previously containing toxic chemical substances and miscellaneous wastes
6. Cleanway Environmental Management Solutions (Formerly Cleanway Technology Corporation)	Silang	Hazardous and Hospital Waste
7. E-Technology Philippines, Inc.	Rosario	Wastes with inorganic chemicals
8. Fujihiro Philippines	Gen. Trias	Wastes with cyanide, stabilized wastes and wastes with inorganic chemicals
9. Green Eco Techwin, Inc.	Gen. Trias	Wastes with cyanide, acid wastes, wastes with inorganic chemicals and miscellaneous wastes
10. Green Horizon Environmental Management Inc.	Bacoor, Cavite	Hazardous wastes
11. Green Globe Environmental	Carmona	Hazardous Waste
12. Green Korea, Inc.	Rosario	Electronic Scraps
13. Integrated Waste Management Inc.	Trece Martires City	Hospital Waste ; Hazardous Waste
14. JORM Environmental Services	Gen. Trias	Hazardous Waste
15. JORM Trading Corporation	Gen. Trias	Hazardous Waste
16. Matsuda Sangyo Philippines Corporation	Carmona, Cavite	Hazardous Waste
17. MEGA Manila G.N.B. Motors Corporation	Naic, Cavite	Waste with inorganic chemicals and copper wastes, used oil as fuel of the furnace
18. O.M. Manufacturing Philippines, Inc.	Rosario	Wastes with inorganic chemicals
19. RMM Trading and Waste Management Services	Silang, Cavite	Alkali wastes, wastes with inorganic chemicals, inks, dyes, pigmanets, paints, latex, adhesives, organic sludge, waste oil, contaminated empty containers
20. Sardido Industries, Inc.	Tanza	Wastes with inorganic chemicals
21. Solvtech Consultancy	Silang	Hazardous Waste
22. Southwing Enterprises	Gen. Trias	Used oil or waste oil
23. Southcoast Metal Enterprises	Rosario	Electronic Scraps and Hazardous Waste
24. Wastes and Resource Management Inc.	Trece Martires City	Resinous materials

Source: Department of Environment and Natural Resources