ASEANO

ASEAN-NORWEGIAN COOPERATION PROJECT ON LOCAL CAPACITY BUILDING FOR REDUCING PLASTIC POLLUTION IN THE ASEAN REGION (ASEANO) 2020 – 2021

SUBPROJECT 2:

MAPPING OF SOURCES AND CONCENTRATION OF PLASTIC WASTES GENERATION IN IMUS RIVER WATERSHED

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Abstract

The sources of plastic wastes and areas of expected high levels of plastic waste generation were mapped in the Imus River Watershed in the Province of Cavite, in the Philippines. Different sources of plastic waste were identified, and used to estimate the magnitude of plastic waste generation. Information on the major sources of plastic waste were obtained from the 10-Year Solid Waste Management Plan of the seven cities and municipalities located within the boundaries of the watershed. Remote sensing technology was used to identify the coordinates of different potential sources. For higher resolution, Google Imagery was used in preparing base maps which were imported and georeferenced in ArcMap. A 7-day waste characterization study in three selected barangays was conducted to determine the average amount of plastic waste generated per household. This data served as inputs for a hotspot analysis in ArcGIS to identify plastic waste generation hotspots within the watershed. The Imus River system traverses seven cities and municipalities that include parts of Tagaytay City, Silang, and Amadeo in the upland areas, a large part of the densely populated and urbanized cities of Dasmariñas and Imus City in the central hilly areas, and portions of the lowland City of Bacoor and the coastal Municipality of Kawit. It has a total drainage area of 11,259.80 hectares. A total of 222 barangay communities were identified within the boundaries of the watershed with a total population of 1,351,057. The major sources of waste in the watershed were primarily households, followed by commercial, institutional, and industrial establishments. The total number of commercial, institutional, and industrial establishments identified was 778, and a total of 54 waste storage facilities were found in the watershed. From the 7-day characterization study in three selected barangay communities, an average of 113.03 kg of plastics was generated daily by the households in Barangay Burol 1, Dasmariñas City; 9.17 kg/day in Barangay Mabolo 1, Bacoor City; and 29.29 kg/day in Barangay Maitim 2nd Central, Tagaytay City. An average of 0.17 Kg/day per household of plastics were generated in the watershed and 0.05 Kg/day per capita. A cluster of high plastic waste generating barangays was identified in Dasmariñas City, where various tributaries of the Imus River converge. This combination is likely to create a significant hotspot for waste leakage. Clusters of low plastic waste generating barangays were identified in parts of Imus, Kawit, and Bacoor. These cold spots should not be ignored, as increasing plastic waste generation could exceed capacity and push them into future leakage hotspots.

Acronyms/Abbreviations

CALABARZON Region	Cavite, Laguna, Batangas, Rizal and Quezon Region
CENRO	City Environment and Natural Resources Office
CLUP	Comprehensive Land Use Plan
DENR	Department of Environment and Natural Resources
DTI	Department of Trade and Industry
EMB	Environmental Management Bureau
GIS	Geographic Information System
GPS	Global Positioning System
IRR	Implementing Rules and Regulation
IRW	Imus River Watershed
LGU	Local Government Unit
MENRO	Municipal Environment and Natural Resources Office
MRF	Material Recovery Facility
MRR	Material Recovery Receptacle
MSME	Micro, Small and Medium Enterprise
PEMSEA	Partnerships in Environmental Management for Seas of East Asia
PG-ENRO	Provincial Government Environmental and Natural Resources Office
RS	Remote Sensing
SLF	Sanitary Landfill Facility
SWMP	Solid Waste Management Plan
WACS	Waste Analysis and Characterization Study

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Glossary of Terms

Biodegradable. Any waste that decomposes in a reasonable amount of time. Food and kitchen waste, manure, sewage, agricultural and forestry waste, and textiles are all examples of biodegradable waste.

Collection. The process of collecting of wastes from residences, businesses, or a collection point, loading them into a vehicle, and transporting them to a processing, transfer, or disposal site.

Composting. The biological decomposition of solid organic materials by bacteria, fungi, and other organisms into a soil-like product.

Disposal. The final handling of solid waste, following collection, processing, or incineration. The most common definition of disposal is the placement of waste in a dump or a landfill.

Geographical Information System (GIS). A computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface.

Google Earth. A 3D representation of Earth based on satellite imagery. It is a geobrowser that accesses satellite, aerial imagery, ocean bathymetry and other geographic data.

Material Recovery Facility (MRF). Includes a solid waste transfer station or sorting station, drop-off center, a composting facility and a recycling facility.

Material Recovery Receptacle (MRR). Individual containers with different segregation labels located in small barangay areas.

Remote Sensing. The use of an instrument, such as a radar device or camera, to scan the earth or another planet from space in order to collect data about some aspects of it.

Residual waste. Nonhazardous industrial waste. It includes waste material (solid, liquid or gas) generated by industrial, mining and agricultural operations. It excludes certain coal mining wastes and wastes from normal farming activities.

Recyclables. Waste that can be reprocessed into feedstock for new products. Common examples are paper, glass, aluminum, corrugated cardboard, and plastic containers.

Recycling. The transformation of materials into raw materials for the manufacture of new products that may or may not be similar to the original product.

Reuse. The use of a product more than once in its original form, for the same or a new purpose

River Network. Part of a larger system watershed, which is the land drained by a river and its tributaries.

River Watershed. An area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel.

Sanitary Landfills (SLF). A waste disposal site designed, constructed, operated and maintained in a manner that exerts engineering control over significant potential environmental impacts arising from the development and operation of the facility.

***Sari-sari* store.** A small neighborhood retail shop that serves the residents of that neighborhood. The store typically sells basic goods such as canned food, instant noodles, coffee, and soda, as well as candy, chips, and beer, which Filipinos consume on a daily basis.

Solid Waste. Any garbage, refuse, or sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility, as well as other discarded materials including solid, liquid, semi-solid, or contained gaseous material, resulting from industrial and agricultural operations, and from community activities.

Solid Waste Management. The discipline concerned with the management of solid waste generation, storage, collection, transportation, processing, and disposal in accordance with the best principles of public health, economics, engineering, conservation, aesthetics, and other environmental considerations, as well as public perceptions.

Waste characterization. The identification of constituent materials that comprise solid waste generated and disposed of in a specific area. It categorizes constituent materials by volume, weight percentage or volumetric equivalent, material type, and generation source, which includes residential, commercial, industrial, and institutional applications.

Executive Summary

This study mapped the sources and concentration of plastic waste in the Imus River watershed, which lies in the Philippine province of Cavite. It aimed to identify different origin points for plastic waste, and determine the magnitude of plastic waste generation within the watershed.

Data relating to plastic waste generation was obtained by analyzing the 10-year Solid Waste Management (SWM) plans of the seven cities and municipalities located within the boundaries of the river watershed: Tagaytay, Silang, Amadeo, Dasmariñas, Imus, Bacoor, and Kawit.

Remote sensing technology was used to identify the coordinates of different potential point sources. Google Imagery was used to prepare base maps which were imported and georeferenced in ArcMap.

A seven-day waste characterization study in three selected barangays was conducted to determine the average amount of plastic waste generated per household.

The study covered 222 barangays situated within the watershed, hosting a population of 1,351,057 people. The major source of waste production was households, followed by commercial, institutional, and industrial establishments. A total of 778 commercial, institutional, and industrial establishments were identified, while 54 waste storage facilities were found within the watershed.

An average of 0.17 Kg/day per household of plastics were generated in the watershed, or 0.05 Kg/day per capita. An intensified clustering of high plastic waste generating barangays was identified in Dasmariñas. Various tributaries of the Imus River converge in the area, meaning it is likely an important zone for plastic waste leakage into the river system.

A clustering of low plastic waste generating barangays was identified in parts of Imus, Kawit, and Bacoor. These coldspots should not be ignored, as increasing plastic waste generation in this area could rapidly transform this region into a hotspot, due to its intensified population clustering.

Introduction

Plastics are a ubiquitous material, being low cost, light weight, durable, and able to be molded into a variety of products (Andrary & Neal, 2009; van Emmerik & Schwarz, 2020). Much of these plastics are intended to be single-use. Single-use plastic is commonly used for packaging, agricultural films, and disposable consumer items (Hopewell *et al*., 2009). The use of plastics has increased to the extent that controlling subsequent environmental pollution has received enormous global attention (Argamino & Janairo, 2016; Blettler *et al*., 2019; Faure *et al*., 2015). Most plastic ends up as waste, which when mismanaged leads to plastic pollution. It has been estimated that around eight million metric tons of plastic waste enters the ocean each year (Jambeck *et al.,* 2015). Much of this pollution comes from land-based sources, especially via rivers (Andrary, 2011; Ivar do Sul & Costa, 2013; Rech *et al*., 2014). Several studies also explore the abundance and distribution of plastics in riverine ecosystems (Blettler *et al*., 2019; Fok & Cheung, 2015; Lechner *et al*., 2014; Moore *et al*., 2011). Large sources of such plastics include fisheries and local residents along the river basin (Ivar do Sul & Costa, 2013). In a recent study by Blettler *et al*. (2019), large amounts of microplastic debris in rivers were found to originate from domestic sources. There were mostly bags, foam plastics, and beverage bottles. The direct dumping of plastic wastes into the river is the main source of plastic pollution in the findings of Mihai (2018) and Kiessling *et al.* (2018). Plastic pollution has resulted in entanglement and ingestion of plastic litter by aquatic species (Redondo-Hasselerharm *et al*., 2018; van Sebille & Hardesty, 2015). Furthermore, plastic debris that accumulates on riverbanks can affect tourism and real estate value (Lebreton *et al*., 2018).

The Philippines was ranked third among the countries which contribute to plastic waste release into the ocean in 2010, after China and Indonesia (Jambeck *et al*., 2015). The country was estimated to release 0.28-0.75 million metric tons of plastics per year (Jambeck *et al.*, 2015). Despite this, there however remains a limited number of published studies on environmental plastic contamination in the Philippines (Abreo,

2015; Paler *et al*., 2019). This scarcity of data hinders a clearer understanding of the nature and extent of plastic pollution in the country.

The Province of Cavite is the most populous province in the country and is situated in Luzon as one of the provinces in the CALABARZON region[1] (Figure 1). It ranks first among the CALABARZON provinces in terms of waste generation at 0.385 kg per capita or 1,514.76 tons per day in 2018 (EMB-CALABARZON, 2018). Most of the reported wastes were classified as biodegradable (44.65%), followed by residual (31.09%) and recyclables (22.6%). Based on the Waste Analysis and Characterization Study (WACS) prepared by the municipalities and cities of Cavite, it is projected that the province will generate more waste: 1,787.79 tons per day by 2023 (EMB-CALABARZON, 2018).

The Imus River Watershed (IRW) is one of six major river systems found in Cavite. Originating in Tagaytay City, the Imus River system traverses the municipalities of Amadeo and Silang in the uplands down to the highly populated and urbanized Cities of Dasmarinas, Imus, and Bacoor, and the coastal municipality of Kawit in the lowlands before draining into Bacoor Bay. According to the partial solid waste management survey of waste generation in Cavite (PG-ENRO Solid Waste Management Division as cited by PEMSEA and Provincial Government of Cavite, 2017), the top three cities with the highest amount of waste generated in 2012 are Bacoor (260 tons/day), Dasmariñas (250 tons/day), and Imus (130 tons/day). As such, the Imus River is a candidate for conveying waste, including plastics from domestic, commercial, industrial and agricultural sources, into Manila Bay.

Imus River was selected as the local study site of the ASEANO project. The ASEANO project is a project led by the Norwegian Institute for Water Research (NIVA) and financed by the *Norwegian Development Assistance Program Against Marine Litter and Microplastics*. The aim of the ASEANO project is to strengthen knowledge, capacity, and awareness to deal with plastic pollution in the ASEAN region. This study aims to contribute to such knowledge by identifying likely sources and magnitude of plastic waste leakage in the Imus River Watershed.

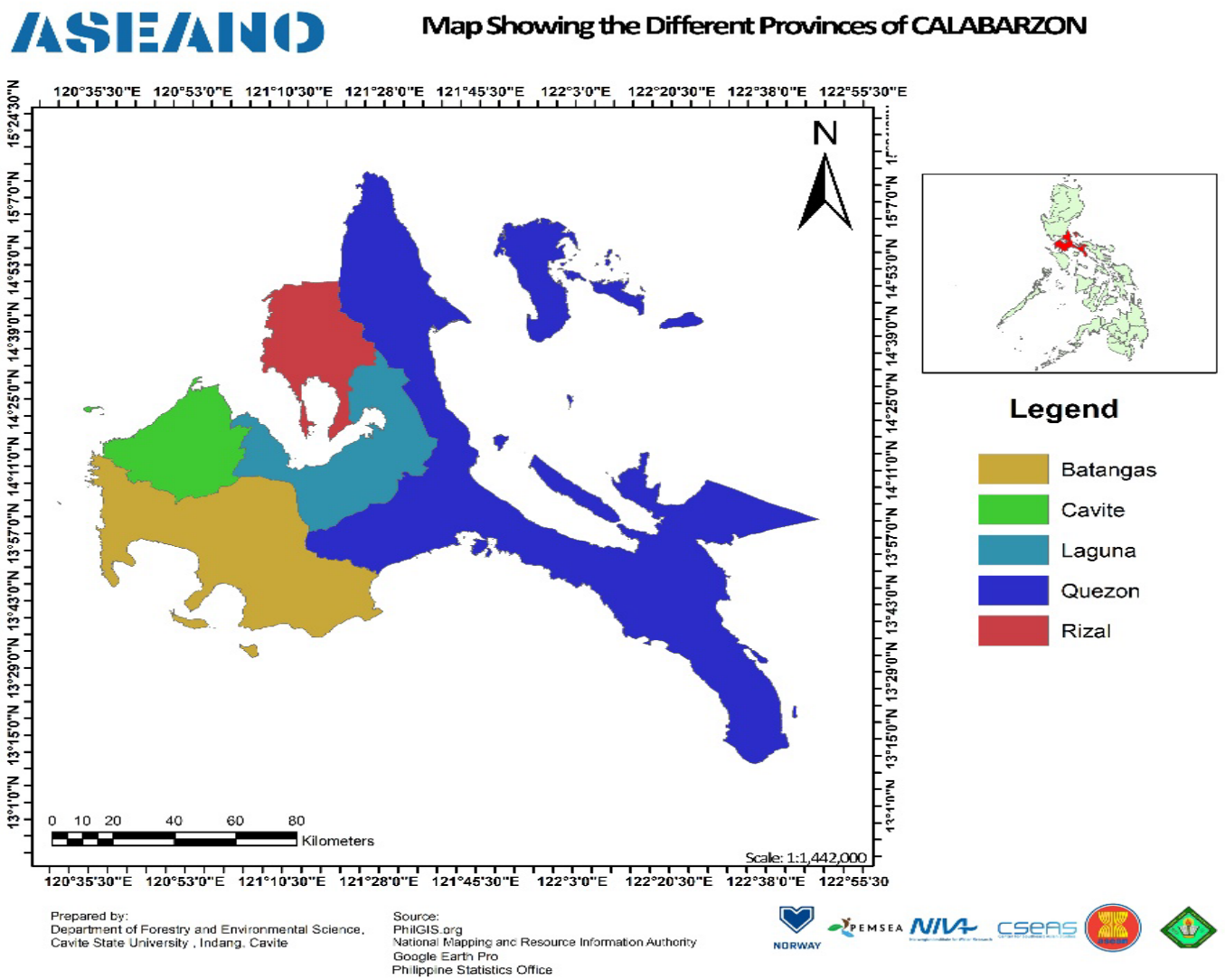


Figure 1. The provinces of CALABARZON, with Cavite in Green.

Objectives of the Study

This study aimed to identify sources of plastic waste within the Imus River Watershed and determine the magnitude of plastic waste generation from these sources.

Specifically, the study aimed to:

1. identify the different sources of plastic waste within the boundaries of the watershed;
2. map the different sources of plastic waste;
3. classify the establishments within the watershed;
4. identify the waste storage facilities within the watershed;
5. determine the magnitude of plastic waste within the watershed in terms of volume and weight; and
6. perform a hotspot analysis of plastic waste generation across the watershed.

Methodology

Mapping of Imus River Watershed and the Communities Located within Its Boundaries

The physical boundaries of Imus River Watershed were mapped in order to establish the areas that were included in the study. The cities and municipalities traversed by Imus River were identified and the barangay communities that were located inside the watershed in each city or municipality were mapped using political boundaries. The population and population density of each barangay community was determined.

Identification of Potential Sources of Plastic Wastes

Waste generation within Imus River Watershed in general was obtained from the 10-Year Solid Waste Management Plan of the cities and municipalities traversed by Imus River Watershed. Based on this plan, the sources of wastes were identified and categorized into residential, commercial, institutional, and industrial sources. Table 1 shows the different sources of wastes per sector and the description of each source.

Table 1. Different sources of wastes per sector.

Sector	Definition	Sub-sector
Residential	Households of single-family houses or multi-family buildings including sari-sari stores	Urban Rural
Commercial	Establishments engaged in business activities and operating for profits.	Public markets Private markets Major shopping malls General stores (convenience stores)) Food establishments Hotels
Institutional	Established organization serving needs of the community.	Government offices Educational institutions Medical institutions Churches
Industrial	Firms that are involved in production of goods and services.	Manufacturing Industries

Mapping of the Different Sources of Wastes including Plastics

In the absence of latitudinal and longitudinal coordinates of residences and the different commercial, industrial and institutional establishments, remote sensing technology was used to determine their coordinates and map the different sources of waste in the watershed.

Barangay communities located inside the boundaries of the watershed were identified and mapped based on political boundaries. The number of households per barangay community, total population by barangay, and population density were determined.

A list of all commercial, industrial and institutional establishments and their location were obtained from the provincial government. Their coordinates were obtained from Google Earth. These were then validated in the field by gathering precise geographical locations using the Global Positioning System (GPS). Geographic coordinates were collated using Microsoft Excel software.

To achieve higher resolutions, Google Earth satellite imagery was used to prepare base maps which were imported and georeferenced in ArcMap. Subsequently, the excel file which includes the coordinates was added to the ArcMap to generate the map of different sources of plastic waste categorized by sector.

The identified commercial and industrial establishments were further categorized as micro, small, medium and large enterprises based on the number of employees (DTI, 2019; Pech & Vrchota, 2020) as follows:

Micro enterprises : 1 - 9 employees

Small enterprises : 10 - 49 employees

Medium enterprises : 50 - 249 employees

Large enterprises : 250 employees and above

Waste Storage Facilities within the Imus River Watershed

Waste storage facilities located inside the watershed were identified, located and mapped. These include Material Recovery Receptacles (MRRs), Material Recovery Facilities (MRFs), and Sanitary Landfills (SLFs). The lists of MRRs, MRFs, and SLFs for each city or municipality were obtained from their respective City Environment and Natural Resources Offices (CENROs) and Municipal Environment and Natural Resources Offices (MENROs).

Determining the Magnitude of Waste Generation within the Watershed

The total amount of waste generated per sector for a specific period of time was also obtained from the 10-year Solid Waste Management Plans of the cities and municipalities located within the Imus River Watershed. These include all types of wastes such as biodegradables, recyclables, special wastes, and residuals (sando bags, thin films, composite, polypropylene, metallic foils, others).

Determining Plastic Wastes Generated per Household

In the absence of specific data on the amount of plastic waste generated by households, a seven-day waste characterization study at the household level was conducted to determine the average amount of plastic waste generated by the households. The study was conducted after all the barangay communities located inside the watershed were identified and mapped. Three barangay communities representing the communities in lowland areas, central hilly areas, and upland areas of the watershed were identified and selected based on their proximity to the Imus river (Figures 2-4).

The estimated number of households within the Imus River Watershed was determined, and the population estimated using the average size of household in Cavite: 4.1. From the number of households, the sample size was obtained using Cochran Equation.

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

n_0 is the sample size;

Z^2 is the abscissa of the normal curve that cuts off an area $\propto$ at the tails

($1 - \propto$ equals the desired confidence level);

e is the desired level of precision;

p is the estimated proportion of an attribute that is present in the population; and

The value of Z is found using statistical tables which contain the area under the curve. The samples were randomly picked from three pre-identified barangays with close proximity to the river.

The following formula were used to obtain the plastic generation per household and per capita:

$$APG_{HH}\left(\frac{kg}{day}\right) = \frac{\sum DPP}{N}$$

$$APG_{PC}\left(\frac{kg}{day}\right) = \frac{APG_{HH}}{4.1}$$

Where:

APG_{HH}	is the average plastic generation per household;
DPP	is the daily plastic production;
N	number of households;
APG_{PC}	is the average plastic generation per capita; and
4.1	is the average household size in Cavite.

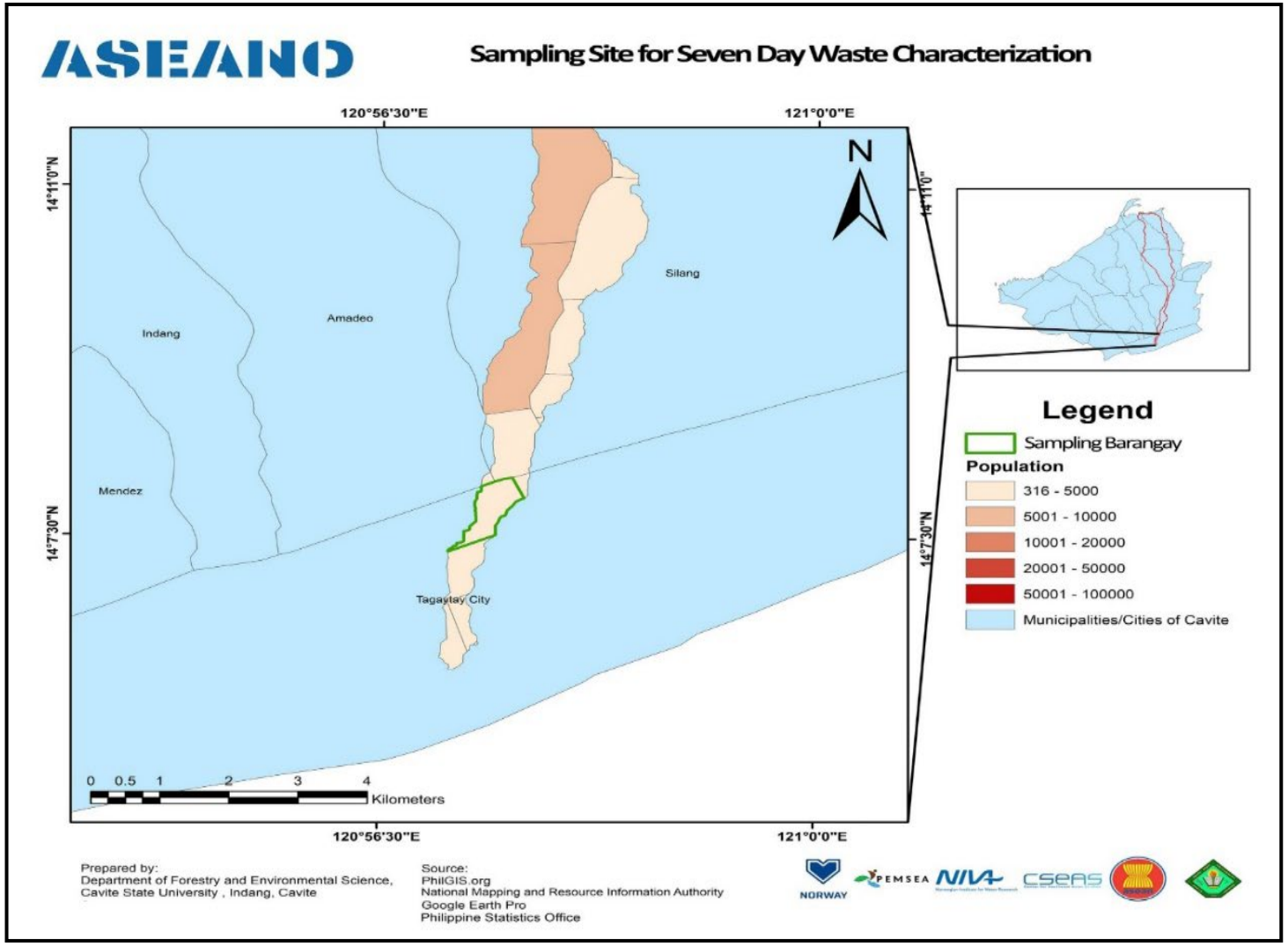


Figure 2. Sampling site for the 7-day waste characterization study: Brgy. Maitim 2nd Central, Tagaytay City.

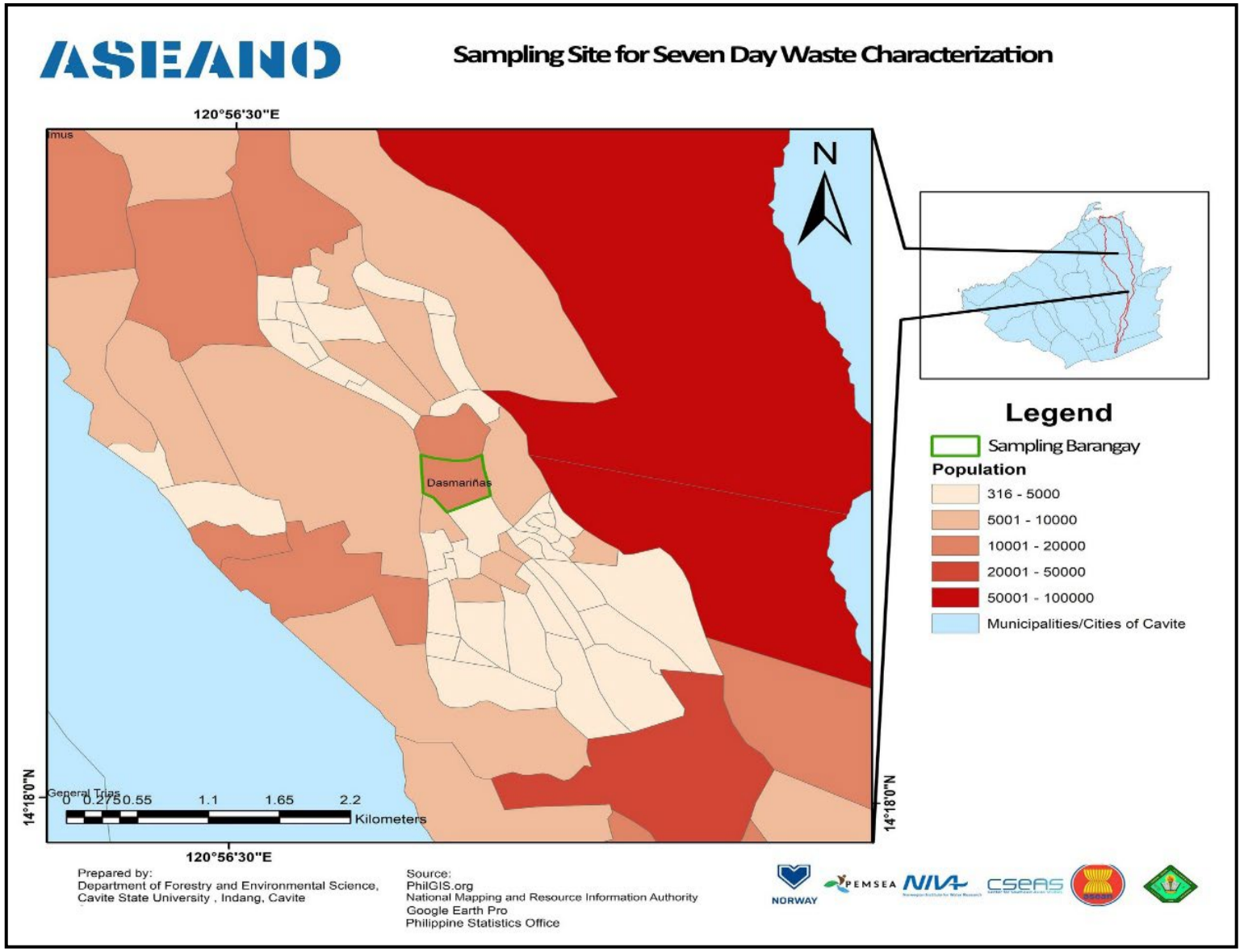


Figure 3. Sampling site for the 7-day waste characterization study: Brgy. Burol 1, Dasmariñas City.

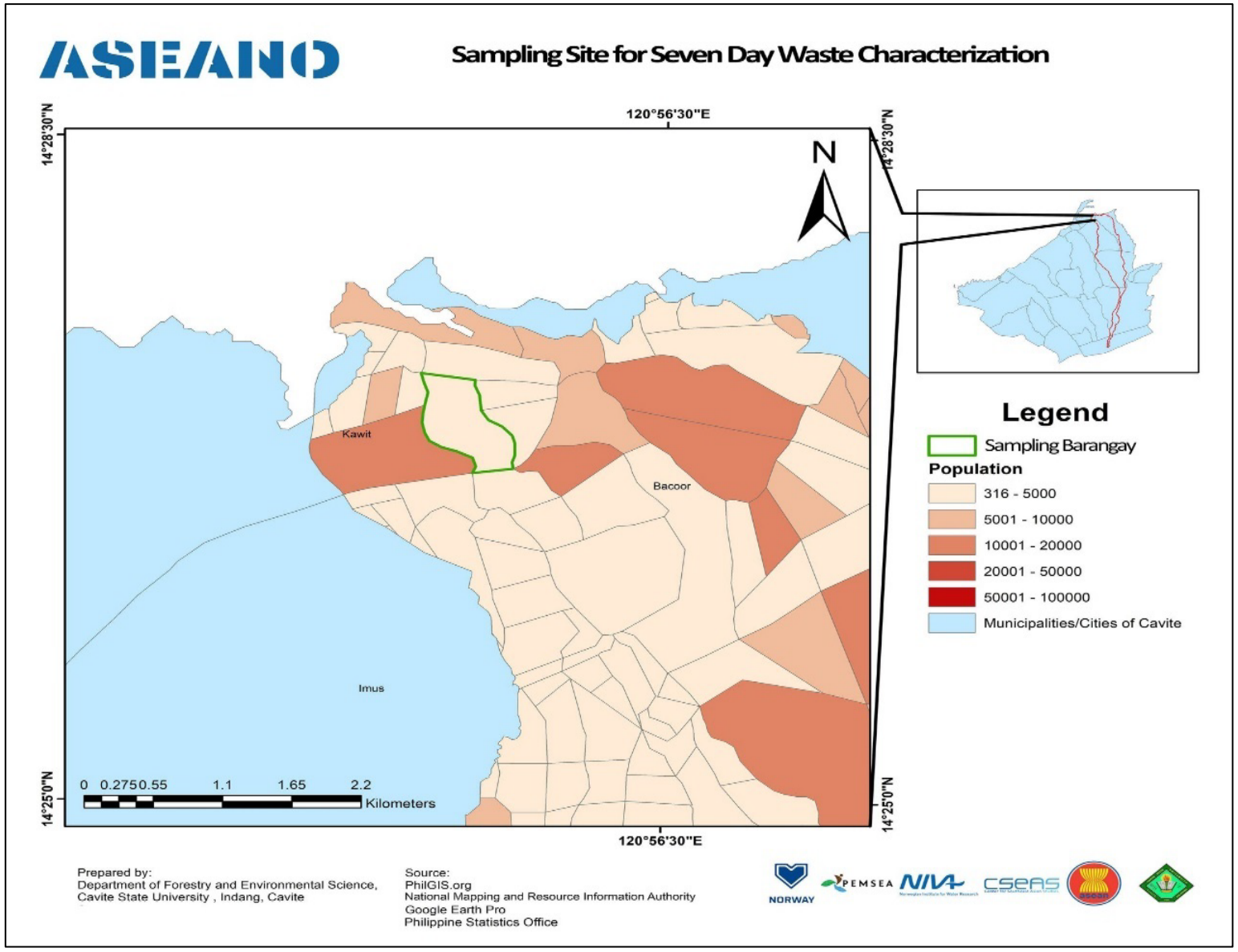


Figure 4. Sampling site for the 7-day waste characterization study: Brgy. Mabolo 1, Bacoor City.

Hotspot Analysis of Plastic Waste Generation

Hotspot analysis was conducted to determine the spatial clustering of barangays that produced high volumes of waste, and taking into consideration the distance to the Imus River. Major processes involved in the estimation of plastic waste hotspots were the collection of data, mapping of clusters using Getis-Ord Gi*, and the estimation of density using the Kernel Density Tool. All spatial processing was carried out in ArcGIS. The mapping of clusters was examined using the spatial statistic hot spot analysis tool from ArcGIS, which uses the Getis-Ord Gi* algorithm. The Getis-Ord local statistic was computed as (ESRI, 2020):

$$Gi^* = \frac{\sum_{j=1}^{n} W_{i,j}X_j - \bar{X}\sum_{j=1}^{n} W_{i,j}}{S\sqrt{\frac{\left[n\sum_{j=1}^{n} w_{i,j}^{2} - \left(\sum_{j=1}^{n} W_{i,j}\right)\text{^}2\right]}{n-1}}}$$

Where:

Gi^* statistics is the Z score;

x_j is the plastic production (kg/day) per barangay *j;*

$W_{i,j}$ is the spatial weight vector between barangay boundaries *i* and *j*; and

n is the total number of barangay communities.

The plastic production (kg/day) in each barangay (x_j) was obtained by multiplying the population of each barangay with the established average per capita plastic production found through the 7-day characterization study. For the barangays that are partially covered by the IRW, the population within the watershed was estimated by multiplying the area covered by the IRW and the barangay's population density before multiplying this with the average per capita plastic production.

For barangays entirely covered by the IRW:

$$x_j = Popn\ x\ APG_{PC}$$

For barangays partially covered by the IRW:

$$x_j = (PopnD\ x\ A_c) x\ APG_{PC}$$

Where:

x_j	plastic production (kg/day) per barangay;
Popn	population per barangay;
PopnD	population density per barangay; and
A_c	Area of barangay covered by the IRW.

and the mean of spatial features $\bar{X}$ was computed as follows:

$$\bar{X} = \frac{\sum_{j=1}^{n} x_j}{n}$$

and the standard deviation *S* was computed as follows:

$$S = \sqrt{\frac{\sum_{j=1}^{n} w_j^2}{n-1} - (\bar{X})\text{^}2}$$

For statistically significant positive Z scores, the higher the Z score, the higher the clustering of hot spots (indicating a high volume of waste generated). While for statistically significant negative Z scores, the lower the Z score, the higher the clustering of cold spots (low volume of waste generated) (ESRI, 2020).

Kernel density hotspots with populated fields were also conducted using the point density calculator function in the ArcGIS spatial analyst tool. The magnitude per unit area from each hotspot showing the areas with high and low clusters of plastic waste generation was determined.

The average amount of plastic per capita obtained from the 7-day waste characterization study was used to estimate the amount of plastic generated per barangay. These served as the input data for the hotspot analysis in ArcGIS.

Results and Discussion

Map of the Imus River Watershed

The Imus River Watershed is one of six major river watersheds in the province of Cavite. It originates in Tagaytay City, in the uplands, and drains into Bacoor Bay. The Imus river system traverses seven cities and municipalities (Table 2), encompassing parts of Tagaytay City, Silang, and Amadeo in the uplands, a large part of the densely populated and urbanized cities of Dasmariñas and Imus City in the central hilly region, and the City of Bacoor and the coastal Municipality of Kawit in the coastal lowlands (Figure 5).

Table 2. Municipalities and cities traversed by Imus River Watershed.

Municipality/City	Area (ha)	Share of watershed (%)
Amadeo	4.09	0.03
Bacoor	1,880.31	16.70
Dasmariñas	4,830.42	42.92
Imus	2,993.66	26.60
Kawit	137.74	1.21
Silang	1,263.36	11.22
Tagaytay	150.19	1.32
Total	**11,259.80**	**100**

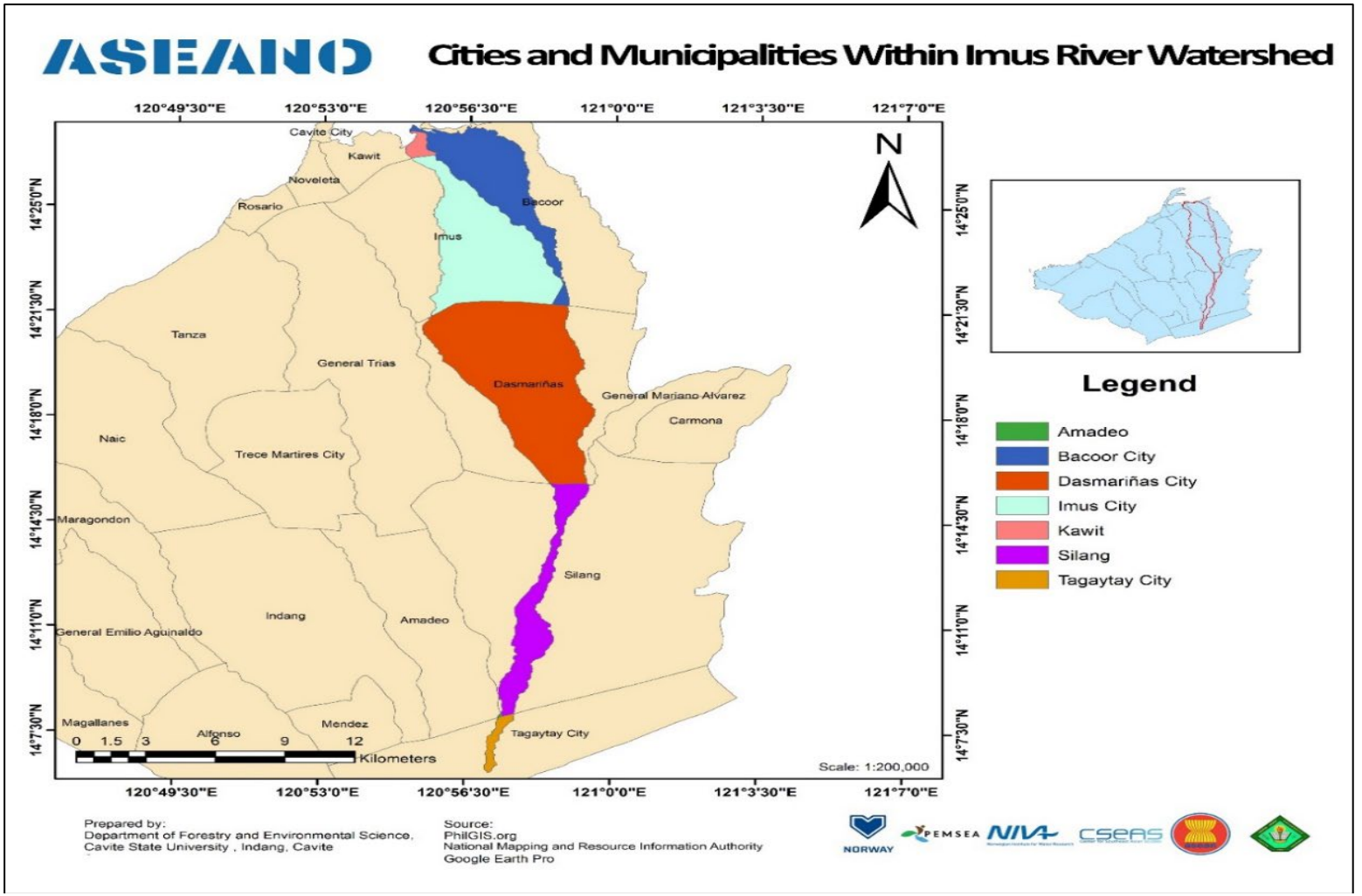


Figure 5. The seven cities and municipalities that encompass parts of the Imus River Watershed.

Barangay Communities Located within Imus River Watershed

A total of 222 barangay communities lie within the boundaries of the watershed (Table 3, Figures 6-12).

Table 3. List of barangay communities within the Imus River Watershed.

MUNICIPALITY/CITY	NO. OF BARANGAYS INSIDE IRW	NAME OF BARANGAY
Tagaytay City	7	Kaybagal East, Mag-Asawang Ilat, Maharlika East, Maitim 2nd Central, Maitim 2nd West, Silang Junction North, Silang Junction South
Amadeo	1	Buho
Silang	19	Balite I & II, Barangay I - IV, Biga II, Buho, Iba, Lalaan I & II, Malabag, Malaking Tatyao, Mataas Na Burol, Sabutan, San Vicente II, Toledo, Tubuan I & III
Dasmariñas City	69	Zone IV, Burol I - III, Burol, Datu Esmael, Emmanuel Bergado I & II, Fatima I - III, Luzviminda I & II, Paliparan I - III, Sabang, Saint Peter I & II, Salawag, Salitran I - IV, Sampaloc I - V, San Agustin I - III, San Andres I & II, San Antonio de Padua I & II, San Dionisio, San Esteban, San Francisco I & II, San Isidro, Labrador I & II, San Jose, San Juan, San Lorenzo Ruiz I & II, San Luis I & II, San Manuel I & II, San Mateo, San Miguel II, San Miguel, San Nicolas I & II, San Roque, San Simon, Santa Cristina I & II, Santa Cruz I & II, Santa Fe, Santa Lucia, Santa Maria, Santo Cristo, Santo Niño I & II, Zone I-B, Zone I
Imus City	73	Anabu I (A - G), Anabu II (A - F), Bagong Silang, Bayan Luma I - IX, Bucandala I, II, V, Buhay na Tubig, Carsadang Bago I, Magdalo, Maharlika, Malagasang I (F&G), Malagasang II (E, F, G), Mariano Espeleta I - III, Medicion I (C&D), Medicion II (C - F), Palico I - III & V, Pasong Buaya I & II, Pinagbuklod, Poblacion I (A - C), Poblacion II (A & B), Poblacion III (A & B), Poblacion IV (A - D), Tanzang Luma I - IV, Toclong I (A - C), Toclong II (A&B)
Bacoor City	48	Alima, Aniban I, Banalo, Bayanan, Campo Santo, Daang Bukid, Digman, Dulong Bayan, Habay I & II, Kaingin, Ligas III, Mabolo I - III, Maliksi I, Mambog I - V, Molino II - V & VII, Niog I & II, P.F. Espiritu I - VIII, Queens Row East, Real I & II, Salinas I - IV, Sineguelasan, Tabing Dagat
Kawit	8	Toclong, Balsahan-Bisita, Binakayan - Aplaya, Binakayan-Kanluran,Congbalay - Legaspi, Manggahan -Lawin, Pulvorista, Samala – Marquez

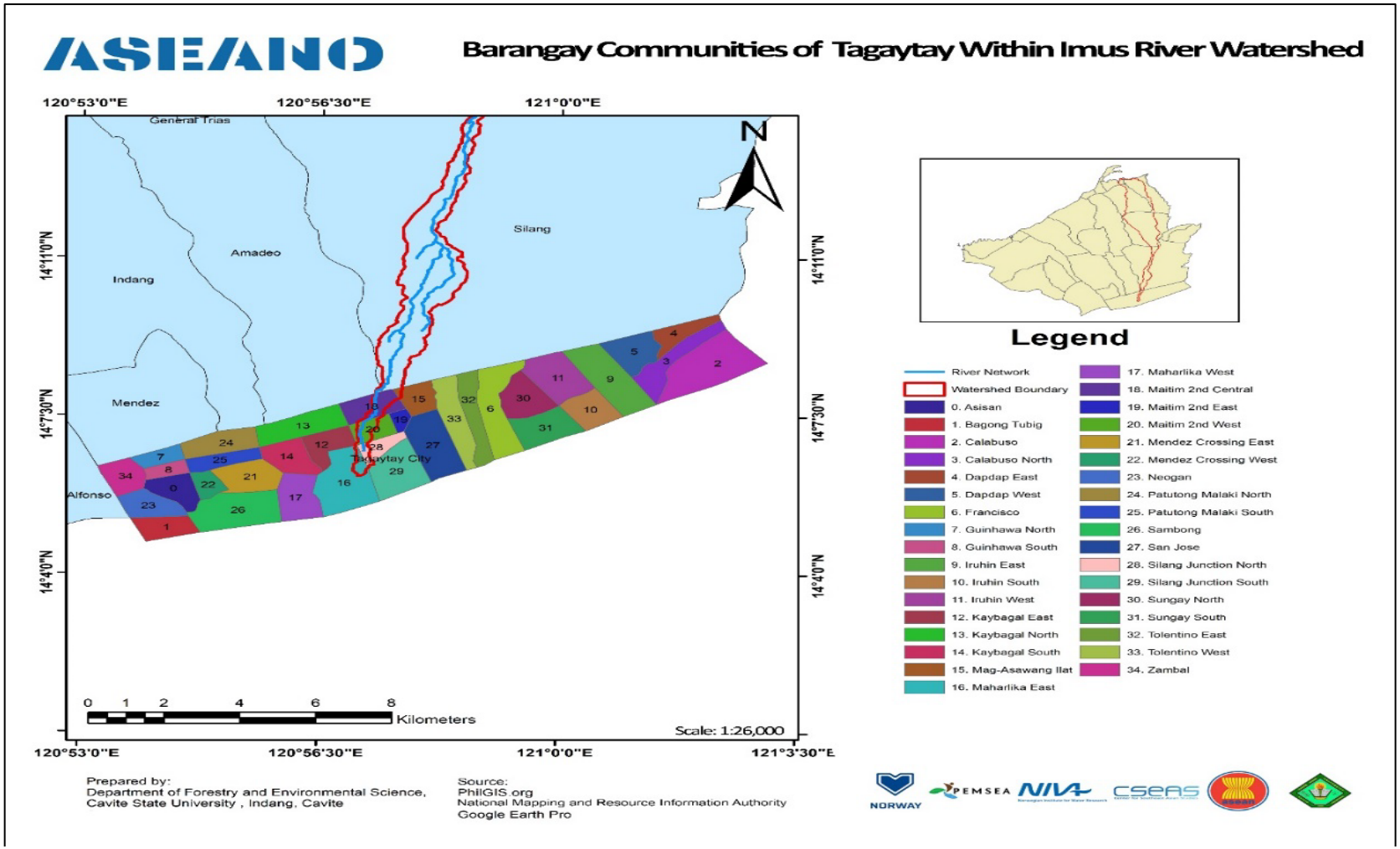


Figure 6. The barangay communities of Tagaytay City overlaid with the Imus River Watershed.

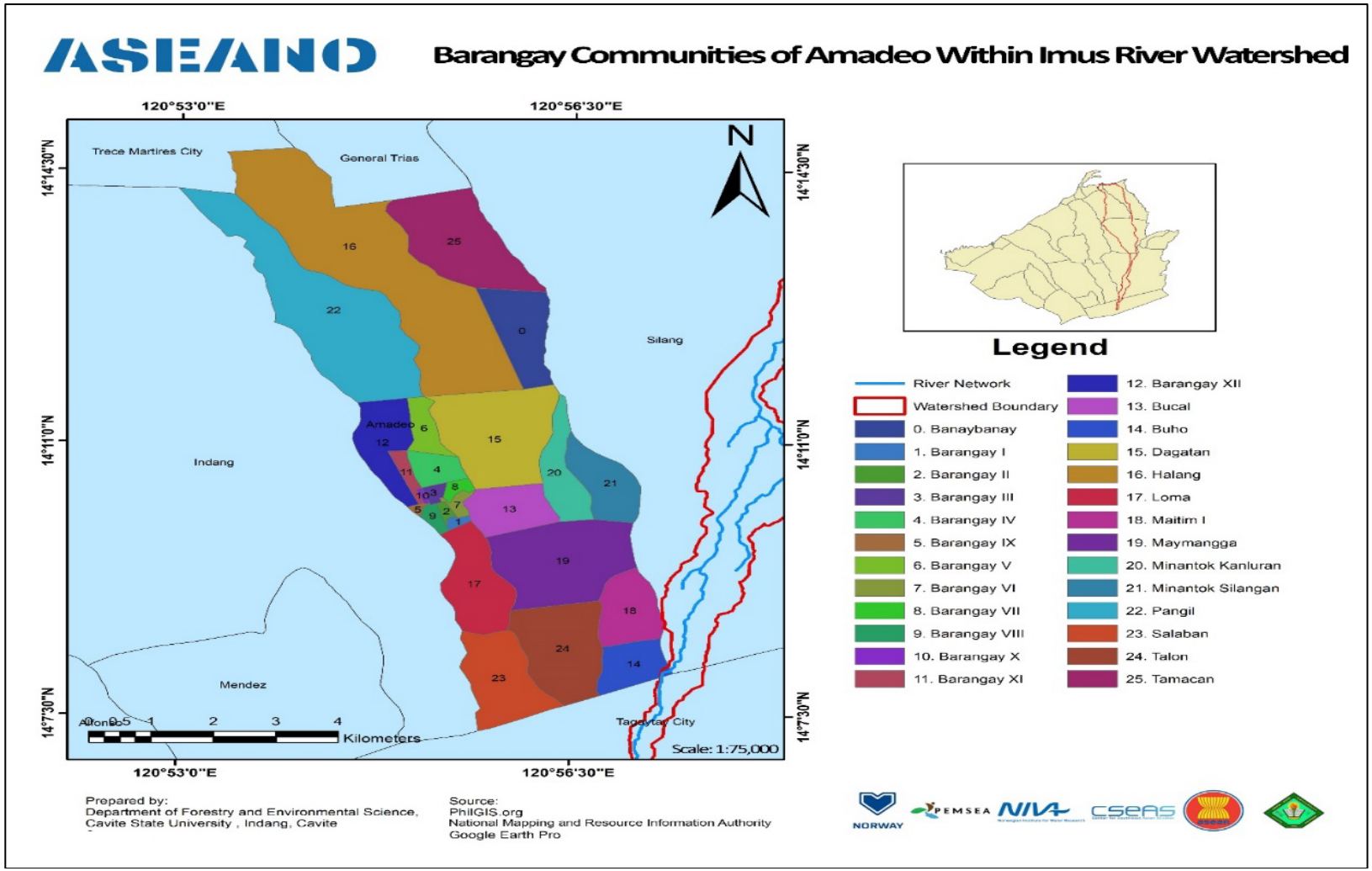


Figure 7. The barangay community of the Municipality of Amadeo overlaid with the Imus River Watershed.

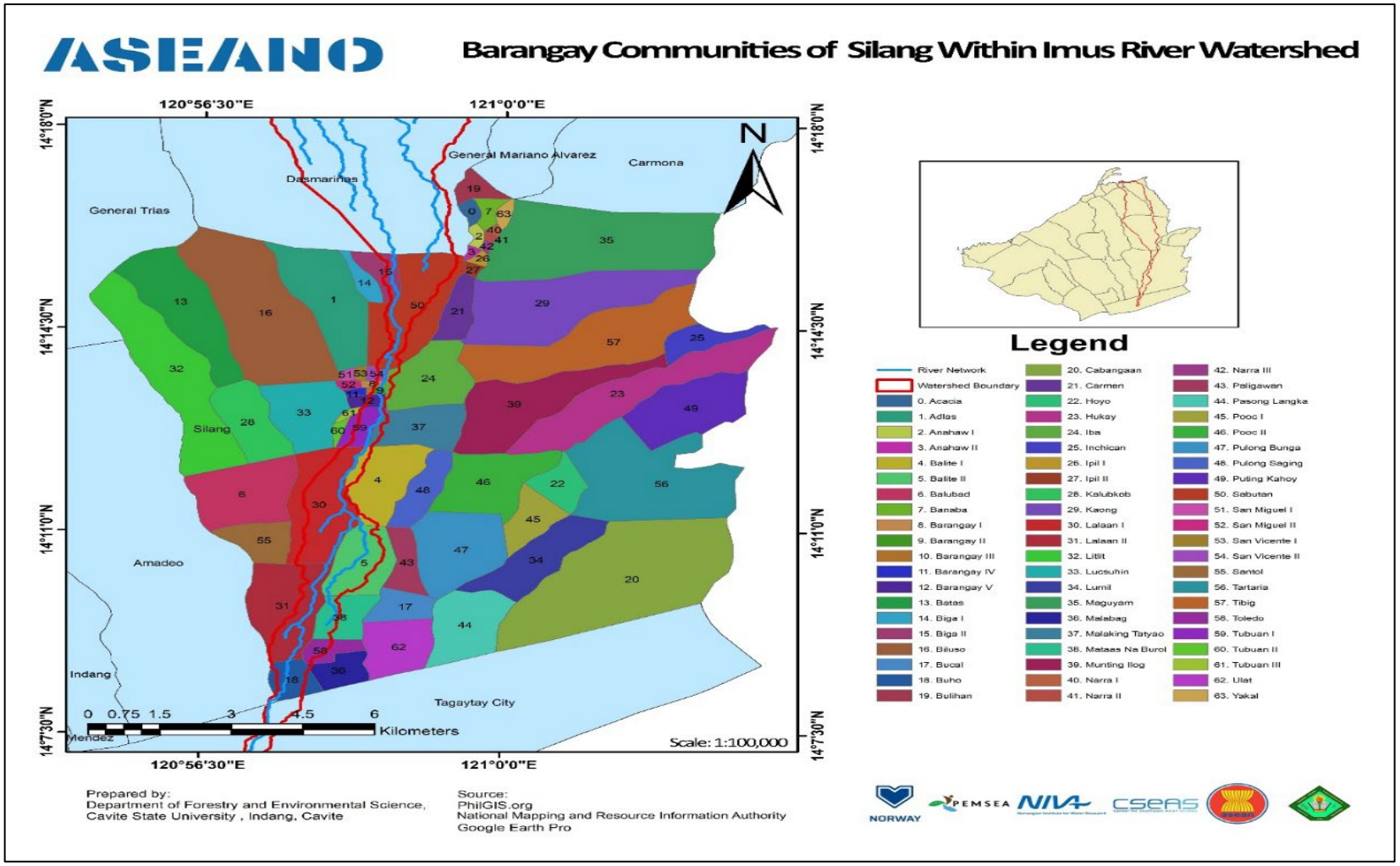


Figure 8. The barangay communities of Municipality of Silang overlaid with the boundaries of the Imus River Watershed.

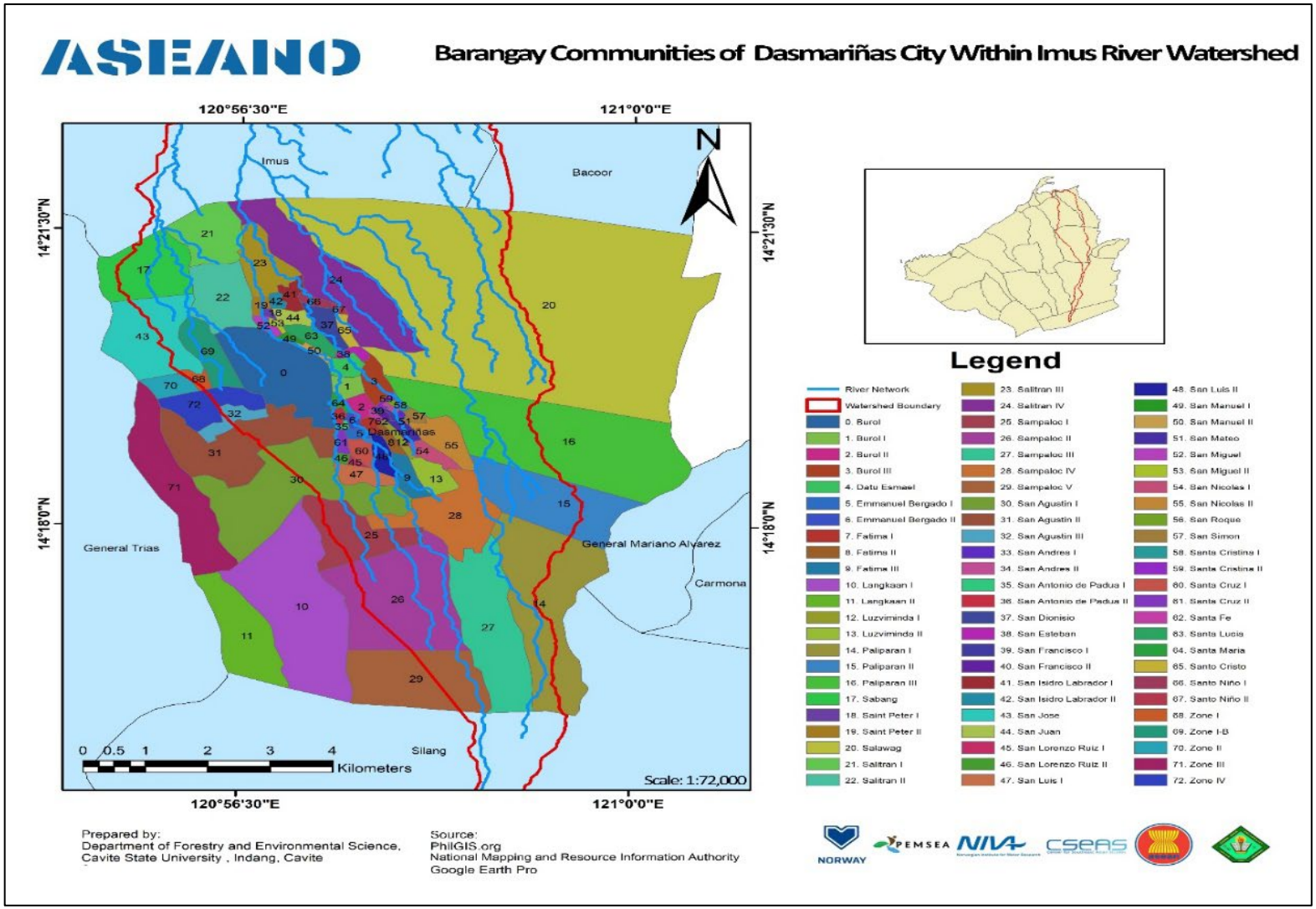


Figure 9. The barangay communities of Dasmariñas City overlaid with the boundaries of the Imus River Watershed.

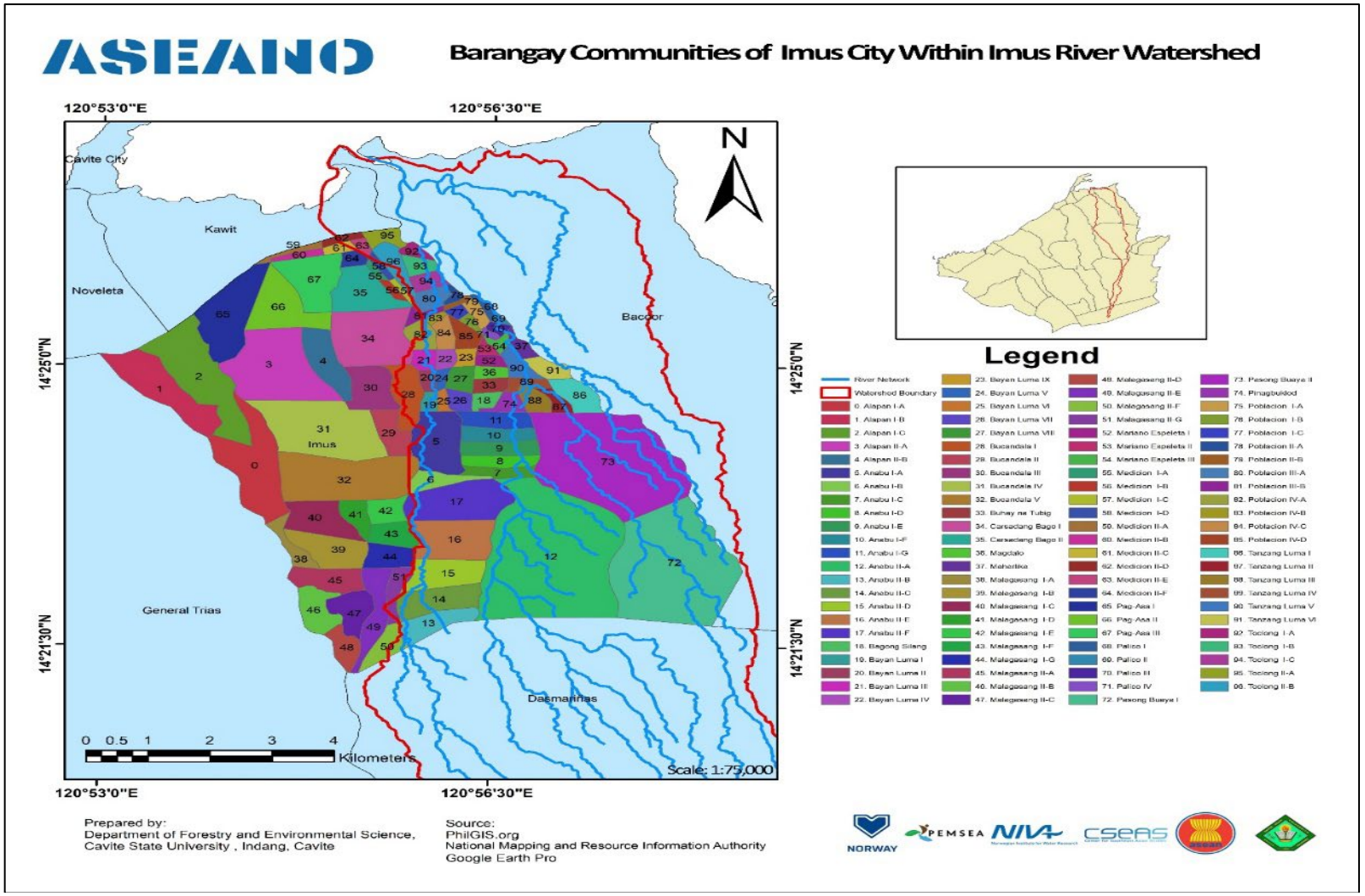


Figure 10. The barangay communities of Imus City overlaid with the boundaries of the Imus River Watershed.

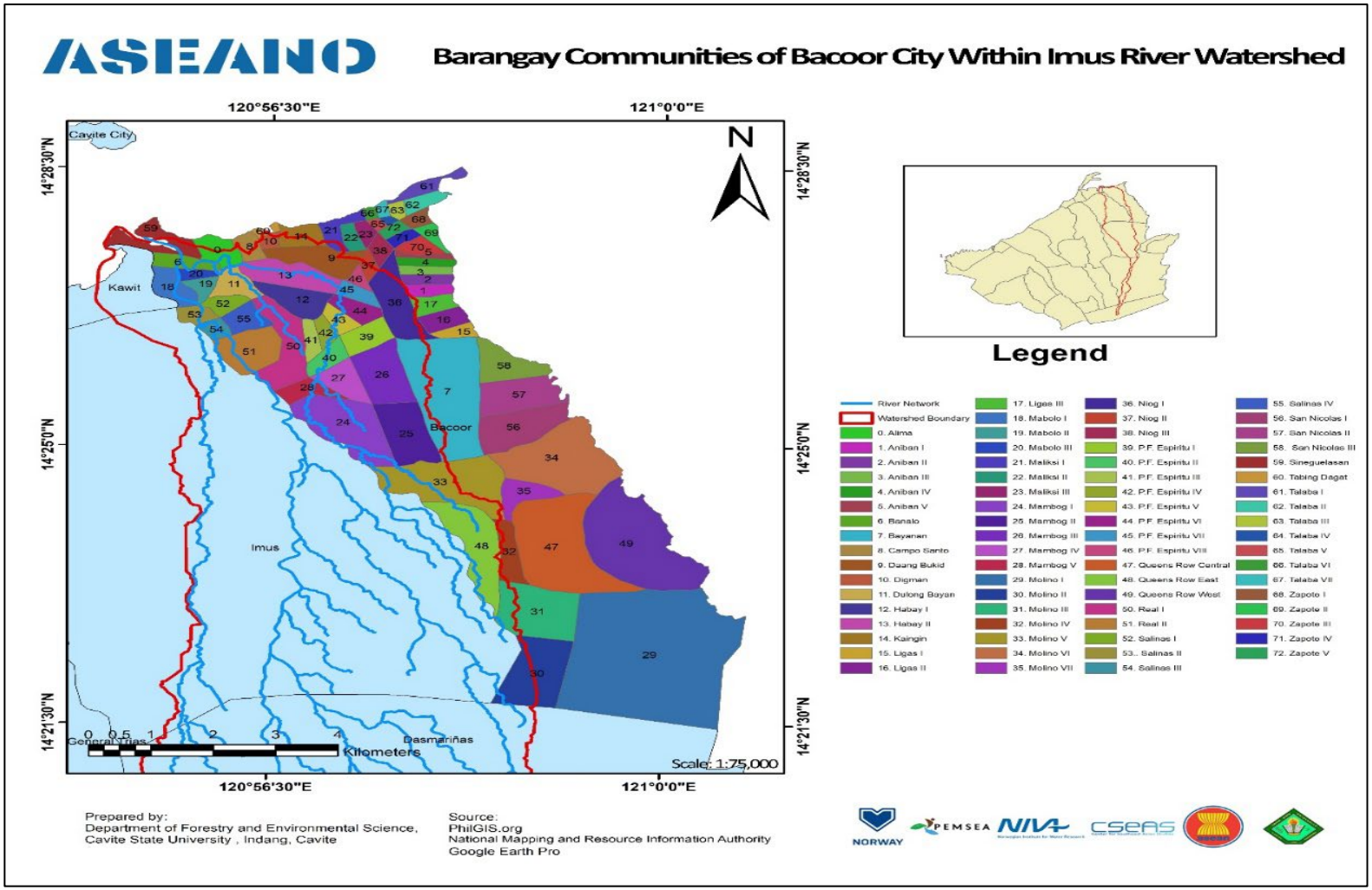


Figure 11. The barangay communities of Bacoor City overlaid with the boundaries of the Imus River Watershed.

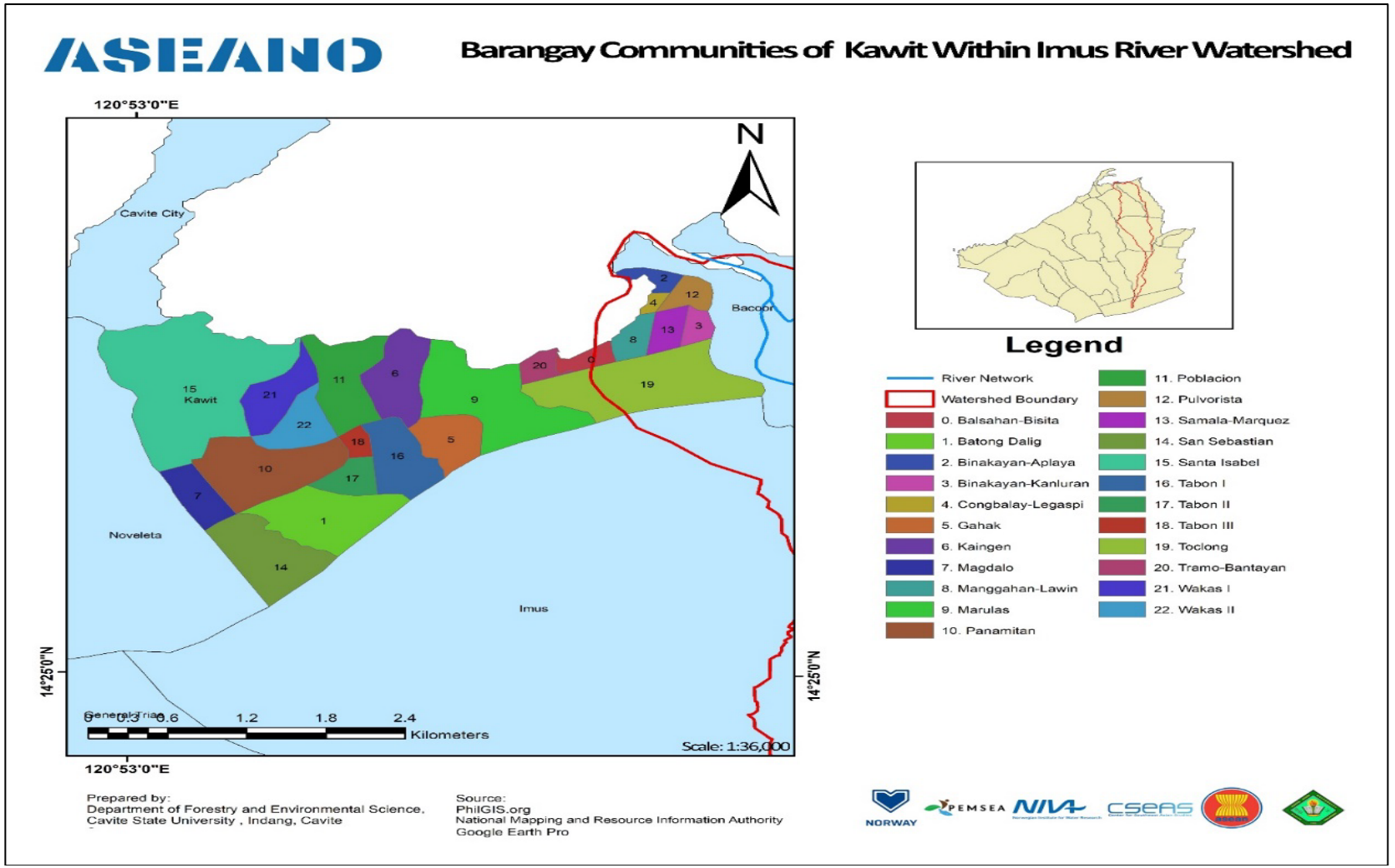


Figure 12. The barangay communities of Kawit overlaid with the boundaries of the Imus River Watershed.

Identified Sources of Wastes and Waste Generation by Sector in the Watershed

The major sources of wastes and rate of waste generation per source were obtained from the 10-Year Solid Waste Management Plan of the seven cities and municipalities traversed by Imus River Watershed. These major sources were:

1. **Households** of single-family houses or multi-family buildings that include sari-sari stores;
2. **Commercial establishments** including public markets, private markets, major shopping malls, general stores (convenience stores), food establishments, and hotels;
3. **Industrial establishments** involved in the production of goods and services such as manufacturing industries; and
4. **Institutional establishments** that serve the needs of the community such as government offices, educational institutions, medical institutions and churches.

Table 4. Percentage waste generation by municipality/city in 2015 (10-year Solid Waste Management Plan, 2015).

MUNICIPALITY/ CITY	HOUSEHOLD	COMMERCIAL	INSTITUTIONAL	INDUSTRIAL
Tagaytay	74.76	19.51	5.73	
Amadeo	94.52	4.46	1.02	
Silang	97.19	2.73	0.08	
Dasmariñas	96.58	3.03	0.39	
Imus	87.79	8.42	1.64	2.15
Bacoor	63.22	35.68	1.09	0.01
Kawit	97.73	2.16	0.11	

Households were the biggest generator of waste (producing 63 – 97.73% of the total) followed by commercial establishments (2.16 – 35.68%), institutions (0.08 – 5.73%), and industries (0.01 – 2.15%) (10-year Solid Waste Management Plan, 2015). Among the cities and municipalities covered by the study, Bacoor City had the biggest share of commercial wastes at 35% followed by Tagaytay City at 19.51% and Imus City at 8.42% (Table 4). The very low percentage of wastes recorded as originating from commercial, institutional, and industrial establishments likely reflects that these establishments often have their own collection and disposal systems serviced by private haulers, rather than being serviced by the city or municipal waste collection system.

Average Household Waste Generation and Composition

The composition of waste in the upland Tagaytay City was 42% biodegradables, followed by 32% residuals, 25% recyclables, and less than 1% for others. Amadeo produced 45% biodegradables, 28% residuals, 26% recyclables, and 1.32% others. Silang produced a relatively larger percentage of biodegradables at 59%, followed by 21% recyclables, only 19% residuals, and less than 1% other wastes (Table 5).

In the Central Hilly areas, Dasmariñas produced more residual waste (34%) than biodegradable (33%), with recyclables following at 21% and other wastes at 1.83%. Imus City had an unusually high percentage of residual wastes (47%), with biodegradables at 27%, recyclables at 25%, and others at less than 1% (Table 5).

In the lowland areas, Bacoor City produced 44% biodegradables, 34% residuals, 21% recyclables, and less than 1% for other wastes. The coastal municipality of Kawit produced 41% biodegradables, 33% residuals, 25% recyclables, and 1.09% other wastes (Table 5).

Since plastics are classified under recyclables and residuals, this data indicates a potentially significant amount of plastic waste being generated in the watershed. The central hilly areas of the watershed occupied by Dasmariñas City and Imus City leads with the percentage of residuals generated being 47% and 34%, respectively.

The largely agricultural municipalities of Silang and Amadeo had the lowest generation of residuals, at only 19% and 28%, respectively, while the more urbanized cities and the coastal municipality of Kawit produced more residuals.

The highest average household waste generation was observed in Kawit at 1.99 Kg/day, and lowest in Amadeo at 0.6 Kg/day.

Table 5. Household wastes composition by municipality/city in 2015 from the 10-year Solid Waste Management Plan of the city/municipality.

HOUSEHOLD WASTE COMPOSITION PER CITY/ MUNICIPALITY										
Municipality /City	Biodegradable		Recyclable		Residual waste for disposal		Others		Total waste (kg/day)	Average waste per household (kg/day)
	(kg/day)	%	(kg/day)	%	(kg/day)	%	(kg/day)	%		
Tagaytay	8,642.22	42	5,074.49	25	6,532.02	32	96.39	0.47	20,346	1.26
Amadeo	3545.59	45	2045.08	26	2176.96	28	104.25	1.32	7,871	0.6
Silang	67,737.60	59	24,451.57	21	21,953.21	19	500.68	0.44	114,643	1.97
Dasmarinas	40,948.86	33	38,111.29	31	41,898.31	34	2250.6	1.83	123,209	0.83
Imus	38,643.01	27	35,873.99	25	67,468.21	47	261.43	0.18	142,246	1.24
Bacoor	54,090.00	44	26,010.00	21	41,920.00	34	700	0.57	122,720	0.86
Kawit	17,189.00	41	10,349.00	25	13,739.00	33	454	1.09	41,731	1.99

Maps of Commercial, Industrial and Institutional Establishments in IRW

Aside from households, the other potential sources of plastic wastes were the commercial, institutional, and industrial establishments. 778 such establishments were identified within the watershed (Figure 13). Among the seven municipalities and cities, Bacoor City had the highest number of establishments at 276, while Amadeo had the least at 11. Dasmariñas City and Imus City had 201 and 145 establishments, respectively (Table 6).

Table 6. Distribution of the 778 potential sources of plastic wastes in Imus River Watershed by classification.

MUNICIPALITY/ CITY	COMMERCIAL	INSTITUTIONAL	INDUSTRIAL	TOTAL
Tagaytay	19	10	0	29
Amadeo	9	0	2	11
Silang	36	24	17	77
Dasmariñas	87	94	20	201
Imus	65	28	52	145
Bacoor	155	98	23	276
Kawit	27	7	5	39
TOTAL	**398**	**261**	**119**	**778**

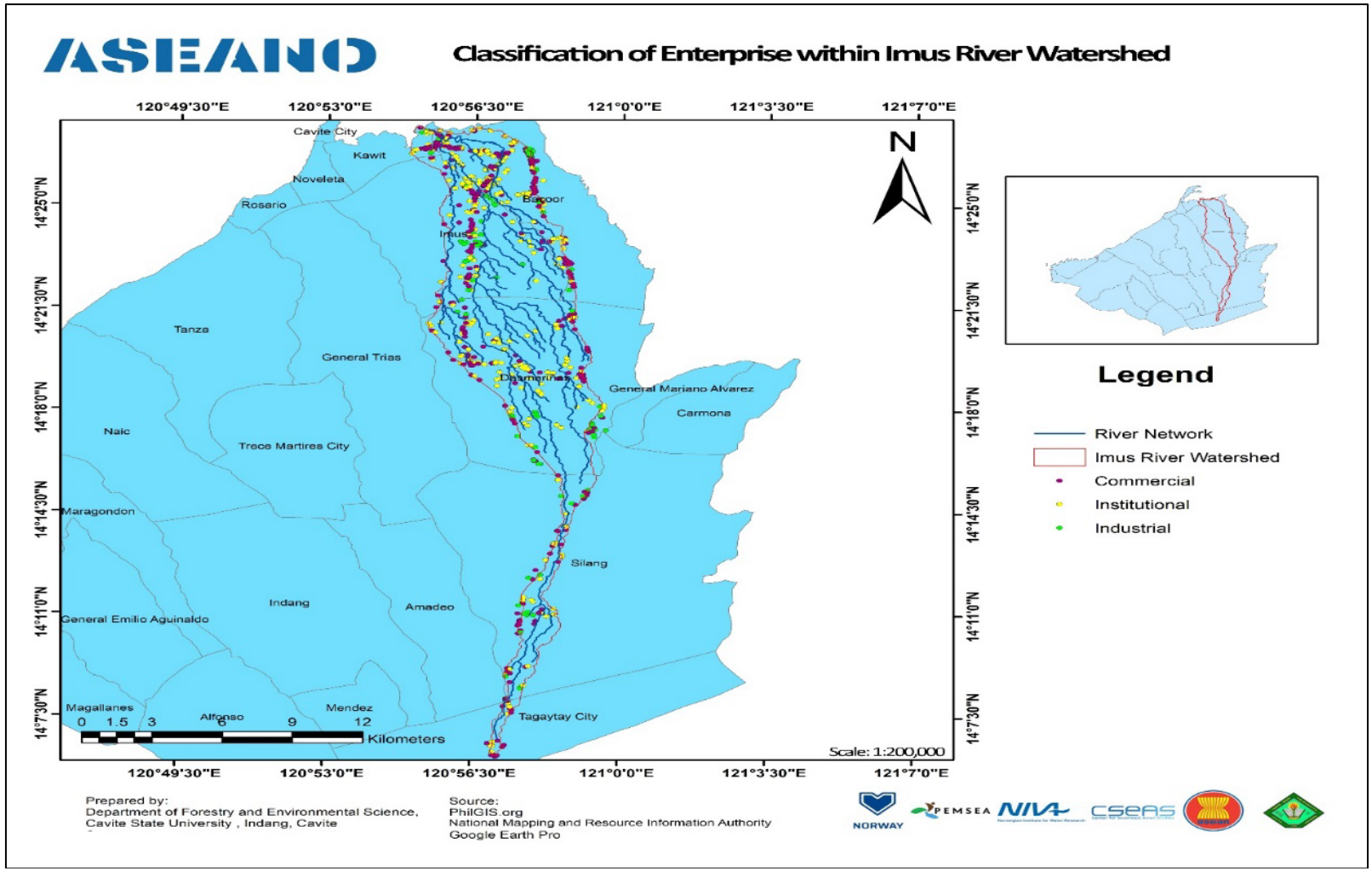


Figure 13. Distribution of 778 identified commercial, institutional, and industrial enterprises within the Imus River Watershed.

Classification of Establishments as Micro, Small, Medium, and Large Enterprises

When looking at the size of these establishments, those considered small business enterprises, larger than micro businesses but smaller than medium and large businesses, were the most common type of establishment in all cities and municipalities except for Amadeo (Table 7). The area of Amadeo within the watershed instead had mostly micro businesses.

Table 7. Number of business enterprises per municipality/city.

MUNICIPALITY/CITY	BUSINESS ENTERPRISE				
	Micro	Small	Medium	Large	TOTAL
Tagaytay	12	16	1	0	29
Amadeo	8	2	1	0	11
Silang	24	39	13	1	77
Dasmariñas	43	111	41	6	201
Imus	34	83	23	5	145
Bacoor	45	203	25	3	276
Kawit	8	27	3	1	39
TOTAL	**174**	**481**	**107**	**16**	**778**

Identification of Waste Storage Facilities

One way of managing wastes is by using waste storage facilities such as Material Recovery Receptacles (MRRs), Material Recovery Facilities (MRFs), and Sanitary Landfills (SLFs). In the Philippines this is mandated by Republic Act 9003 otherwise known the Ecological Solid Waste Management Act of 2000. RA 9003 defined MRFs as facilities which includes a solid waste transfer station or sorting station, a drop-off center, a composting facility, and a recycling facility. MRRs are defined as individual containers used to separate and collect recycled materials, while SLFs are defined as waste disposal facilities. Waste collection sees the collection of waste materials from every house within a target area. From this waste, recyclables are offered to junkshops, and biodegradables either for use as animal feed or for fertilizing the soil and block or community which makes use of MRFs in barangays that are within or close to the designated collection region. Different programs, projects, and actions are implemented by all cities and municipalities of Cavite (Appendix Table 22) to comply with the provisions of RA 9003 (Esplana, 2019).

Of the 54 waste storage facilities within the watershed, 21 of these are located in Bacoor City and 10 each in Dasmariñas City and Silang (Table 8). All of the seven municipalities and cities have MRFs following the Implementing Rules and Regulation (IRR) of RA 9003 which states that "*MRFs will be established in every barangay or cluster of barangays"*. Only Silang, Dasmariñas City, Bacoor City, and Kawit have MRRs. Municipalities and cities that have Sanitary Landfills include Silang and Dasmariñas City. Among the three waste storage facilities, 35 are MRRs, 17 are MRFs and only two are SLFs.

Table 8. Waste storage facilities in the Imus River Watershed.

MUNICIPALITY/CITY	WASTE STORAGE FACILITY			
	MRR	MRF	Sanitary Landfill	TOTAL
Tagaytay	0	2	0	2
Amadeo	0	1	0	1
Silang	7	2	1	10
Dasmariñas	8	1	1	10
Imus	0	3	0	3
Bacoor	14	7	0	21
Kawit	6	1	0	7
TOTAL	**35**	**17**	**2**	**54**

For the city of Tagaytay, the two MRFs are located in Brgy. Silang Crossing West and Brgy. Silang Junction North (Figure 14). Residual waste is hauled and disposed of through an accredited landfill located in Barangay San Antonio, San Pedro, Laguna. Moreover, special waste is collected by barangays with MRFs and then collected by the city for proper disposal.

The Municipality of Amadeo has one MRF located in Brgy. Buho (Figure 14). Residual waste is collected and disposed of through the accredited landfill located in Barangay San Antonio, San Pedro, Laguna, while recyclable waste is stored in MRFs. Moreover, biodegradable waste is disposed of in compost pits in backyards or at community composting sites.

For Silang, the two MRFs, seven MRRs and one SLF are located in Brgy. Lalaan I with a total area of 2.2 hectares (Figure 14). Collected waste is disposed of in Suri Sanitary Landfill, located in Brgy. Bubuyan, Calamba City, Laguna. Special waste is

brought to Cleanway Environmental Management Solutions in Silang, Cavite for treatment and final disposal.

Dasmariñas City, on the other hand, has one MRF, eight MRRs, and one SLF (Figure 14). The MRF, with an area of 0.1 hectare, is located in Brgy. Luzviminda II. Non-toxic waste from the city is disposed of in a six-hectare private property in Brgy. Salawag.

Imus City has three MRFs and one Waste Ecology Center (Figure 14). Residual waste is disposed of in Suri Sanitary Landfill, in Brgy. Bubuyan, Calamba City, Laguna.

Bacoor City has the highest number of waste storage facilities with seven MRFs and 14 MRRs (Figure 14). Like in Imus City and Silang, residual waste is disposed of in Suri Sanitary Landfill.

For the municipality of Kawit, one MRF is located in Brgy. Binakayan-Aplaya and six MRRs are located in the municipality (Figure 14). Residual waste is also disposed of in Suri Sanitary Landfill.

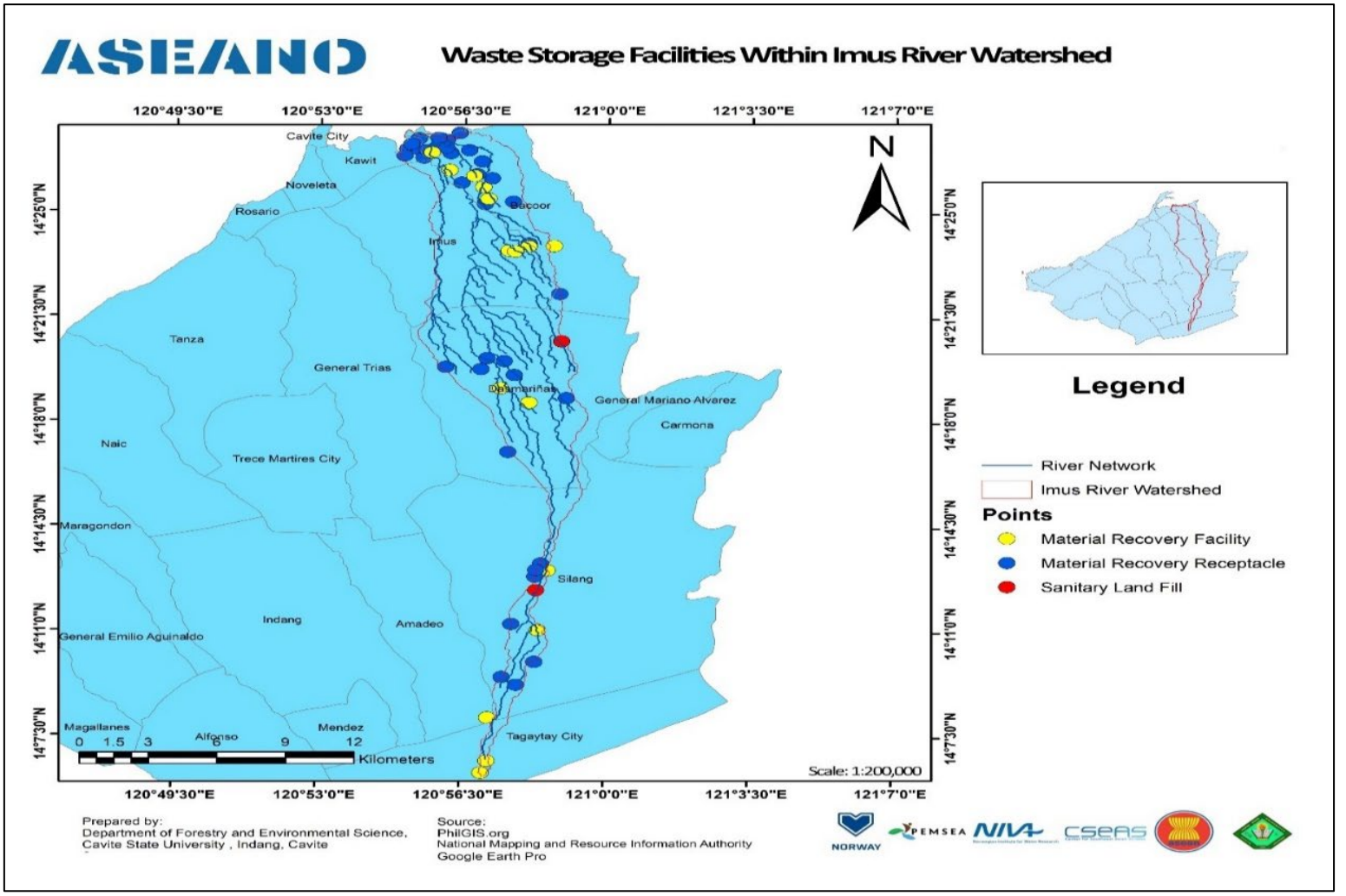


Figure 14. Location of waste storage facilities in the Imus River Watershed.

Plastic Waste Generation in Selected Barangays in Imus River Watershed

In order to determine the amount of plastic waste generated from households, a seven days characterization study was conducted in three selected barangays representing the lowland communities, central hilly communities, and the upland communities.

A total of 349 households participated in Barangay Burol 1 in Dasmarinas City. In total, 777.24 kg of plastics was obtained during the seven-day period. On average, these households generated daily plastic waste volumes of 113.03 kg/day. Among the 349 households, there were 11 food vendors, 1 food vendor with a sari-sari store, 2 online food sellers, 1 home cake baker, 11 with a sari-sari store, 2 with bakeries, 1 with a milktea shop, 1 with a general merchandise store, and 7 with canteens. There were 8 households with more than 6 members. Household #42, which has 7 household members, generated the highest total plastic waste at 16 kg, or an average of 2.29 kg/day.

In Barangay Mabolo 1, in Bacoor City, 187 participating households were surveyed. A total of 64.18 kg of plastic waste was obtained during the seven-day period, with an average daily plastic waste generation rate of 9.17 kg/day per household (Table 9). Households include 1 with a sari-sari store, 1 with 9 members, and 1 with a canteen. The latter had the highest total plastic waste generation: 2.23 kg/day. Despite having many business enterprises, the city of Bacoor disposed of the least amount of waste. This may be due to people collecting their plastic waste and selling it as part of the solid waste management initiatives of the barangay.

Barangay Maitim 2nd Central from Tagaytay City is located in the upland portion of Imus River Watershed. From the 197 surveyed households, there were 13 with sari-sari stores, 2 with canteens, 2 with online food stores, and 1 with a food vendor. There were 3 households with 7 or more inhabitants. The total plastic waste generated during the seven-day period was 205 kg, or an average of 29.29 kg plastic waste per household per day.

Increasing population typically leads to increasing waste generation, as does urbanization (Hoornweg & Bhada-Tata, 2012). This plastic waste, if not properly collected and treated, will be transported to the oceans (via river systems) where 80% of all marine debris, including floating and sinking waste, is composed of plastic (International Union for Conservation of Nature, 2018). Considering the rapid population growth of cities and municipalities located in the Imus River Watershed, it is expected that waste generation in the watershed will increase. This is

supported by the finding that households contribute the most to the total amount of plastic waste collected by each local government unit.

Generation of Plastic Waste Per Household and Per Capita

The highest per household and per capita plastic waste generation was in Dasmarinas City (Table 10). The average per capita plastic waste generation throughout the entire province was estimated by using the average household size in Cavite which is 4.1. The resulting mean average plastic waste generation per capita of 0.05 Kg was used in the hotspot analysis of plastics waste generation in the watershed.

Table 9. Plastic waste generation of selected barangays in IRW.

Sampling Site	Physiographic Representation	Total Number of Household	Total Plastic Generation in 7-days (kg)	Average Plastic Generation Per day (kg/day)
Maitim 2nd Central, Tagaytay City	Upland	197	205	29.29
Burol 1, Dasmarinas, City	Central Hilly	349	777.24	111.03
Mabolo 1, Bacoor City	Lowland	187	64.18	9.17
TOTAL		**733**	**1,046.42**	**149.49**

Table 10. Estimated average plastic waste generation in selected barangays per household and per capita.

Selected Barangay	Average plastic waste generation Per Household (APG_{HH}) in kg/day/HH	Average plastic waste generation Per Capita (APG_{PC}) in kg/day/capita
Maitim 2nd Central, Tagaytay City	0.15	0.04
Burol 1, Dasmariñas, City	0.32	0.08
Mabolo 1, Bacoor City	0.05	0.01
MEAN	**0.17**	**0.05**

Population Distribution within Imus River Watershed

A population of 1,351,057 was calculated to be residing inside the watershed as of 2015 (Figures 15-16).

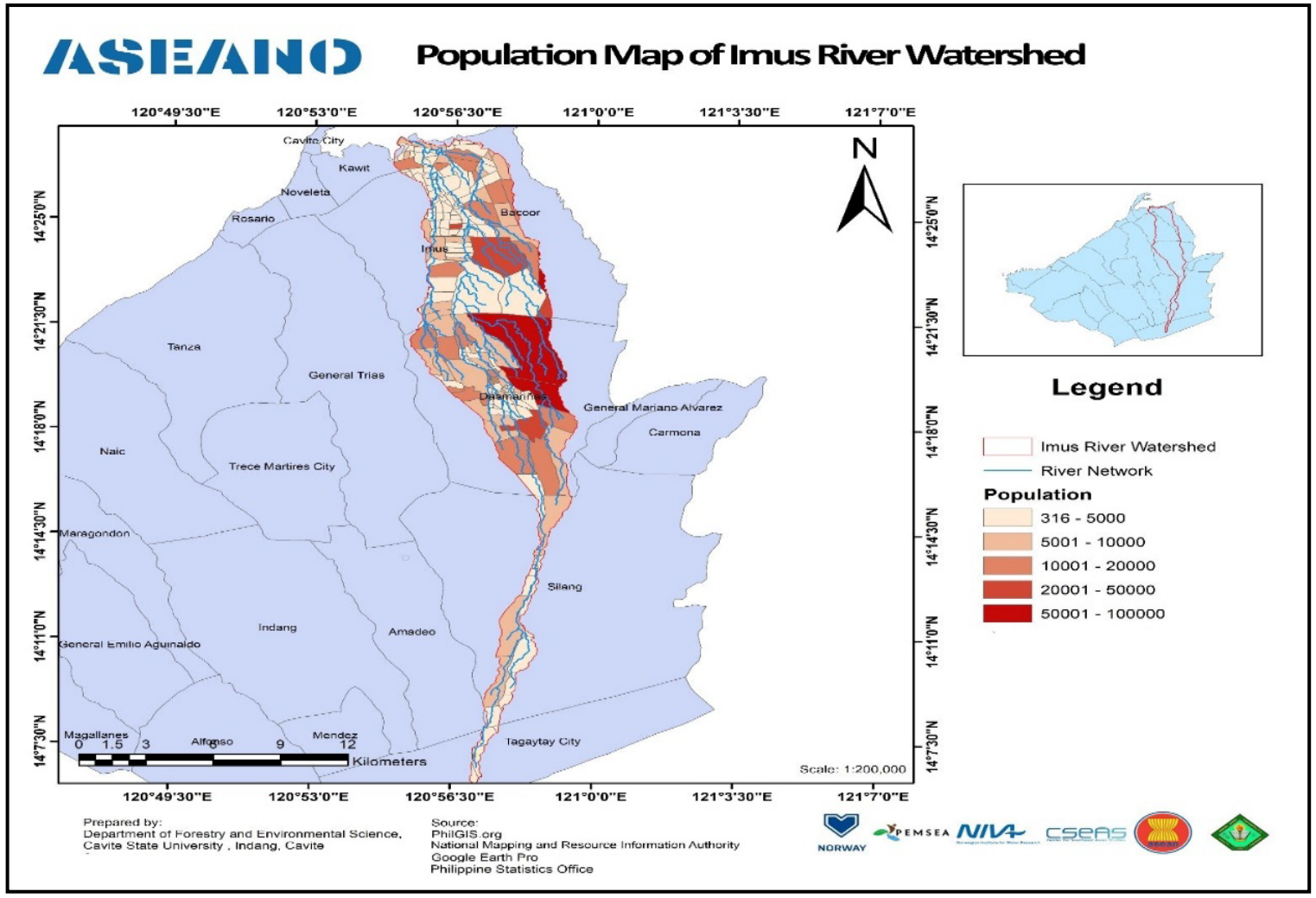


Figure 15. The population of all barangays within the Imus River Watershed.

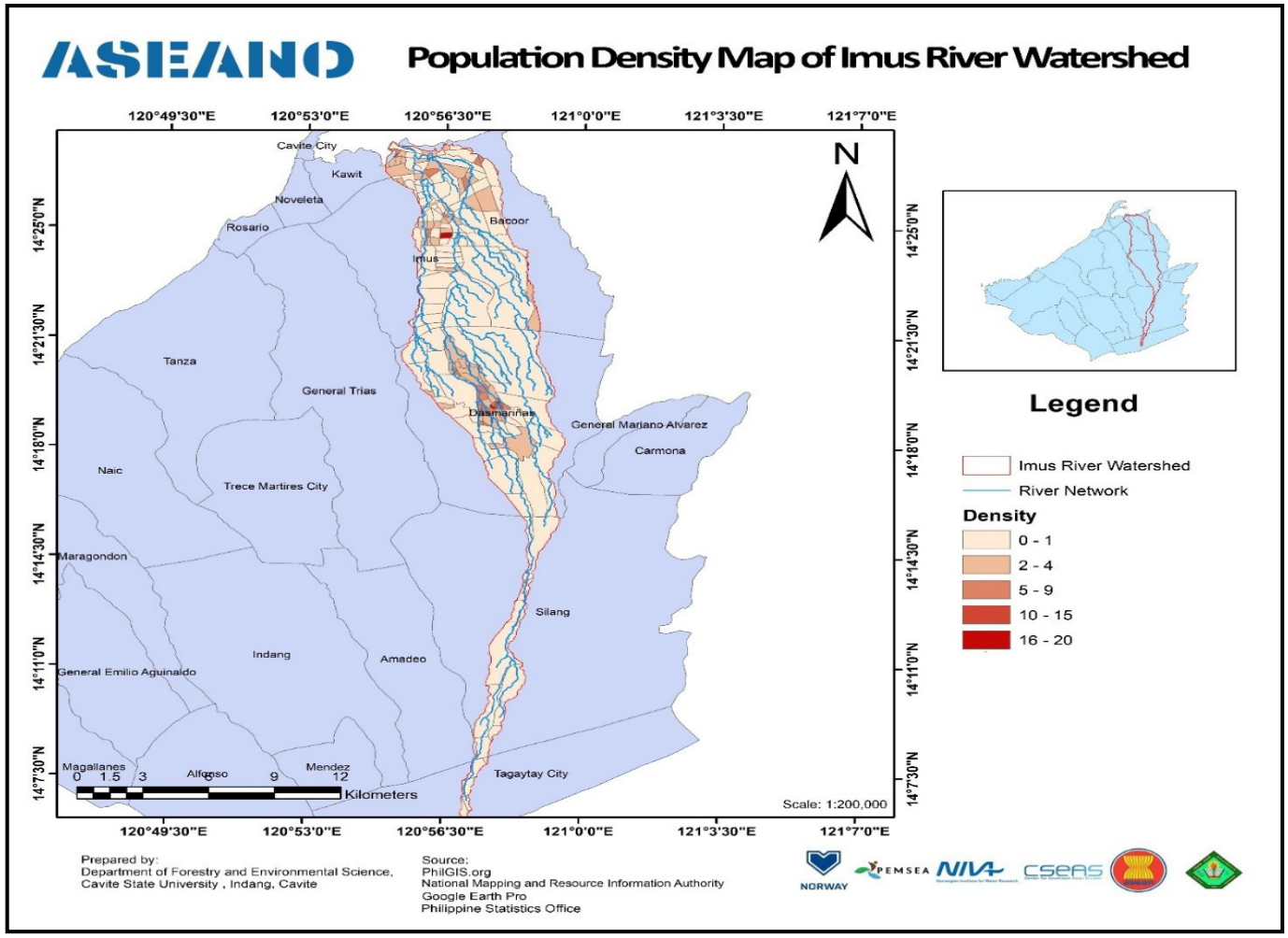


Figure 16. The population density of barangay communities within the Imus River Watershed.

Hotspot Analysis of Plastic Waste Generation

Hotspot analysis is a mapping and spatial analysis technique for the identification of clustering of spatial phenomena. Identified hotspot areas represent areas with higher concentrations of events compared to the expected number given by a random distribution of events. In this study, the term hotspot refers to a region responsible for a larger than average estimated leakage of plastics into the watershed. The Getis-Ord G* algorithm in ArcMap produces Z-scores and P-Values. A high Z-score and small P-value for a feature indicates a significant hotspot, while a low (negative) Z-score and small P-value indicates a significant cold spot. The higher (or lower) the Z-score, the more intense the clustering. A Z-score near zero indicates no spatial clustering.

Two areas stand out in the analysis (Appendix Table 21). An intensified clustering of high plastic waste generating barangays and significant hotspot region was identified in the City of Dasmariñas (Figure 17). Various tributaries of the Imus River converge in the area and, especially if there is improper management of plastic waste, this is likely to be an important zone for plastic waste leakage into the river system. An intensified clustering of low plastic waste generating barangays and significant coldspot region was identified in parts of Imus, Kawit and Bacoor, in the downstream section of the watershed. This cold spot should not be ignored, as increasing plastic waste generation in this area could transform this region into a hotspot, due to its intensified clustering.

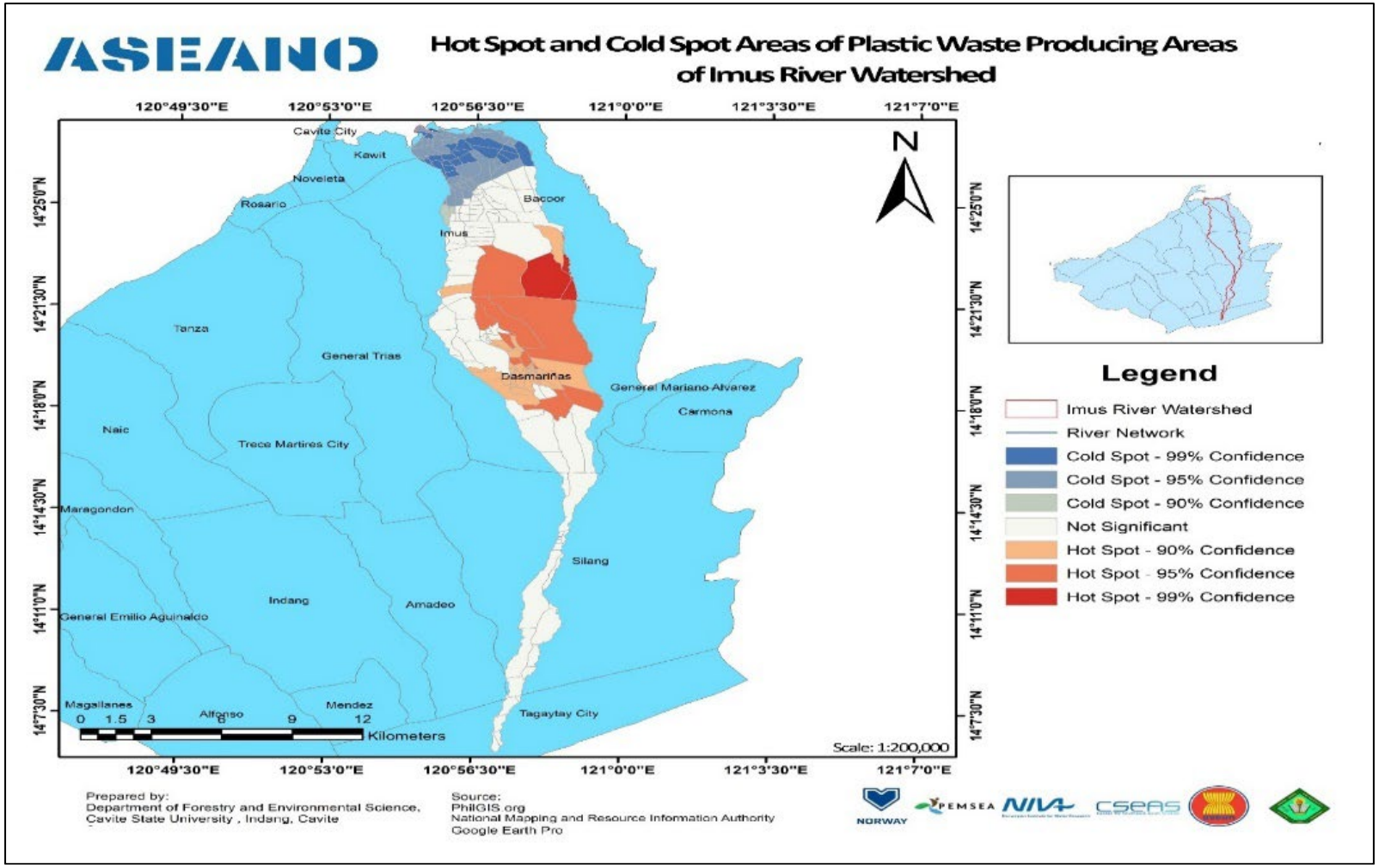


Figure 17. Hot spot and cold spot areas of plastic waste producing areas in the Imus River Watershed.

Conclusions

The Imus River system traverses seven cities and municipalities that include parts of Tagaytay City, Silang, and Amadeo in the upland areas, a large part of the densely populated and urbanized cities of Dasmariñas and Imus City in the central hilly areas, and portions of the lowland City of Bacoor and the coastal Municipality of Kawit. It has a total drainage area of 11,259.80 hectares.

A total of 222 barangays were identified to lie fully or partially within the boundaries of the watershed, leaving the watershed with a total population of about 1,351,057.

Out of the sources of waste that feed into the waste management systems in the watershed, households are the biggest generator of wastes (63 – 97.73%), followed by commercial establishments (2.16 – 35.68%), institutions (0.08 – 5.73%), and industries (0.01 – 2.15%).

778 commercial, institutional, and industrial establishments were identified within the watershed. Bacoor City contained the most out of any of the local government areas, followed by Dasmariñas City, Imus City, and Amadeo.

A total of 54 waste storage facilities were found in the watershed. Waste storage facilities divert some plastic and other wastes, both recyclables and residuals. This reduces the amount of plastic that end up in landfills or final disposal sites, and likely the amount that leaks into the river system.

From the 7-day characterization study in three selected barangay communities, an average of 113.03 kg of plastics was generated daily by the households in Barangay Burol 1, Dasmariñas City; 9.17 kg/day in Barangay Mabolo 1, Bacoor City; and 29.29 kg/day in Barangay Maitim 2nd Central, Tagaytay City. An average of 0.17 Kg/day per household of plastics were generated in the watershed, or 0.05 Kg/day per capita.

An intensified clustering of high plastic waste generating barangays and significant hotspot region was identified in Dasmariñas City. Various tributaries of the Imus River converge in the area and, which combined with large populations means this is likely to be an important zone for plastic waste leakage to the river system. A cluster of low plastic waste generating barangays and thus a significant coldspot region was identified in parts of Imus, Kawit, and Bacoor.

References

Aarnio, T.; Hämäläinen, A. (2008). Challenges in packaging waste management in the fast food industry. Resource. Conserve. Recycle. 2008, 52, 612–621.

Abreo, N.A. (2018). Marine plastics in the Philippines: a call for research. *Philippine Science Letters*, 11(1).

Aye, Lu & Widjaya, Elita. (2006). Environmental and economic analyses of waste disposal options for traditional markets in Indonesia. Waste management (New York, N.Y.). 26. 1180-91.10.1016/j.wasman.2005.09.010.

Geyer, R., Jambeck, J. and Lavender Law, K. (2017), "Production, use, and fate of all plastics ever made," Science Advances, Vol. 3, no. 7, DOI:10.1126/sciadv.1700782.

Andrary, A.L. (2011). Microplastics in the marine environment. *Marine Pollution Bulletin,* 62(8), 1596-1605. https://doi.org/10.1016/j.marpolbul.2011.05.030

Andrady, A. L., and Neal, M. A. (2009). Applications and societal benefits of plastics. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *364*(1526), 1977-1984.

Argamino, C.R. and Janairo, J.I. (2016). Qualitative Assessment and Management of Microplastics in Asian Green Mussels (*Perna viridis*) Cultured in Bacoor Bay, Cavite, Phillipines. *Environment Asia*, 9(2), 48-54.

Barboza, L. G. A., Vethaak, A. D., Lavorante, B. R., Lundebye, A. K., & Guilhermino, L. (2018). Marine microplastic debris: An emerging issue for food security, food safety and human health. *Marine Pollution Bulletin*, 133, 336–348.

Besseling, E., Foekema, E. M., van den Heuvel-Greve, M. J., & Koelmans, A. A. (2017). The effect of microplastic on the uptake of chemicals by the lugworm Arenicola marina (L.) under environmentally relevant exposure conditions. *Environmental science & technology*, *51*(15), 8795-8804. https://doi.org/10.1021/acs.est.7b02286

Blettler, M. C., Garello, N., Ginon, L., Abrial, E., Espinola, L. A., and Wantzen, K. M. (2019). Massive plastic pollution in a mega-river of a developing country: Sediment deposition and ingestion by fish (Prochilodus lineatus). *Environmental Pollution*, *255*, 113348. https://doi.org/10.1016/j.envpol.2019.113348

Cesar, C. C.,9 & Carvalho, M. S. (2011). Stratified sampling design and loss to follow-up in survival models: evaluation of efficiency and bias. *BMC Medical Research Methodology*, 11(1), 1-9. https://doi.org/10.1186/1471-2288-11-99

DTI. (2019). 2019 Micro Small Medium Enterprises Statistics. Available online at https://www.dti.gov.ph/resources/msme-statistics/

EMB-CALABARZON. (2018). Solid Waste Management Consolidated Report. Available online at http://calabarzon.emb.gov.ph/wp-content/uploads/2019/02/2018-swm-consolidated-report.pdf

Esplana, M. C. A. (2019) Extent of Compliance of the 23 Cities and Municipalities In The Province of Cavite To Republic Act 9003.

ESRI. 2020. How Hot Spot Analysis (Getis-Ord Gi*) works. Retrieved on June 30, 2020 from https://pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/h-how-hot-spot-analysis-getis-ord-gi-spatial-stati.htm

Faure, F., Demars, C., Wieser, O., Kunz, M., and De Alencastro, L. F. (2015). Plastic pollution in Swiss surface waters: nature and concentrations, interaction with pollutants. *Environmental chemistry*, *12*(5), 582-591. https://doi.org/10.1071/EN14218

Fok, L. and Cheung, P. K. (2015). Hong Kong at the Pearl River Estuary: A hotspot of microplastic pollution. *Marine pollution bulletin*, *99* (1-2), 112-118. https://doi.org/10.1016/j.marpolbul.2015.07.050

Global Alliance for Incinerator Alternatives, “Regulating Single-Use Plastics In The Philippines: Opportunities to move forward”

Gutberlet, J. (2017). Waste in the City: Challenges and Opportunities for Urban Agglomerations. https://www.intechopen.com/chapters/57824

Hopewell, J., Dvorak, R., and Kosior, E. (2009). Plastics recycling: challenges and opportunities. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *364*(1526), 2115-2126. https://doi.org/10.1098/rstb.2008.0311

International Union for Conservation of Nature. (2018). Marine Plastics. Retrieved from https://www.iucn.org/sites/dev/files/marine_issues_brief_final_0.pdf

J. Vince, B.D. Hardesty (2017). Plastic pollution challenges in marine and coastal environments: from local to global governance. *Restor. Ecol*., 25 (2017), pp. 123-128, 10.1111/rec.12388

Kiessling, T., Knickmeier, K., Kruse, K., Brennecke, D., Nauendorf, A., and Thiel, M. (2019). Plastic pirates sample litter at rivers in Germany– Riverside litter and litter sources estimated by schoolchildren. *Environmental Pollution*, 245, 545–557. https://doi.org/10.1016/j.envpol.2018.11.025

Koelmans, A. A., Bakir, A., Burton, G. A., and Janssen, C. R. (2016). Microplastic as a vector for chemicals in the aquatic environment: critical review and model-supported reinterpretation of empirical studies. *Environmental science & technology*, *50*(7), 3315-3326. https://doi.org/10.1021/acs.est.5b06069

Lechner, A., Keckeis, H., Lumesberger-Loisl, F., Zens, B., Krusch, R., Tritthart, M., Tritthart, M., Glas, M., and Schludermann, E. (2014). The Danube so colourful: a potpourri of plastic litter outnumbers fish larvae in Europe's second largest river. *Environmental pollution*, *188*, 177-181.

Levy, P. S., and Lemeshow, S. (2013). Sampling of populations: methods and applications. John Wiley & Sons.

Mihai, F. C. (2018). Rural plastic emissions into the largest mountain lake of the eastern Carpathians. *Royal Society Open Science*, 5(5), 172396. https://doi.org/10.1098/rsos.172396

Moore, C. J., Lattin, G. L., and Zellers, A. F. (2011). Quantity and type of plastic debris flowing from two urban rivers to coastal waters and beaches of Southern California. *Revista de Gestão Costeira Integrada-Journal of Integrated Coastal Zone Management*, *11*(1), 65-73.

Ncube, L.K.; Ude, A.U.; Ogunmuyiwa, E.N.; Zulkifli, R.; Beas, I.N. (2021). An Overview of Plastic Waste Generation and Management in Food Packaging Industries. Recycling 2021, 6, 12. https://doi.org/ 10.3390/recycling6010012

PEMSEA and Provincial Government of Cavite, Philippines. 2017. State of the Coasts of Cavite Province. Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines.

Paler, M.K., Malenab, M.C., Maralit, J.R., and Nacorda, H.M. (2019). Plastic waste occurrence on a beach off southwestern Luzon, Philippines. *Marine Pollution Bulletin*, 141(2019), 416-419. https://doi.org/10.1016/j.marpolbul.2019.02.006

Pech, M., Vrchota, J. (2020). Classification of Small- and Medium-Sized Enterprises Based on the Level of Industry 4.0 Implementation

Rech, S., Macaya-Caquilpán, V., Pantoja, J. F., Rivadeneira, M. M., Madariaga, D. J., and Thiel, M. (2014). Rivers as a source of marine litter–a study from the SE Pacific. *Marine pollution bulletin*, *82*(1-2), 66-75. https://doi.org/10.1016/j.marpolbul.2014.03.019

Redondo-Hasselerharm, P. E., Falahudin, D., Peeters, E. T., and Koelmans, A. A. (2018). Microplastic effect thresholds for freshwater benthic macroinvertebrates. *Environmental Science & Technology*, 52(4), 2278–2286.

Reis, F., Wu, S. and Potyatynnyk, K. (2019). Life in plastics, it's not fantastic: The economics of plastic pollution. *In the Science for Sustainability journal (3).* Retrieved from https://www.greenofficevu.nl/wp-content/uploads/2019/08/Life-In-Plastic.pdf

Schwarz, A. E., Ligthart, T. N., Boukris, E., and Van Harmelen, T. (2019). Sources, transport, and accumulation of different types of plastic litter in aquatic environments: a review study. *Marine Pollution Bulletin* 143, 92-100. https://doi.org/10.1016/j.marpolbul.2019 04.029

van Emmerik, T. and Schwarz, A. (2020). Plastic debris in rivers. *WIREs Water* 7:e1398.doi: 10.1002/wat2.1398

van Sebille, E., England, M. H., and Froyland, G. (2012). Origin, dynamics and evolution of ocean garbage patches from observed surface drifters. *Environmental Research Letters*, 7(4), 044040.

Vezer, M. and Morrow, D. (2018). Blue investigating: searching for solutions to ocean plastics. DOI: 10.13140/RG.2.2.24098.27842.

Yaro, Margaret & Obongha, Ukpali & Okon, Asuquo. (2019). Waste Disposal Scenario In Commercial Market Of Calabar, Southern Nigeria. Journal of Global Biosciences. 6301-6312.

Annexes

Appendix Table 1. List of establishments classified as Micro, Small, Medium and Large Enterprises in Tagaytay City.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
Adora's Construction Supply	Commercial	14° 7'44.94"N120°57'28.73"E	Micro
Brahma Kumaris Center for Spritiual Learning	Institutional	14° 6'31.07"N120°56'59.73"E	Micro
Brudrick Marion School	Institutional	14° 7'36.42"N120°57'23.27"E	Small
Bungao Resto	Commercial	14° 8'0.63"N 120°57'24.35"E	Small
Calvario Ortho Dental Clinic	Institutional	14° 7'57.44"N120°57'24.77"E	Micro
Betany Christian Academy	Institutional	14° 7'45.61"N120°57'28.39"E	Micro
Diner's Restaurant	Commercial	14° 6'9.70"N120°57'8.64"E	Small
Dream Language Tutorial Academy Inc.	Institutional	14° 6'15.17"N 120°57'3.37"E	Small
E. Rivera Hotel	Commercial	14° 6'10.03"N120°57'1.80"E	Small
Gatbucks	Commercial	14° 6'9.71"N 120°57'8.64"E	Small
Iglesia Ni Cristo	Institutional	14° 6'37.79"N120°57'3.09"E	Micro
Ka Rey Seafood Restaurant	Commercial	14° 7'43.71"N120°57'29.52"E	Small
LCB Apartelle and Resort	Commercial	14° 8'1.99"N120°57'23.80"E	Micro
Leslie's II Restaurant	Commercial	14° 6'7.29"N120°57'6.82"E	Small
LG 24 Mart Korean Grocery	Commercial	14° 6'9.96"N120°57'2.49"E	Micro
Magallanes Square Commercial Center	Commercial	14° 6'10.64"N 120°57'4.38"E	Medium
Maitim II Elementary School	Institutional	14° 7'51.02"N120°57'17.35"E	Small
Maligaya Market	Commercial	14° 6'39.26"N120°57'10.24"E	Small
Memory Lane (Restaurant)	Commercial	14° 6'34.95"N120°56'55.24"E	Small
Repatrix Sisters of Sacred Heart	Institutional	14° 6'29.65"N120°57'2.72"E	Micro
RePhil Gas station	Commercial	14° 7'46.54"N120°57'27.07"E	Micro
Rolando's (Restaurant)	Commercial	14° 6'9.71"N120°57'7.89"E	Small
Royale Parc Hotel	Commercial	14° 6'31.55"N120°57'19.70"E	Small

Silang Crossing West Brgy Hall	Institutional	14° 6'17.19"N 120°57'2.35"E	Small
Starbucks	Commercial	14° 6'8.81"N120°57'8.19"E	Small
Tanthoms Pool House Bar and Restaurant	Commercial	14° 7'38.36"N120°57'29.38"E	Micro
The Biblical Church of Christ	Institutional	14° 7'49.75"N120°57'27.28"E	Micro
Tower Ground	Commercial	14° 6'9.91"N120°57'9.81"E	Small
Viewsite Restaurant	Commercial	14° 6'27.46"N120°57'17.42"E	Small

Appendix Table 2. List of establishments classified as Micro, Small, Medium and Large Enterprises in Amadeo Cavite.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
Ate's Canteen	Commercial	14°8'2.47"N120°57'22.42"E	Micro
AMP Steel and Glass Aluminum Works	Industrial	14° 8'6.98"N 120°57'20.82"E	Small
Buho Restaurant	Commercial	14° 8'6.51"N 120°57'22.26"E	Micro
Colette's Pasalubong	Commercial	14° 8'6.86"N120°57'22.13"E	Micro
E. R.A. Aluminum Glass Ltd. Co.	Industrial	14° 8'3.72"N 120°57'21.28"E	Medium
Emission Testing Center	Commercial	14° 8'4.69"N120°57'21.23"E	Micro
Fruit Stalls	Commercial	14° 8'2.54"N120°57'23.31"E	Micro
Kusina Master Concepts, Inc.	Commercial	14° 8'5.75"N 120°57'21.19"E	Micro
Living Water Refilling Station	Commercial	14° 8'5.72"N120°57'22.53"E	Micro
New Tibayan Construction Supply	Commercial	14° 8'1.91"N 120°57'22.41"E	Small
Rede Poultry Supply	Commercial	14° 8'3.21"N120°57'22.08"E	Micro

Appendix Table 3. List of establishments classified as Micro, Small, Medium and Large Enterprises in Silang Cavite.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
7 eleven	Commercial	14°13'52.40"N120°58'31.63"E	Micro
Acienda	Commercial	14°11'2.09"N 120°57'36.63"E	Medium
Adventist International Institute of Advanced Studies	Institutional	14°12'7.99"N 120°58'2.72"E	Medium
Alemaxx Corp	Industrial	14°15'4.00"N 120°59'11.00"E	Small
Alfamart	Commercial	14°13'21.03"N 120°58'25.69"E	Micro
Amblada Farm	Commercial	14° 9'9.43"N120°57'22.79"E	Small
AustPhil Food Manufacturing (Cheese manufacturer)	Industrial	14°10'59.40"N 120°57'59.35"E	Small
Balite II Elementary School	Institutional	14°11'2.63"N 120°58'27.88"E	Small
Basic Necessity		14° 10'20.55"N120°57'37.60"E	Micro
Berjes Trading Corp.	Industrial	14°14'59.96"N 120°59'8.75"E	Small
Brown International School Inc.	Institutional	14°11'26.13"N120°57'58.40"E	Small
Café Sant' Antonio	Commercial	14° 9'2.55"N 120°57'23.09"E	Micro
Cavite State University Silang Campus	Institutional	14°14'27.42"N 120°58'44.57"E	Medium
Commercial Bldg.	Commercial	14°13'51.49"N 120°58'32.98"E	Micro
Consolidated Business Management (Logistics Solutions Inc.)	Commercial	14°15'7.03"N 120°59'11.84"E	Micro
Dragon Textile Mills Inc.	Industrial	14°12'22.86"N 120°58'6.65"E	Medium
Duchess Royal Hotel and Resort	Commercial	14°12'48.56"N 120°58'33.34"E	Small
DYZ Hardware	Commercial	14°11'27.53"N 120°57'43.58"E	Micro
Epitome Dream Builders	Commercial	14°11'21.88"N120°57'44.15"E	Small
Euro-med Laboratories Phils.Inc.	Industrial	14°11'5.33"N 120°57'51.28"E	Medium
Eurotiles Industrial Corporation	Industrial	14°15'3.88"N 120°58'37.34"E	Large
Ferramentabilt Corp. Hardware	Commercial	14°11'29.48"N 120°57'44.20"E	Small
Geomillenium	Commercial	14°14'58.28"N120°59'9.07"E	Small
Gold Medal Trading	Industrial	14° 8'31.37"N120°57'42.44"E	Small
Golden Egg Agricultural Products Inc.	Commercial	14°13'5.29"N 120°58'22.10"E	Micro

Green Papaya Hotel and Resort	Commercial	14°10'27.26"N 120°57'41.34"E	Small
Green Thumb Garden	Commercial	14°10'47.04"N 120°58'1.00"E	Micro
H and M Garden	Commercial	14°11'10.65"N 120°58'11.08"E	Micro
Hoxin Hardware	Commercial	14°12'12.26"N 120°57'57.66"E	Small
Hyundai	Commercial	14°14'58.28"N 120°59'9.07"E	Small
Iba Brgy Hall	Institutional	14°13'3.24"N 120°58'38.47"E	Micro
Iba Elementary School	Institutional	14°12'59.27"N 120°58'38.94"E	Small
Iglesia ni Cristo	Institutional	14° 8'34.73"N 120°57'45.98"E	Micro
Infinity Eight Junkshop	Commercial	14° 8'40.45"N120°57'26.64"E	Small
International Institute of Rural Reconstruction	Commercial	14°15'46.86"N 120°58'32.10"E	Micro
Life and Culture Ministry Mission Center	Institutional	14°11'2.78"N120°58'11.73"E	Micro
Magnifico Construction	Commercial	14°13'54.08"N 120°58'44.05"E	Small
MCGK Flower Farm	Commercial	14°10'40.67"N 120°58'0.78"E	Micro
MCGK Woodworks Inc.	Industrial	14°10'59.06"N 120°57'49.68"E	Small
Mercury Drugs	Commercial	14°13'23.36"N 120°58'26.05"E	Micro
Narima Garden Resort	Commercial	14°14'45.97"N 120°58'56.94"E	Small
New Lalaan Corporation	Industrial	14°11'18.39"N 120°57'38.18"E	Medium
Our Lady of Candelaria Parish Church	Institutional	14°13'26.25"N120°58'27.35"E	Micro
Over Flowing Christian Academy	Institutional	14°10'55.88"N 120°58'17.79"E	Small
Plasticel Plastic Corp	Industrial	14°15'4.08"N 120°59'8.37"E	Small
Poultry Breeder Farm	Commercial	14°15'11.36"N120°59'14.25"E	Small
Precious Gem's Day Care Center	Institutional	14°14'1.23"N 120°58'44.47"E	Micro
Ram's House of Wine	Industrial	14° 8'27.40"N 120°57'41.10"E	Small
Red River Enterprises	Industrial	14°15'16.32"N 120°59'13.94"E	Small
Rely's Garden	Commercial	14°11'3.11"N120°58'6.64"E	Micro
Rodem and Farm Garden	Commercial	14°10'37.32"N 120°57'36.74"E	Small
Rogationist College	Institutional	14° 8'59.26"N 120°57'22.03"E	Medium
Sabutan Elementary School	Institutional	14°14'0.52"N 120°58'44.56"E	Small
Sacred Heart Villa School	Institutional	14°11'28.79"N 120°57'44.04"E	Small
Seaoil	Commercial	14°13'51.96"N 120°58'32.64"E	Micro
Silang Infant Jesus Academy	Institutional	14°13'26.83"N 120°58'29.90"E	Small

Silang Municipality	Institutional	14°13'24.30"N 120°58'28.83"E	Medium
Singapore School Manila Green Campus	Institutional	14°11'11.79"N 120°58'27.88"E	Medium
Sir Raymiel Academy	Institutional	14°11'35.31"N 120°57'44.80"E	Small
Soga Miga Korean Restaurant	Commercial	14°10'38.37"N 120°57'38.90"E	Micro
Somerhill Farms	Commercial	14° 9'11.86"N 120°57'52.10"E	Micro
St. John Marie Vianney Parish (under construction)	Institutional	14° 9'8.74"N 120°57'26.66"E	Micro
St. Paul Seminary Foundation	Institutional	14°11'29.91"N120°57'56.03"E	Small
Starkson Packaging Inc.	Industrial	14°12'16.69"N 120°57'59.24"E	Small
Sustamina Poultry Dressing Plant	Industrial	14°14'48.52"N 120°58'51.58"E	Small
SylPaulJoyce Furniture, Lights and Décor	Commercial	14° 10'46.28"N120°57'39.68"E	Small
Teresa's Garden	Commercial	14° 10'46.28"N120°57'38.81"E	Small
The Sisters of Mary School	Institutional	14°15'37.25"N 120°58'36.73"E	Small
Toledo Brgy Hall	Institutional	14° 9'13.75"N 120°57'52.42"E	Micro
Toyota Silang	Commercial	14° 12'31.18"N 120°58'1.60"E	Small
Tubuan 1 Brgy Hall	Institutional	14°12'52.15"N 120°58'15.77"E	Micro
Velazco Farm and Resort	Commercial	14°13'24.33"N 120°58'37.41"E	Small
Villa Florenda Private Resort	Commercial	14°15'12.66"N 120°59'10.24"E	Small
Wellpack, Inc. printing and Packaging,	Industrial	14°10'22.95"N 120°57'40.89"E	Small
Western Synergy Sales Trading	Industrial	14°11'1.06"N 120°57'46.83"E	Small
Wilcon Depot	Commercial	14° 8'59.79"N 120°57'25.57"E	Medium
Woojin Window Glass Corporation	Industrial	14° 8'52.30"N120°57'20.79"E	Medium

Appendix Table 4. List of establishments classified as Micro, Small, Medium and Large Enterprises in Dasmariñas, City.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
1 Stop Mini Store	Commercial	14°21'3.89"N120°58'30.43"E	Micro
4C Lodge	Commercial	14°20'41.73"N120°56'16.00"E	Micro
7 Eleven	Commercial	14°19'35.63"N120°56'24.56"E	Micro
7 Eleven	Commercial	14°18'8.96"N120°57'15.13"E	Micro
7 Eleven	Commercial	14°19'5.10"N120°58'29.88"E	Micro
7 Eleven	Commercial	14°19'19.65"N120°57'50.26"E	Micro
7 Eleven	Commercial	14°20'46.79"N120°58'53.04"E	Micro
7 Eleven	Commercial	14°19'14.57"N120°59'4.30"E	Micro
7 Eleven	Commercial	14°21'12.47"N120°58'51.85"E	Micro
A1 Driving Company Inc.	Industrial	14°17'46.99"N120°58'1.36"E	Small
Alfamart	Commercial	14°19'57.57"N120°55'53.16"E	Micro
Alfamart	Commercial	14°19'35.75"N120°56'55.31"E	Micro
Alfamart	Commercial	14°20'42.23"N120°55'29.55"E	Micro
Alfamart	Commercial	14°19'4.89"N120°58'31.91"E	Micro
Alfamart	Commercial	14°19'11.36"N120°56'26.61"E	Micro
Alfamart	Commercial	14°19'17.67"N120°58'4.08"E	Micro
Alfamart	Commercial	14°20'22.48"N120°56'58.44"E	Micro
AMA Computer College	Institutional	14°19'37.18"N120°56'28.72"E	Small
Amethyst Commercial Bldg.	Commercial	14°17'42.13"N120°57'25.66"E	Small
Anytime Veal Burger	Commercial	14°21'18.80"N120°58'52.25"E	Micro
Aquastar Cavite	Industrial	14°16'9.73"N120°58'6.21"E	Small
Asia Medic Family Hospital and Medical Center	Institutional	14°17'56.35"N120°57'23.71"E	Medium
Asian Institute of Computer Studies	Institutional	14°19'44.67"N120°56'23.38"E	Small
Asian Institute of Science and Technology	Institutional	14°19'38.59"N120°56'23.52"E	Small
Blessed Mary Academy	Institutional	14°20'57.80"N120°56'20.76"E	Small
Brgy Hall Paliparan 3	Institutional	14°18'50.67"N120°59'0.92"E	Small
Brgy San Juan Multipurpose Hall	Institutional	14°20'24.77"N120°57'6.30"E	Small
Brightways Academy	Institutional	14°19'54.34"N120°56'14.23"E	Small
Brookefield International College	Institutional	14°19'39.21"N120°57'1.39"E	Small
Carpel Environment Corp.	Commercial	14°19'4.05"N120°59'6.04"E	Small
Casa Real Montessori	Institutional	14°20'36.61"N120°56'12.92"E	Small

Century Commercial Complex I	Commercial	14°20'1.18"N120°59'12.79"E	Small
Century Commercial Complex II	Commercial	14°20'3.21"N120°59'11.88"E	Small
Century Commercial Complex III	Commercial	14°20'5.12"N120°59'11.28"E	Small
Century Commercial Complex IV	Commercial	14°20'7.39"N120°59'11.25"E	Small
Century Commercial Complex V	Commercial	14°20'9.18"N120°59'11.23"E	Small
Chowking	Commercial	14°19'13.17"N120°59'4.02"E	Small
Christ Life Academy Foundation Incorporated	Institutional	14°18'36.74"N120°58'5.05"E	Micro
Christian Vision School	Institutional	14°19'42.46"N120°56'0.34"E	Small
Chula Vista Inn	Commercial	14°21'10.70"N120°56'17.19"E	Micro
Church of Jesus Christ Latter Day	Institutional	14°19'36.72"N120°57'9.43"E	Micro
Citi Hardware	Commercial	14°16'32.40"N120°57'58.33"E	Small
Coca Cola Bottlers Phils. Inc.	Industrial	14°17'46.76"N120°57'26.21"E	Large
Coco Valley Resort	Commercial	14°18'59.29"N120°59'7.42"E	Small
Colegio de Salitran	Institutional	14°20'35.54"N120°56'49.65"E	Small
Commercial Bldg.	Commercial	14°19'14.33"N120°59'3.30"E	Small
Commercial Bldg.	Commercial	14°19'15.97"N120°59'3.20"E	Small
Commercial Bldg.	Commercial	14°19'14.45"N120°59'1.71"E	Small
Congressional National Highschool	Institutional	14°19'5.62"N120°57'8.73"E	Small
Corinthian Institute of Cavite	Institutional	14°19'30.03"N120°57'44.33"E	Small
Daewoo	Industrial	14°17'20.64"N120°59'24.39"E	Small
Danhill Academy	Institutional	14°20'50.92"N120°58'27.36"E	Small
Dansart Angels Academy	Institutional	14°19'17.92"N120°57'6.70"E	Small
Dasmarinas City Hall	Institutional	14°19'35.41"N120°56'10.58"E	Medium
Dasmarinas City Library	Institutional	14°19'24.89"N120°57'42.68"E	Small
Dasmarinas East National Highschool	Institutional	14°19'16.98"N120°58'16.85"E	Medium
Dasmarinas Elementary School Annex	Institutional	14°19'18.43"N120°58'15.08"E	Medium
Dasmarinas Integrated High School	Institutional	14°19'29.87"N120°57'43.29"E	Medium
Dasmarinas Medical Center	Institutional	14°21'11.48"N120°58'53.36"E	Medium
Dasmarinas National Highschool	Institutional	14°19'27.85"N120°57'38.75"E	Medium

Dasmarinas North National Highschool	Institutional	14°20'27.20"N120°57'2.20"E	Medium
Dasmarinas West National High School	Institutional	14°19'13.13"N120°57'23.80"E	Medium
Dasmariñas Elementary School	Institutional	14°19'35.21"N120°57'36.13"E	Medium
David's Tea House	Commercial	14°19'53.85"N120°56'21.10"E	Micro
De La Salle University - Dasmarinas	Institutional	14°19'30.12"N120°57'28.22"E	Medium
Divine Grace School Dasmarinas	Institutional	14°18'15.07"N120°59'19.98"E	Small
DLSU Health Science Institute	Institutional	14°19'38.34"N120°56'36.38"E	Small
Double V Resort	Commercial	14°20'9.70"N120°56'42.77"E	Small
Dr. Jose Rizal Elementary School	Institutional	14°20'21.65"N120°57'20.69"E	Micro
Emilio Aguinaldo College	Institutional	14°19'33.90"N120°56'44.96"E	Medium
Emilio Aguinaldo Medical Center	Institutional	14°20'54.98"N120°56'23.98"E	Medium
Ever Supermarket	Commercial	14°19'14.28"N120°59'2.65"E	Small
Far Eastern Polytechnical College	Institutional	14°20'5.02"N120°57'14.34"E	Small
Fiat Lux Academy	Institutional	14°21'35.03"N120°55'58.74"E	Small
First Solid Builders Inc.	Commercial	14°17'45.13"N120°59'34.15"E	Large
Garnet Commercial Bldg.	Commercial	14°17'38.85"N120°57'26.91"E	Micro
Geneva Diato Construction & Realty Corp.	Commercial	14°20'8.89"N120°56'16.52"E	Micro
Harlem's Grocery	Commercial	14°21'10.11"N120°58'42.35"E	Small
Harley's General Merchandise	Commercial	14°16'15.65"N120°57'57.56"E	Small
Hitachi Industrial Machinery	Industrial	14°17'56.43"N120°57'58.18"E	Medium
Honda Cars	Commercial	14°20'44.59"N120°56'12.79"E	Small
Hotel De Dasmarinas	Commercial	14°19'33.59"N120°56'15.34"E	Micro
Iglesia Ni Cristo	Institutional	14°19'16.82"N120°58'23.04"E	Micro
Iglesia Ni Cristo	Institutional	14°16'48.26"N120°57'48.35"E	Micro
Immaculate Concepcion Academy (North Campus)	Institutional	14°20'55.83"N120°56'18.13"E	Small
Infant Jesus Montessori	Institutional	14°19'41.03"N120°58'42.77"E	Micro
INFY Industrial	Industrial	14°17'26.56"N120°59'21.20"E	Small
International British Academy	Institutional	14°20'48.20"N120°58'28.84"E	Small

Islamic Studies Call and Guidance Philippines	Institutional	14°21'3.88"N120°56'28.82"E	Small
J-EE Commercial Bldg. Shopping Mall	Commercial	14°21'14.38"N120°58'51.54"E	Small
Jabez Christian School	Institutional	14°17'41.89"N120°57'49.74"E	Micro
JACA Construction and Management	Commercial	14°21'11.08"N120°58'49.00"E	Micro
Jardine Resort and Restaurant	Commercial	14°20'41.89"N120°55'30.72"E	Small
Jesu Mari School	Institutional	14°19'28.30"N120°58'47.59"E	Small
Jesus Christ King of Kings Lord of Lords Foundation School	Institutional	14°19'47.74"N120°56'25.31"E	Small
Jesus Emmanuel School	Institutional	14°20'17.24"N120°57'6.41"E	Small
Jesus Son of Mary Academy	Institutional	14°20'2.64"N120°57'11.36"E	Small
Jesus The Gospel International	Institutional	14°21'7.14"N120°58'46.58"E	Small
Jollibee	Commercial	14°21'9.44"N120°58'51.35"E	Small
Jollibee	Commercial	14°19'13.73"N120°59'5.80"E	Small
Jose Rizal National Medical Center	Institutional	14°19'6.02"N120°57'49.40"E	Medium
Joyful Grace Academy	Institutional	14°20'59.52"N120°55'42.02"E	Micro
K and P Convertech Incorporated	Industrial	14°17'48.80"N120°59'32.14"E	Small
Kalipayan Resort	Commercial	14°20'29.95"N120°56'16.52"E	Small
Living World Academy	Institutional	14°18'40.31"N120°58'2.17"E	Small
LTO Dasmarinas Extension Office	Institutional	14°20'57.31"N120°55'24.86"E	Small
Magsaysay Institute of Shipping	Institutional	14°19'2.70"N120°57'2.81"E	Medium
Mahonri Academy and Science Highschool	Institutional	14°18'21.08"N120°59'14.52"E	Small
Marcbilt Construction Inc.	Industrial	14°18'8.26"N120°59'30.23"E	Small
Mariwasa Siam Ceramics Inc	Industrial	14°16'15.89"N120°57'58.51"E	Medium
Mary Auxilium Academy	Institutional	14°19'33.48"N120°58'39.91"E	Small
Mary Help of Christians School Inc.	Institutional	14°20'19.77"N120°56'8.82"E	Small
Mary Help Montessori School	Institutional	14°19'40.54"N120°56'21.57"E	Small
Mary Immaculate Parish	Institutional	14°20'56.30"N120°58'26.34"E	Micro
Masa Mart Business Center	Commercial	14°21'8.28"N120°58'38.38"E	Small
Max's Kitchen	Commercial	14°20'49.71"N120°56'13.71"E	Small
McDonald's	Commercial	14°19'34.90"N120°56'35.95"E	Small
Mercury Drug	Commercial	14°19'31.07"N120°56'25.63"E	Small

Michael Commercial Complex 1	Commercial	14°17'23.97"N120°59'21.92"E	Small
Motortrade Dasmarinas	Commercial	14°19'49.66"N120°56'20.70"E	Small
Mt Carmel School	Institutional	14°19'47.76"N120°58'42.38"E	Small
National College of Science and Technology	Institutional	14°19'9.29"N120°56'30.94"E	Small
New Era Elementary School	Institutional	14°16'47.32"N120°57'53.53"E	Small
Omega Ventures WL Trading Corporation	Industrial	14°17'21.11"N120°59'16.10"E	Large
Our Mother of Perpetual Help Parish	Institutional	14°20'3.90"N120°57'11.84"E	Micro
Paaralang Pangelementaryo ng Pitong Gubat	Institutional	14°19'19.35"N120°59'3.35"E	Small
Palapala Elementary School	Institutional	14°17'55.63"N120°57'21.30"E	Small
Paliparan Elementary School	Institutional	14°18'5.01"N120°59'35.92"E	Medium
Paliparan I Brgy Hall	Institutional	14°17'16.28"N120°59'12.19"E	Small
Paliparan National High School	Institutional	14°19'6.53"N120°58'56.22"E	Small
Paliparan Senior High School	Institutional	14°19'17.09"N120°58'45.25"E	Small
Palmas Del Sol Resort	Commercial	14°19'48.30"N120°56'30.10"E	Small
Philflex	Industrial	14°17'54.84"N120°57'58.98"E	Medium
Philippine Christian University	Institutional	14°17'28.50"N120°57'47.94"E	Medium
Piela Elementary School	Institutional	14°17'30.27"N120°58'28.99"E	Small
Pink Paradise Apartelle	Commercial	14°21'30.04"N120°56'15.93"E	Micro
Plainview Academy	Institutional	14°18'32.84"N120°58'6.50"E	Micro
Philippine Long Distance Telephone Company	Commercial	14°19'48.89"N120°56'20.71"E	Small
Philippine National Police Cavite Provincial Office	Institutional	14°18'49.19"N120°59'0.46"E	Medium
Poultry Breeder Farm	Commercial	14°15'11.36"N120°59'14.25"E	Small
Prosper Commercial Complex	Commercial	14°19'6.02"N120°59'6.75"E	Small
Public Market	Commercial	14°18'55.73"N120°57'28.95"E	Medium
Puregold Jr	Commercial	14°19'42.05"N120°56'0.95"E	Small
Puregold Paliparan	Commercial	14°19'12.11"N120°59'5.61"E	Medium
Puregold Zone IV	Commercial	14°19'37.15"N120°56'23.68"E	Medium
Qlick Café	Commercial	14°19'52.66"N120°57'29.64"E	Micro
Rajan Truck Movers Inc	Commercial	14°16'15.36"N120°57'59.73"E	Small

Ramona S. Tirona Memorial School	Institutional	14°18'49.68"N120°57'3.23"E	Medium
Recuerdo's Craft Int'l Co.	Industrial	14°21'24.34"N120°58'49.33"E	Micro
Rosario College of Business, Arts and Tourism	Institutional	14°17'59.64"N120°59'33.64"E	Small
Royal Cargo	Commercial	14°21'21.34"N120°56'5.35"E	Large
Sabang Barangay Hall	Institutional	14°20'52.19"N120°55'28.18"E	Small
Sabang Elementary School	Institutional	14°20'38.89"N120°55'34.89"E	Small
Sacred Heart Church	Institutional	14°19'6.69"N120°58'16.87"E	Micro
Saffron Philippines Inc.	Industrial	14°17'4.50"N120°59'22.70"E	Small
Saint Nicholas de Myra School	Institutional	14°19'35.99"N120°57'0.56"E	Micro
Saint Paul Hospital	Institutional	14°19'23.70"N120°57'46.97"E	Medium
Salawag Elementary School	Institutional	14°21'11.35"N120°58'50.79"E	Medium
Salitran Elementary School	Institutional	14°20'58.41"N120°56'26.68"E	Medium
Salitran II Barangay Hall	Institutional	14°21'1.55"N120°56'19.35"E	Small
Salugan Resort	Commercial	14°21'16.48"N120°58'45.60"E	Micro
San Miguel Elementary School	Institutional	14°20'18.52"N120°56'58.12"E	Small
San Miguel Warehouse	Commercial	14°16'18.59"N120°57'56.81"E	Small
San Miguel Yamamura Packaging Corporation	Industrial	14°21'46.44"N 120°56'11.42"E	Large
San Nicholas Elementary School	Institutional	14°18'54.34"N120°58'6.46"E	Small
Saniya Resort and Hotel	Commercial	14°20'53.75"N120°58'34.85"E	Small
Savemore Paliparan	Commercial	14°19'27.79"N120°59'3.01"E	Small
Savemore Salawag	Commercial	14°21'2.64"N120°58'49.86"E	Small
Savemore Salitran	Commercial	14°20'58.59"N120°56'17.64"E	Medium
SM Dasmarinas City	Commercial	14°18'4.89"N120°57'25.05"E	Large
SM Hypermarket	Commercial	14°19'40.96"N120°57'34.82"E	Medium
Small Public Market	Commercial	14°19'14.41"N120°59'0.54"E	Medium
St Jude College Dasmariñas	Institutional	14°20'33.18"N120°57'45.31"E	Medium
St. Paul College Island Park	Institutional	14°18'7.45"N120°58'57.85"E	Small
St. Peter Chanel School	Institutional	14°17'24.37"N120°58'35.72"E	Small
Sta Cruz Elementary School	Institutional	14°18'46.01"N120°57'38.75"E	Small
Stanley Electric Philippines Inc.	Commercial	14°16'9.77"N120°58'4.05"E	Small
Steel Force	Commercial	14°16'17.56"N120°57'57.20"E	Small

STI College	Institutional	14°19'49.52"N120°56'10.97"E	Small
Summit Windows and Industrial Sales Corp.	Industrial	14°21'16.28"N120°56'17.74"E	Small
Sun and Earth Corporation	Commercial	14°17'10.01"N120°59'21.72"E	Small
Sun Sonic Philippines	Industrial	14°17'33.48"N120°59'19.73"E	Medium
Sung-Yueh Const. Corp. (Pepsi, Decorall, national archive)	Industrial	14°17'30.78"N120°59'18.79"E	Medium
Sydenham Laboratories Inc.	Industrial	14°17'49.18"N120°57'23.70"E	Large
Technological University of the Philippines	Institutional	14°20'42.90"N120°57'57.56"E	Medium
TESDA Provincial Training Center	Institutional	14°18'10.55"N120°59'36.23"E	Small
Topaz Commercial Bldg.	Commercial	14°17'32.43"N120°57'29.41"E	Small
Toyota Salitran	Commercial	14°20'37.27"N120°56'16.61"E	Small
Tubigan Garden Resort	Commercial	14°19'7.90"N120°59'2.92"E	Small
Ultramega	Commercial	14°19'11.97"N120°59'2.88"E	Small
Union Theological Seminary	Institutional	14°17'33.09"N120°57'42.32"E	Small
United Graphic Expression Corporation	Industrial	14°17'19.27"N120°59'39.00"E	Small
Unitop	Commercial	14°17'14.24"N120°59'14.34"E	Medium
Unlad Garment Factory	Commercial	14°16'44.06"N120°57'59.09"E	Small
Vel Maris School	Institutional	14°20'4.18"N120°56'22.22"E	Small
Vista Mall	Commercial	14°19'0.32"N120°56'38.33"E	Medium
Waltermart	Commercial	14°19'31.28"N120°56'28.57"E	Medium
Wellcare Clinic and Laboratory Center	Institutional	14°19'36.96"N120°57'1.29"E	Micro
Wilcon Depot	Commercial	14°17'16.92"N120°59'19.57"E	Medium
Yakult Marketing Corporation	Commercial	14°17'6.97"N120°57'33.53"E	Large

Appendix Table 5. List of establishments classified as Micro, Small, Medium and Large Enterprises in Imus, City.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
7 Eleven	Commercial	14°24'48.54"N120°56'26.14"E	Micro
7 Eleven	Commercial	14°25'0.47"N120°56'5.92"E	Micro
7 Eleven	Commercial	14°23'30.46"N120°58'3.47"E	Micro
7 Eleven	Commercial	14°23'23.81"N120°56'23.50"E	Micro
Commercial Bldg.	Commercial	14°22'34.19"N120°56'19.79"E	Micro
7 Eleven	Commercial	14°24'23.09"N120°56'25.08"E	Micro
7 Eleven	Commercial	14°26'37.52"N120°55'26.46"E	Micro
Addi Crisostomo Flores Dental Clinic	Institutional	14°25'20.73"N120°56'28.57"E	Small
Aero Stone	Industrial	14°22'32.12"N120°57'0.73"E	Medium
Alfamart	Commercial	14°21'30.60"N120°55'35.25"E	Micro
Alfamart	Commercial	14°25'33.15"N120°56'19.44"E	Micro
Alfamart	Commercial	14°25'21.78"N120°56'32.89"E	Micro
Alfamart	Commercial	14°24'24.77"N120°56'6.49"E	Micro
Alfamart	Commercial	14°23'38.85"N120°56'25.86"E	Micro
Alfamart	Commercial	14°22'54.03"N120°56'31.75"E	Micro
Alfamart	Commercial	14°26'34.38"N120°55'26.57"E	Micro
Alfamart	Commercial	14°21'42.07"N120°55'42.11"E	Micro
Anabu Coastal Catholic Church	Institutional	14°22'36.25"N120°56'30.38"E	Micro
Anabu I Elementary School	Institutional	14°24'8.26"N120°56'26.06"E	Small
Anabu II Elementary School	Institutional	14°23'15.44"N120°56'23.90"E	Small
Anabu II-A Brgy Hall	Institutional	14°22'56.21"N120°56'12.59"E	Small
Anabu II-D Brgy Hall	Institutional	14°22'35.33"N120°56'33.78"E	Small
Anabu II-E Brgy Hall	Institutional	14°22'6.17"N120°56'26.02"E	Small
Annie's Candy Manufacturing Co.	Industrial	14°25'6.26"N120°56'55.11"E	Medium
Aristocrat	Commercial	14°22'31.06"N120°56'20.84"E	Small
Assignment Bar and Resto	Commercial	14°24'50.22"N120°56'27.80"E	Small
Astra Paper Corp.	Industrial	14°22'59.41"N120°57'37.26"E	Medium
Bahayang Pagasa Public Market	Commercial	14°23'48.54"N 120°58'6.06"E	Medium
Bayan Luma IV Brgy Hall	Institutional	14°24'47.05"N120°56'18.08"E	Small
Benedictine School of Learnings	Institutional	14°25'51.40"N14°25'51.40"N	Small
Bethany Bible Baptist Academy Cavite Inc.	Institutional	14°23'22.71"N 120°56'19.00"E	Small

BRBJ Trading and Construction Supply	Commercial	14°23'5.51"N 120°55'44.74"E	Small
Brgy Hall Anabu II-B	Institutional	14°23'7.49"N120°56'27.66"E	Small
Brgy Hall Anabu II-C	Institutional	14°22'48.48"N120°56'32.98"E	Small
Brgy Hall Anabu-I	Institutional	14°24'10.90"N120°56'29.19"E	Small
Brgy Hall Magdalo	Institutional	14°23'36.95"N120°57'49.21"E	Small
Buhay Na Tubig Elementary School	Institutional	14°24'0.50"N120°57'37.22"E	Medium
Buildsmart Home Supply Co.	Commercial	14°22'30.10"N 120°56'18.89"E	Small
Burger King	Commercial	14°22'31.36"N 120°56'18.95"E	Micro
Cafe Marcelo	Commercial	14°25'39.57"N 120°56'12.81"E	Micro
Caltex	Commercial	14°24'50.16"N 120°56'25.60"E	Micro
Camp General Panteleon Garcia	Institutional	14°25'47.47"N120°56'24.88"E	Medium
Candyline Food Manufacturing Corporation	Industrial	14°24'27.63"N120°56'38.29"E	Medium
Cavite Southern Topwell Marketing Corp.	Commercial	14°24'1.66"N120°56'26.32"E	Small
CAP College Imus	Institutional	14°25'28.62"N120°56'25.98"E	Small
Cavite De La Salle Institute	Institutional	14°25'5.35"N120°56'30.35"E	Small
Cayetano Topacio Elementary School	Institutional	14°25'35.37"N120°56'0.40"E	Medium
CBI Factories	Industrial	14°23'43.93"N120°56'17.23"E	Small
Chan C Bros, Inc.	Industrial	14°23'46.45"N120°56'9.57"E	Small
Chapter And Pages Corp.	Industrial	14°23'37.98"N120°56'33.04"E	Small
Chevrolet	Commercial	14°22'28.01"N 120°56'19.44"E	Small
Chowking	Commercial	14°24'19.06"N 120°56'24.85"E	Micro
Chowking	Commercial	14°22'31.90"N 120°56'18.89"E	Micro
CIG Bldg.	Commercial	14°26'18.77"N 120°55'46.57"E	Small
City Imus Doctors Hospital	Institutional	14°23'59.67"N120°56'21.47"E	Medium
City Mall	Commercial	14°23'54.78"N 120°56'22.30"E	Medium
CKL Industries	Industrial	14°25'20.85"N120°56'48.74"E	Small
Coca Cola FEMSA Philippines Imus Plant	Industrial	14°25'18.78"N 120°56'44.09"E	Large
Coffee Juan Miguel	Commercial	14°26'4.52"N 120°55'44.16"E	Micro
Commercial Bldg.	Commercial	14°26'18.77"N120°55'46.57"E	Small
Commercial Building	Commercial	14°24'23.33"N120°56'25.39"E	Small

Dairy Tech Candy	Industrial	14°25'1.06"N120°56'57.26"E	Medium
District Mall	Commercial	14°25'29.90"N 120°56'34.17"E	Medium
Don Roberto's Winery Corporation	Industrial	14°25'40.27"N120°56'15.95"E	Small
Double Tree Building	Industrial	14°24'3.29"N120°56'26.50"E	Small
Dr. Aillene Diolata (Clinic)	Institutional	14°25'17.06"N120°56'31.03"E	Micro
Eastman Industrial Supply Inc.	Industrial	14°23'46.69"N120°56'30.39"E	Small
Eds Manufacturing, Inc.	Industrial	14°23'6.83"N120°56'20.09"E	Small
El Camino CMW Inc	Industrial	14°25'21.63"N120°56'44.05"E	Small
Elizabeth Seton School	Institutional	14°22'32.91"N120°56'9.56"E	Small
Elufa Multi-Link Inc.	Industrial	14°23'45.00"N120°56'32.33"E	Small
Furniture Republic	Commercial	14°22'50.49"N120°56'21.98"E	Small
Gentro Manufacturing Inc.	Industrial	14°23'44.75"N120°56'35.35"E	Small
Golden City Food Market	Commercial	14°21'39.00"N 120°55'57.00"E	Small
GOV D.M Camerino Elementary School	Institutional	14°26'33.34"N120°55'27.20"E	Small
Gov Juanito Reyes Remulla High School	Institutional	14°26'27.44"N120°55'46.32"E	Small
Home Depot	Commercial	14°22'20.69"N 120°56'16.99"E	Small
Imus City Hall	Institutional	14°25'43.39"N120°56'10.03"E	Large
Imus Institute	Institutional	14°25'35.88"N120°56'15.86"E	Small
Imus Pilot Elementary School	Institutional	14°25'38.76"N120°56'21.42"E	Small
Imus Public Market	Commercial	14°25'21.88"N 120°56'28.54"E	Medium
Imus Unida Christian School	Institutional	14°25'46.98"N120°56'18.99"E	Small
Informatics College	Institutional	14°24'49.41"N120°56'27.74"E	Small
Informatics Computer Institute	Institutional	14°24'59.47"N120°56'28.28"E	Small
International British Academy	Institutional	14°22'26.68"N120°56'20.53"E	Small
Jollibee	Commercial	14°25'22.87"N 120°56'31.40"E	Small
Jollibee	Commercial	14°23'45.41"N 120°58'5.84"E	Small
Jollibee	Commercial	14°22'30.10"N 120°56'20.61"E	Small
Katedral Ng Imus	Institutional	14°25'45.14"N120°56'10.21"E	Micro
Katinko	Industrial	14°23'40.87"N120°56'39.10"E	Medium
Kingsway Stainless & Industrial Supply	Industrial	14°22'6.73"N120°56'20.50"E	Small

KFC	Commercial	14°22'33.64"N 120°56'19.75"E	Micro
Koastal Market	Commercial	14°22'32.10"N 120°56'21.11"E	Medium
Koldstor Centre Philippines Inc	Industrial	14°22'33.64"N 120°56'19.75"E	Large
Koldstor Main Office	Commercial	14°23'40.70"N120°56'42.01"E	Small
Lady Trinidad Academy	Institutional	14°24'39.69"N120°55'52.57"E	Small
Lazada Warehouse	Commercial	14°23'40.43"N 120°56'31.95"E	Small
Liwayway Marketing Corp.	Industrial	14°23'43.62"N120°56'11.34"E	Large
Lotus Mall	Commercial	14°25'25.08"N 120°56'24.21"E	Medium
Maharlika Barangay Hall	Institutional	14°23'47.32"N120°57'34.37"E	Small
Malagasang II Elementary School	Institutional	14°22'22.54"N120°55'41.70"E	Small
McDonald's	Commercial	14°25'30.50"N 120°56'23.72"E	Micro
Melloville Commercial Industrial Complex	Industrial	14°23'12.67"N120°56'25.11"E	Medium
Mercury Drugs	Commercial	14°25'15.42"N 120°56'28.17"E	Micro
Mercury Drugs	Commercial	14°24'9.81"N 120°56'24.39"E	Micro
Metal Steel Forming Corp.	Industrial	14°25'14.03"N120°56'50.37"E	Medium
Microbase Motor Bike Corporation	Industrial	14°24'0.30"N120°56'39.36"E	Small
Ministop	Commercial	14°26'37.21"N120°55'25.52"E	Micro
Montessori Professional College of Asia	Institutional	14°24'45.03"N120°56'22.12"E	Small
Motor Trade	Commercial	14°25'9.23"N 120°56'27.60"E	Small
Novel Furniture	Commercial	14°23'38.58"N 120°56'36.39"E	Small
Our Lady of Sacred Heart Parish	Institutional	14°23'0.33"N120°58'25.90"E	Micro
Our Lady of The Pilar Catholic School	Institutional	14°25'52.74"N120°56'16.00"E	Small
Our Lady of The Pillar Hospital	Institutional	14°25'8.99"N120°56'20.89"E	Medium
Pag-Ibig Fund	Institutional	14°25'17.55"N120°56'29.06"E	Small
Paredes Primary Care Center	Institutional	14°24'46.62"N120°56'26.35"E	Small
Pasong Buaya Elementary School	Institutional	14°22'25.84"N120°57'57.34"E	Small
Pasong Buwaya II Elementary School	Institutional	14°23'23.34"N120°57'53.35"E	Small
Pasong Santol Elementary School	Institutional	14°22'24.92"N120°56'28.77"E	Small
Patio Tirona Day Care Center	Institutional	14°21'41.91"N120°55'40.19"E	Small

Primarosa St. James Catholic Church	Institutional	14°24'26.56"N120°57'22.30"E	Micro
Puregold	Commercial	14°24'3.62"N 120°57'35.44"E	Small
Puregold	Commercial	14°21'40.00"N 120°55'59.32"E	Small
Puregold	Commercial	14°22'38.03"N 120°56'22.00"E	Small
Riverdale Confectionery Industry Incorporated	Industrial	14°23'40.64"N120°56'13.53"E	Small
Robinsons Place Imus	Commercial	14°24'46.77"N 120°56'31.16"E	Medium
Rover Heavy Vehicle Corp.	Commercial	14°23'32.96"N 120°56'24.82"E	Small
S&R Membership Shopping	Commercial	14°23'26.01"N 120°56'19.69"E	Small
Seaoil	Commercial	14°23'31.76"N 120°56'24.29"E	Micro
Shallow Tire Sales	Industrial	14°23'40.83"N120°56'37.02"E	Small
Shopwise	Commercial	14°22'34.30"N 120°56'21.31"E	Medium
SM Hypermarket Imus	Commercial	14°24'5.57"N 120°56'20.10"E	Medium
South Star Drug	Commercial	14°25'27.07"N 120°56'26.61"E	Micro
South Supermarket	Commercial	14°24'30.78"N 120°56'22.99"E	Medium
Southern Philippines Institute of Science and Technology	Institutional	14°23'12.21"N120°56'22.70"E	Small
St John Fisher School	Institutional	14°23'46.77"N120°57'46.15"E	Small
Sun City Commercial Bldg.	Commercial	14°24'16.52"N 120°56'24.10"E	Small
Tanzang Luma Elementary School	Institutional	14°24'55.12"N120°56'41.79"E	Small
The District Mall	Commercial	14°22'13.91"N 120°56'21.58"E	Medium
Tierra Santa Montessori School Inc.	Institutional	14°23'57.73"N120°56'29.45"E	Small
Toclong 2B Brgy Hall	Institutional	14°26'27.08"N120°55'46.27"E	Small
Toclong Elementary School	Institutional	14°26'17.76"N120°55'55.48"E	Small
Transport Automotive Sales Corp	Industrial	14°24'0.44"N120°56'37.55"E	Small
Ubana Plastic and Metal Fabrication	Industrial	14°22'26.88"N120°56'26.97"E	Small
Yazaki	Industrial	14°23'4.86"N120°56'15.59"E	Large

Appendix Table 6. List of establishments classified as Micro, Small, Medium and Large Enterprises in Bacoor, City.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
7-Eleven	Commercial	14°27'1.95"N 120°55'43.87"E	Micro
7-Eleven	Commercial	14°26'56.50"N 120°56'4.84"E	Micro
7-Eleven	Commercial	14°26'57.48"N 120°56'4.93"E	Micro
7-Eleven	Commercial	14°25'44.55"N 120°56'42.27"E	Micro
7-Eleven	Commercial	14°27'2.41"N 120°55'42.94"E	Micro
7-Eleven	Commercial	14°25'52.05"N120°56'47.01"E	Micro
7-Eleven	Commercial	14°26'43.11"N120°57'8.24"E	Micro
7-Eleven	Commercial	14°27'32.90"N120°56'26.30"E	Micro
7-Eleven	Commercial	14°26'14.46"N120°56'55.44"E	Micro
Abundant Life Church	Institutional	14°25'26.89"N120°57'45.83"E	Micro
ACTEC Bacoor	Institutional	14°26'14.84"N120°56'58.44"E	Small
Alfamart	Commercial	14°25'29.04"N120°56'43.73"E	Micro
Alfamart	Commercial	14°26'14.84"N 120°56'58.44"E	Micro
Alfamart	Commercial	14°22'18.52"N 120°58'46.75"E	Micro
Alfamart	Commercial	14°26'44.91"N 120°57'5.82"E	Micro
Alfamart - Rosewood	Commercial	14°26'27.26"N 120°57'48.46"E	Micro
All Day	Commercial	14°24'26.67"N 120°57'55.59"E	Micro
All Day	Commercial	14°25'52.63"N 120°57'53.59"E	Micro
All Home	Commercial	14°25'54.17"N 120°56'50.86"E	Small
All Home	Commercial	14°23'1.33"N 120°58'47.21"E	Small
Altaco Motor Corporation	Commercial	14°26'30.15"N120°57'5.72"E	Small
Andoks	Commercial	14°22'13.92"N 120°58'51.21"E	Micro
Ans Hardware	Commercial	14°26'52.44"N 120°56'30.65"E	Small
Army Navy	Commercial	14°25'46.55"N 120°56'44.38"E	Small
Asian Institute of Computer Studies	Institutional	14°26'34.21"N120°57'5.05"E	Small
Bacoor City Hall	Institutional	14°25'52.09"N120°58'5.48"E	Large
Bacoor Doctors Medical Center	Institutional	14°25'11.82"N120°58'3.61"E	Medium
Bacoor Parochial School of St. Michael the Archangel Inc.	Institutional	14°27'38.50"N120°56'33.78"E	Small
Bacoor Philippines Stake	Institutional	14°26'46.49"N120°56'48.00"E	Small
Balsahan Brgy Hall	Institutional	14°27'3.91"N120°55'34.15"E	Small
Banalo Brgy Hall	Institutional	14°27'29.27"N120°55'51.42"E	Small
Betoy's Restaurant	Commercial	14°27'1.14"N 120°55'50.06"E	Micro

Binakayan Doctors Mutlispecialty Clinic	Institutional	14°27'1.36"N120°55'41.97"E	Small
Binakayan Hospital and Medical Center	Institutional	14°27'6.07"N120°55'35.32"E	Medium
Binakayan New Cockpit	Commercial	14°27'26.11"N 120°55'34.54"E	Small
BPI Bacoor - Habay Branch	Commercial	14°26'47.01"N 120°56'58.94"E	Small
Barangay Hall Mambog IV	Institutional	14°25'21.49"N120°57'40.95"E	Small
Carlo Chino's Tapsihan	Commercial	14°27'34.03"N 120°56'26.34"E	Micro
Carmaxx HD Corporation	Industrial	14°26'58.38"N 120°57'40.90"E	Small
Casa De San Miguel Montessori	Institutional	14°27'9.34"N120°57'24.78"E	Small
Cavite Coliseum	Commercial	14°26'21.03"N 120°56'50.42"E	Small
Cavite State University - Imus Campus	Institutional	14°25'42.59"N120°56'49.16"E	Medium
Child Development and Guidance Center	Institutional	14°27'28.60"N120°55'24.74"E	Small
Chowking	Commercial	14°25'46.99"N 120°57'51.81"E	Small
Christian Values School	Institutional	14°26'24.03"N120°57'0.26"E	Small
Circle Island Resort	Commercial	14°23'12.99"N 120°58'36.93"E	Small
City Haus Trading	Commercial	14°24'58.76"N 120°57'59.28"E	Small
Civil Service Commission	Institutional	14°25'42.14"N120°56'44.78"E	Small
Commercial Building	Commercial	14°27'19.94"N 120°55'39.63"E	Small
Commercial Building	Commercial	14°22'22.96"N 120°58'49.23"E	Small
Commercial Building	Commercial	14°22'34.05"N 120°58'46.46"E	Small
Commercial Building	Commercial	14°27'17.37"N 120°55'37.43"E	Small
Commercial Building	Commercial	14°27'9.03"N 120°55'31.71"E	Small
Commercial Building	Commercial	14°26'55.88"N 120°56'7.88"E	Small
Commercial Building	Commercial	14°27'1.64"N 120°55'35.01"E	Small
Commercial Building	Commercial	14°27'2.55"N 120°55'42.35"E	Small
Commercial Building	Commercial	14°25'29.07"N 120°57'54.95"E	Small
Commercial Building	Commercial	14°27'30.14"N 120°55'27.67"E	Small
Commercial Building	Commercial	14°27'23.85"N 120°55'49.27"E	Small
Commercial Building	Commercial	14°27'13.79"N 120°57'24.24"E	Small
Commercial Building	Commercial	14°27'12.68"N 120°57'23.74"E	Small
Commercial Building	Commercial	14°27'11.55"N 120°57'24.43"E	Small
Commercial Building	Commercial	14°23'7.31"N 120°58'40.33"E	Small

Commercial Building	Commercial	14°23'5.98"N 120°58'40.50"E	Small
Commercial Building	Commercial	14°23'5.94"N 120°58'39.89"E	Small
Commercial Building	Commercial	14°24'5.81"N 120°58'4.15"E	Small
Commercial Building	Commercial	14°27'1.58"N 120°55'35.41"E	Small
Commercial Building	Commercial	14°27'2.35"N 120°55'34.24"E	Small
Crisostomo General Hospital	Institutional	14°26'57.42"N120°56'0.23"E	Small
DA Boss	Commercial	14°25'39.58"N 120°56'40.02"E	Small
Dan and Eve General Merchandise	Commercial	14°26'47.11"N 120°57'43.36"E	Small
Department of Environment and Natural Resources	Institutional	14°27'21.55"N120°55'40.53"E	Small
Deolus	Industrial	14°26'46.51"N 120°57'45.86"E	Medium
Disco Bar	Commercial	14°27'1.84"N 120°55'43.77"E	Small
Divine Jesus Learning Center	Institutional	14°23'45.84"N120°58'18.71"E	Small
Dolce Vita Baking Supply	Commercial	14°27'2.48"N 120°55'35.52"E	Micro
Donata Victoria Marketing	Commercial	14°26'24.70"N 120°57'49.18"E	Small
Dulong Bayan Barangay Hall	Institutional	14°26'57.90"N120°56'9.40"E	Small
Dulong Bayan Elementary School	Institutional	14°26'59.07"N120°56'8.63"E	Small
Dulong Bayan Senior High School	Institutional	14°27'0.04"N120°56'6.45"E	Small
E-Bingo Boutique	Commercial	14°26'21.60"N 120°56'55.01"E	Micro
Emilu's	Commercial	14°23'42.78"N 120°58'38.21"E	Medium
Escuela La Madrid of Cavite	Commercial	14°27'0.23"N120°55'44.07"E	Small
Explorer Freight Corporation	Industrial	14°26'32.33"N 120°57'56.03"E	Small
Farmacia ni Dok	Commercial	14°27'3.12"N 120°55'34.51"E	Micro
Flying V	Commercial	14°22'30.15"N 120°58'47.43"E	Small
Furniture Shop	Commercial	14°27'2.50"N 120°55'35.98"E	Small
Gandia's Garden	Commercial	14°27'9.33"N 120°55'34.30"E	Small
General Aguinaldo High School	Institutional	14°25'39.52"N120°56'46.77"E	Medium
Generica Drug Store	Commercial	14°27'34.05"N 120°56'25.91"E	Small
Global Integrity Freight	Industrial	14°26'38.78"N 120°57'48.05"E	Small
Globe Telecom	Commercial	14°26'52.65"N 120°56'21.75"E	Medium
Golden Oasys Hotel	Commercial	14°23'3.77"N 120°58'42.11"E	Small
Gospel Light Christian Academe	Institutional	14°25'57.19"N120°56'45.88"E	Small

Green Horizon Environmental Management Inc	Industrial	14°26'45.69"N 120°57'44.20"E	Small
Habay Construction supply	Commercial	14°26'51.26"N 120°56'29.75"E	Micro
Habay Elementary School	Institutional	14°26'55.01"N120°56'38.78"E	Small
Habay II Brgy Hall	Institutional	14°26'41.44"N120°56'53.92"E	Small
Harrelle Horne Integrated School	Institutional	14°23'53.26"N120°58'27.01"E	Small
Hidden Tapsihan	Commercial	14°26'58.51"N 120°55'59.49"E	Micro
HR Backyard Body Kits Car Parts & Accessories	Commercial	14°26'47.58"N 120°56'58.11"E	Micro
Iglesia Ni Cristo	Institutional	14°26'30.90"N120°56'3.44"E	Small
Iglesia Ni Cristo	Institutional	14°27'33.83"N120°56'49.58"E	Small
Iglesia Ni Cristo	Institutional	14°23'54.34"N120°58'37.02"E	Small
Iglesia Ni Cristo - Lokal ng Habay	Institutional	14°26'51.75"N120°56'38.18"E	Micro
Immanuel Grace Learning School	Institutional	14°27'5.83"N120°57'22.45"E	Micro
Imus Family Hospital	Institutional	14°25'57.16"N120°56'46.65"E	Small
Imus Medical Center	Institutional	14°25'34.61"N120°56'47.34"E	Medium
Intelek Quest Management Consultancy Services	Commercial	14°25'40.32"N 120°56'40.06"E	Small
International School for Hotel and Restaurant Management	Institutional	14°26'53.02"N120°56'28.36"E	Small
Interworld Plastic Manufacturing Corp.	Industrial	14°26'42.27"N 120°57'47.53"E	Small
J&T Express	Commercial	14°26'45.68"N 120°57'46.20"E	Small
Japanese Restaurant	Commercial	14°27'10.00"N 120°55'33.03"E	Small
Jaytee Gases Inc.	Industrial	14°26'40.02"N 120°57'45.61"E	Small
Jesus Good Shepherd School	Institutional	14°25'45.17"N120°56'35.22"E	Small
Jesus Miracle Crusade International Ministry	Institutional	14°24'52.72"N120°58'4.41"E	Small
JNM Printing Services and Supplies	Commercial	14°26'45.64"N 120°57'4.86"E	Micro
Jose Torres Medical Laboratory Services and Diagnostic Center	Institutional	14°27'13.29"N120°57'25.22"E	Micro
Joseph Immanuel School	Institutional	14°25'54.18"N120°57'2.46"E	Small
Kainan sa Balsa	Commercial	14°27'20.02"N 120°55'49.67"E	Small
Kali Philmarketing Corporation	Industrial	14°25'22.48"N 120°57'6.34"E	Medium
Kane Industrial Corporation	Industrial	14°26'58.12"N 120°57'45.06"E	Medium

Kia Motors	Commercial	14°23'13.13"N 120°58'29.86"E	Small
King James Academy	Institutional	14°25'22.98"N120°56'59.44"E	Small
King Solomon Integrated School	Institutional	14°25'25.47"N120°57'37.96"E	Small
Kumpares	Commercial	14°25'4.04"N 120°58'1.57"E	Micro
La Camelle School	Institutional	14°26'16.10"N120°56'44.28"E	Small
La Vivienda	Commercial	14°26'52.17"N 120°57'40.31"E	Small
Light House Science High School	Institutional	14°25'52.32"N120°56'44.24"E	Small
Likha Elementary School	Institutional	14°22'53.80"N120°58'34.71"E	Small
LTO Imus Office	Institutional	14°25'47.08"N120°56'50.71"E	Small
Lucky 666 Hardware and Construction Supply	Commercial	14°22'32.15"N 120°58'46.98"E	Small
Lucky Sun Construction Supply	Commercial	14°27'2.91"N 120°55'37.92"E	Small
Mabolo Elementary School	Institutional	14°27'5.85"N120°55'44.71"E	Small
Mabolo I Barangay Hall	Institutional	14°27'9.20"N120°55'47.67"E	Small
Mabolo II Barangay Hall	Institutional	14°27'0.05"N120°55'41.41"E	Small
Mabolo II Brgy Hall	Institutional	14°27'9.18"N120°56'2.72"E	Small
Main Square	Commercial	14°25'38.51"N 120°57'53.06"E	Small
Mambog III Brgy Hall	Institutional	14°25'22.07"N120°57'30.78"E	Small
Mambog Elementary School	Institutional	14°25'22.67"N120°57'29.61"E	Small
Mambog II Brgy Hall	Institutional	14°25'27.43"N120°57'5.19"E	Small
Mambog Talipapa	Commercial	14°25'21.05"N 120°57'45.63"E	Small
Maneki Neko Trading	Commercial	14°26'51.63"N 120°56'28.88"E	Small
Manitowoc Crane Grp. Inc. Yard	Industrial	14°22'7.34"N 120°58'44.15"E	Medium
MAPTCO	Industrial	14°26'16.28"N 120°57'54.72"E	Medium
Marella Christianne Institute Bacoor	Institutional	14°26'40.99"N120°56'0.68"E	Small
Marina Hotel	Commercial	14°26'48.58"N 120°57'7.27"E	Small
Marvelous Faith Academy	Institutional	14°25'25.03"N120°57'43.25"E	Small
Mary Homes People's Pharmacy	Commercial	14°22'22.39"N 120°58'47.30"E	Micro
Max's	Commercial	14°25'39.09"N 120°57'50.48"E	Small
Maynilad	Commercial	14°25'58.55"N 120°56'50.45"E	Medium
Mc Lane Storage Facilities	Commercial	14°26'27.26"N 120°57'48.00"E	Small
McDonalds	Commercial	14°25'43.46"N 120°56'41.52"E	Small

McDonalds	Commercial	14°23'53.27"N 120°58'37.64"E	Small
Meralco	Commercial	14°26'37.43"N 120°57'8.81"E	Small
Mercury Drug	Commercial	14°26'45.27"N 120°57'4.18"E	Micro
Mercury Drug	Commercial	14°23'54.07"N 120°58'36.18"E	Micro
Metal Link	Commercial	14°26'51.31"N 120°57'49.65"E	Small
Metalman Steel Forming Corporation	Industrial	14°25'14.96"N 120°56'52.48"E	Medium
Metro South Medical Center	Institutional	14°22'25.44"N120°58'47.25"E	Medium
MGS Ready Mix Inc - Bacoor	Commercial	14°25'3.81"N 120°58'7.12"E	Medium
Migz Binalot	Commercial	14°25'32.79"N 120°57'54.26"E	Micro
Millenium Christian Highschool of Cavite	Institutional	14°26'51.47"N120°56'28.10"E	Small
Ministop	Commercial	14°27'4.57"N 120°57'19.97"E	Micro
Ministop	Commercial	14°23'8.43"N 120°58'39.84"E	Micro
Mitsubishi Motors	Commercial	14°25'32.24"N 120°57'52.71"E	Small
Mix n' Pack Philippines Inc.	Industrial	14°27'0.17"N 120°56'4.88"E	Small
Molino Elementary School	Institutional	14°23'50.45"N120°58'38.65"E	Small
Montessori Professional College	Institutional	14°26'47.26"N120°56'46.14"E	Small
Mordic Strong Ice	Industrial	14°26'21.74"N 120°56'57.49"E	Small
Motor Central	Commercial	14°27'1.50"N120°55'30.22"E	Small
Mother of Christ Montessori Integrated School	Institutional	14°25'7.18"N120°57'14.44"E	Small
Nature's Spring	Commercial	14°26'59.46"N 120°56'4.89"E	Small
NFAF Marketing Services	Commercial	14°26'56.98"N 120°57'39.76"E	Small
NVM Commercial Corp	Commercial	14°26'43.16"N 120°57'45.08"E	Small
OEM Steel Fastener Inc	Industrial	14°26'12.93"N 120°57'55.00"E	Medium
One Seranata Hotel	Commercial	14°26'57.39"N 120°55'57.30"E	Small
Our Lady of Lourdes Academy of Bacoor Cavite Inc.	Institutional	14°25'17.24"N120°57'41.33"E	Small
Our Lady of Fatima Academy of Binakayan, Inc.	Institutional	14°27'13.86"N 120°55'29.25"E	Small
Our Mother of Perpetual Help Chapel	Institutional	14°25'44.61"N120°56'58.82"E	Micro
Padi's Point	Commercial	14°26'47.85"N 120°57'11.73"E	Small
Palico Elementary School	Institutional	14°25'39.29"N120°56'51.22"E	Small
Panapaan Brgy Hall	Institutional	14°27'22.59"N120°57'10.53"E	Small
Panapaan I Brgy Hall	Institutional	14°26'53.71"N120°57'20.43"E	Small
Panapaan II Brgy Hall	Institutional	14°27'9.22"N120°57'20.34"E	Small

Panapaan IV Brgy Hall	Institutional	14°27'7.91"N120°57'19.30"E	Small
Panapaan VI Brgy Hall	Institutional	14°26'31.31"N120°57'7.25"E	Small
Panapaan VIII Brgy Hall	Institutional	14°26'13.59"N120°57'14.27"E	Small
Paradiso Terrestre	Commercial	14°22'42.08"N 120°58'43.84"E	Small
Pelican Bleu Bar and Restaurant	Commercial	14°27'12.02"N 120°55'34.92"E	Small
Petron	Commercial	14°22'59.48"N 120°58'42.91"E	Small
Philippine School of Business Administration	Institutional	14°27'11.55"N120°57'23.04"E	Small
Phoenix	Commercial	14°25'48.55"N 120°57'53.28"E	Small
Phoenix	Commercial	14°23'8.43"N 120°58'39.00"E	Small
PLDT	Commercial	14°26'55.30"N120°55'29.56"E	Small
Pizza Hut	Commercial	14°26'46.81"N 120°57'13.40"E	Small
PRB Bldg.	Commercial	14°25'47.55"N 120°56'44.79"E	Small
Prime Pacific Business Center	Commercial	14°26'34.07"N 120°57'47.32"E	Small
Public Market	Commercial	14°25'25.44"N 120°57'52.60"E	Small
Puregold Bacoor	Commercial	14°26'48.88"N 120°57'14.62"E	Small
Puregold Habay	Commercial	14°26'20.19"N 120°56'56.78"E	Small
QLE Inn	Commercial	14°26'55.45"N 120°56'0.64"E	Small
Quest Academy	Institutional	14°26'34.53"NC120°56'1.81"E	Micro
R.C Torreno Hardware	Commercial	14°25'50.38"N 120°56'46.31"E	Small
Real 1 Barangay Hall	Institutional	14°25'58.90"N120°56'25.02"E	Small
Real Elementary School	Institutional	14°26'0.11"N120°56'22.43"E	Small
Real II Brgy Hall	Institutional	14°26'8.36"N120°57'10.97"E	Small
Regasco-Molino Plant	Industrial	14°26'55.25"N 120°57'47.74"E	Medium
Restaurant (small)	Commercial	14°27'1.50"N 120°55'44.91"E	Small
Revilla Business Park	Commercial	14°26'18.58"N 120°56'51.56"E	Small
Robinson's Townville	Commercial	14°24'42.20"N 120°57'10.26"E	Small
Ruther E. Esconde School of Intelligence Inc.	Institutional	14°26'57.05"N120°56'6.62"E	Small
Sachon Asian Restaurant	Commercial	14°25'50.86"N 120°56'46.32"E	Small
Salinas Elementary School	Institutional	14°26'23.62"N120°56'9.36"E	Small
Salinas I Brgy Hall	Institutional	14°26'24.11"N120°56'7.95"E	Small
Salinas III Brgy Hall	Institutional	14°26'13.32"N120°56'43.47"E	Small
San Felipe	Industrial	14°26'52.91"N 120°57'49.22"E	Small

San Miguel Beer Warehouse - Bacoor	Commercial	14°26'53.04"N 120°56'41.80"E	Small
Savemore Market	Commercial	14°23'46.53"N 120°58'15.27"E	Small
School of St Mark	Institutional	14°26'40.09"N120°57'11.28"E	Small
Seaking Commercial	Commercial	14°26'35.00"N 120°57'49.24"E	Small
Seaoil Gasoline Station	Commercial	14°25'13.52"N 120°58'0.05"E	Small
Seaoil Gasoline Station	Commercial	14°27'8.98"N 120°55'32.70"E	Small
Seed of Wisdom Learning Center	Institutional	14°26'46.28"N120°55'54.41"E	Micro
Seven Seas Academy	Institutional	14°25'5.49"N120°57'4.81"E	Micro
Shakey's	Commercial	14°23'8.50"N 120°58'39.10"E	Small
Shell Gasoline Station	Commercial	14°26'1.57"N 120°56'51.69"E	Small
Shell Gasoline Station	Commercial	14°25'7.00"N 120°58'3.64"E	Small
Sidewalk Fud Hub	Commercial	14°26'50.82"N 120°57'44.41"E	Micro
Sinegeulasan Elementary School	Institutional	14°27'33.05"N120°55'37.41"E	Small
Sinugba atbp.	Commercial	14°22'13.75"N 120°58'50.09"E	Small
Skypro Construction & Supply	Commercial	14°26'8.00"N 120°57'51.84"E	Small
SM Bacoor	Commercial	14°26'40.81"N 120°57'2.74"E	Large
SM Molino	Commercial	14°23'1.32"N 120°58'38.04"E	Large
Southlink Transport Corp	Commercial	14°26'47.96"N 120°57'45.29"E	Small
Sparkle S3 Motel	Commercial	14°27'1.57"N 120°55'44.57"E	Small
St Jerome Emilliani Institute	Institutional	14°23'52.80"N120°58'20.85"E	Small
St Jude Thaddeus the Apostle Pastoral Center	Institutional	14°25'18.77"N120°57'43.45"E	Small
St. Michael School of Cavite	Institutional	14°23'11.50"N120°58'29.31"E	Small
St Peregrine Institutional	Institutional	14°27'18.04"N120°55'46.76"E	Small
St. Emilene Academe	Institutional	14°25'55.80"N120°56'14.65"E	Small
St. Rose Learning School	Institutional	14°25'51.51"N120°56'34.26"E	Small
St. Thomas More Academy High School	Institutional	14°23'55.54"N120°58'31.41"E	Small
St. Vincent de Paul College Inc.	Institutional	14°26'18.79"N120°57'49.87"E	Small
St. Michael the Archangel Parish	Institutional	14°27'34.95"N120°56'23.20"E	Small
Star Honda Inc.	Commercial	14°25'41.57"N 120°56'42.07"E	Small
Statefields School	Institutional	14°23'32.51"N120°58'35.84"E	Medium
Steelzone Corporation	Industrial	14°24'46.75"N 120°58'6.30"E	Small
Stickerworld	Industrial	14°26'53.79"N 120°57'42.25"E	Medium

Stonerich Staging	Industrial	14°25'57.22"N 120°57'54.57"E	Medium
Tendi Industries Cabinet	Industrial	14°22'49.91"N 120°58'47.17"E	Small
The Church of Jesus Christ of Latter Saints	Institutional	14°23'54.65"N120°58'32.39"E	Micro
The Palmridge School	Institutional	14°24'27.63"N120°57'53.28"E	Small
Theresian School of Cavite	Institutional	14°26'52.81"N120°56'44.83"E	Small
Tetrabites Restobar	Commercial	14°27'2.72"N 120°55'37.28"E	Small
Tirona's Grill and Restaurant	Commercial	14°26'56.88"N 120°56'3.61"E	Micro
Toprigid Metal Corporation	Industrial	14°26'48.65"N 120°57'44.57"E	Medium
Total Gasoline Station	Commercial	14°22'19.69"N 120°58'50.43"E	Micro
Toyota	Commercial	14°25'36.71"N 120°57'50.81"E	Small
Trends and Technologies Inc.	Industrial	14°26'28.84"N 120°57'49.90"E	Small
Unison Motor Corp	Commercial	14°25'7.17"N 120°57'59.81"E	Small
University of Perpetual Help System Dalta	Institutional	14°23'44.28"N120°58'34.28"E	Medium
RBT Commercial Bldg.	Commercial	14°27'0.40"N 120°55'51.35"E	Small
USA 88 Gasoline Station	Commercial	14°22'45.67"N 120°58'43.49"E	Small
V. M. Espiritu Construction	Commercial	14°26'57.43"N 120°55'52.39"E	Small
Veal Burger	Commercial	14°22'39.47"N 120°58'46.39"E	Small
VEE KEE Marketing	Commercial	14°26'43.31"N 120°57'47.07"E	Small
Vertical Space Interior	Commercial	14°26'45.10"N 120°57'46.63"E	Small
Victorious Christian Montessori College	Institutional	14°25'47.38"N120°56'53.92"E	Small
Villa Teresita Swimming Pool	Commercial	14°26'33.06"N 120°55'54.88"E	Small
Vista Mall	Commercial	14°23'5.43"N 120°58'44.35"E	Medium
Wilcon Depot	Commercial	14°24'38.33"N 120°58'6.72"E	Small
Yama - Keen Homewares Shop	Commercial	14°27'0.45"N 120°55'50.48"E	Small
Yellow Cab	Commercial	14°25'41.69"N 120°56'40.73"E	Small

Appendix Table 7. List of establishments classified as Micro, Small, Medium and Large Enterprises in Kawit Cavite.

ESTABLISHMENTS	CATEGORY	COORDINATES	BUSINESS CATEGORY
7 Eleven	Commercial	14°26'59.01"N120°55'23.86"E	Small
735 Veranda Grill & Sizzling House	Commercial	14°27'20.56"N120°55'38.83"E	Small
Alfamart	Commercial	14°26'57.65"N120°55'16.11"E	Micro
Andoks	Commercial	14°27'0.27"N120°55'25.40"E	Micro
Bautista Arcade Commercial Bldg.	Commercial	14°26'58.27"N120°55'17.52"E	Small
Bank of the Philippines Island	Commercial	14°27'0.09"N 120°55'23.80"E	Small
Banko de Oro	Commercial	14°26'57.31"N120°55'17.09"E	Small
Binakayan Elementary School	Institutional	14°27'4.86"N120°55'21.24"E	Small
Binakayan Kanluran Brgy Hall	Institutional	14°26'53.06"N120°55'1.72"E	Small
Binakayan National High School	Institutional	14°27'26.87"N120°55'18.08"E	Small
Blessed Word Church Kawit	Institutional	14°26'53.06"N120°55'26.57"E	Small
Binakayan Public Market	Commercial	14°26'54.20"N120°55'17.04"E	Medium
Chefgyeopsal	Commercial	14°27'19.98"N120°55'39.65"E	Micro
Citi Care Ultrasound Services and Diagnostic	Institutional	14°26'56.7"N120°55'14.97"E	Small
Commercial Building	Commercial	14°26'56.79"N120°55'24.69"E	Micro
Emilu's	Commercial	14°26'59.24"N120°55'25.61"E	Small
First Orient International Ventures Corporation	Industrial	14°27'34.24"N120°55'18.79"E	Large
Flying V	Commercial	14°26'56.38"N120°55'10.66"E	Small
Fresh Options	Commercial	14°26'57.51"N120°55'24.40"E	Small
Glasteel	Industrial	14°27'16.06"N120°55'35.76"E	Small
Huge Cart the Grocery Store	Industrial	14°27'40.39"N 120°55'8.57"E	Small
Iglesia Ni Cristo	Institutional	14°27'30.76"N120°55'16.75"E	Micro
Jamir EENT Clinic	Commercial	14°26'54.34"N 120°55'4.50"E	Micro
Joy-Joy Pet shop	Commercial	14°27'2.00"N120°55'37.37"E	Micro
Malvar's Supermart	Commercial	14°27'2.18"N 120°55'30.55"E	Small
Massway Dept store	Commercial	14°26'58.21"N120°55'16.79"E	Small
Massway Supermarket	Commercial	14°26'57.84"N120°55'20.24"E	Small

Mechatrends Contractors Corporation	Industrial	14°26'47.62"N120°55'24.71"E	Medium
Mercury Drug	Commercial	14°27'0.84"N 120°55'24.30"E	Small
Open Mic Bar	Commercial	14°27'20.13"N120°55'39.84"E	Small
Philippine Long Distance Telephone Company	Commercial	14°26'55.23"N120°55'29.59"E	Medium
Rizal Commercial Banking	Commercial	14°26'57.21"N120°55'16.81"E	Small
Rilbest Container Yard Inc.	Industrial	14°27'29.79"N120°55'12.06"E	Small
Southstar Drug	Commercial	14°26'59.91"N120°55'22.88"E	Small
Tramo Elementary School	Institutional	14°26'46.17"N120°54'58.28"E	Small
U Mart Shopping Center	Commercial	14°26'57.42"N120°55'23.24"E	Small
Unitech Gree Philippines	Commercial	14°27'36.65"N120°55'13.76"E	Small
Ylang-Ylang Inn	Commercial	14°27'25.36"N120°55'36.17"E	Micro
Zenaida H. Gana Commercial Complex	Commercial	14°26'58.38"N120°55'20.81"E	Small

Appendix Table 8. Total number of business enterprises per Municipality/City.

Municipality/City	Business Enterprises			
	Commercial	Institutional	Industrial	TOTAL
Tagaytay	19	10	0	29
Amadeo	9	0	2	11
Silang	36	24	17	77
Dasmariñas	87	94	20	201
Imus	65	28	52	145
Bacoor	155	98	23	276
Kawit	27	7	5	39
TOTAL	**398**	**261**	**119**	**778**

Appendix Table 9. Classification of business enterprises per Municipality/City.

Municipality/City	Classification of Business Enterprises				
	Micro	Small	Medium	Large	TOTAL
Tagaytay	12	16	1	0	29
Amadeo	8	2	2	0	11
Silang	24	39	13	1	77
Dasmariñas	43	111	41	6	201
Imus	34	83	23	5	145
Bacoor	45	203	25	3	276
Kawit	8	27	3	1	39
TOTAL	**174**	**471**	**108**	**16**	**778**

Appendix Table 10. Categories and definition of the different business enterprises.

Type of Enterprise	Definition
Micro	Business less than 9 employees
Small	Business with 9 to 49 employees
Medium	Business with 49 to 249 employees
Large	Business or a company having 249 or more employees.

Appendix Table 11. Waste Storage Facilities in the Imus River Watershed.

Municipality/City	Waste Storage Facilities			
	MRR	MRF	Sanitary Landfill	TOTAL
Tagaytay	0	2	0	2
Amadeo	0	1	0	1
Silang	7	2	1	10
Dasmariñas	8	1	1	11
Imus	0	3	0	3
Bacoor	14	7	0	21
Kawit	6	1	0	7
TOTAL	**35**	**16**	**2**	**55**

Appendix Table 12. Location, category and coordinates of Material Recovery Facility and Material Recovery Receptacle within the City of Tagaytay.

BARANGAY	CATEGORY	COORDINATES
Silang Crossing West	MRF	14° 6'17.23"N120°57'2.34"E
Silang Junction North	MRF	14° 6'41.02"N120°57'10.78"E

Appendix Table 13. Location, category and coordinates of Material Recovery Facility within the Municipality of Amadeo.

BARANGAY	CATEGORY	COORDINATES
Buho	MRF	14° 8'5.19"N120°57'3.77"E

Appendix Table 14. Location, category and coordinates of Material Recovery Facility, Material Recovery Receptacle and Sanitary Landfill within the Municipality of Silang.

BARANGAY	CATEGORY	COORDINATES
Balite 2nd	MRF	14°11'3.32"N120°58'23.36"E
Barangay II	MRR	14°13'16.89"N120°58'27.10"E
Iba	MRF	14°13'3.71"N120°58'39.06"E
Lalaan I (Brgy. Hall)	MRR	14°11'15.50"N120°57'44.82"E
Lalaan I	Sanitary Landfill	14°12'23.19"N120°58'19.69"E
Lalaan II	MRR	14° 9'29.72"N120°57'28.99"E
Mataas na Burol	MRR	14° 9'59.84"N120°58'19.02"E
Toledo	MRR	14° 9'13.49"N120°57'52.97"E
Tubuan I	MRR	14°12'51.60"N120°58'15.56"E
Tubuan III	MRR	14°13'3.73"N120°58'18.33"E

Appendix Table 15. Location, category and coordinates of Material Recovery Facility, Material Recovery Receptacle and Sanitary Landfill within the City of Dasmariñas.

BARANGAY	CATEGORY	COORDINATES
Burol Main	MRR	14°19'45.76"N120°56'56.66"E
Burol I	MRR	14°19'34.22"N120°57'45.37"E
Luzviminda II	MRF	14°18'35.10"N120°58'10.82"E
Paliparan III	MRR	14°18'48.30"N120°59'1.72"E
Salawag	Sanitary Landfill	14°21'17.51"N120°59'15.29"E
Sampaloc II	MRR	14°17'0.12"N120°57'36.87"E
San Antonio De Padua I	MRR	14°19'7.61"N120°57'25.59"E
San Manuel II	MRR	14°20'7.84"N120°57'5.35"E
Sultan Esmael	MRR	14°20'2.16"N120°57'30.58"E
Zone I	MRR	14°19'49.96"N120°56'5.22"E

Appendix Table 16. Location, category and coordinates of Material Recovery Facility and Material Recovery Receptacle within the City of Imus.

BARANGAY	CATEGORY	COORDINATES
Buhay na Tubig	Waste Ecology Center	14°25'12.62"N120°56'57.25"E
Magdalo	MRF	14°23'43.82"N120°57'35.67"E
Mariano Espeleta I	MRF	14°23'52.46"N120°58'4.79"E
Pinagbuklod	MRF	14°23'41.85"N120°57'44.96"E

Appendix Table 17. Location, category and coordinates of Material Recovery Facility and Material Recovery Receptacle within the City of Bacoor.

BARANGAY	CATEGORY	COORDINATES
Alima	MRR	14°27'24.81"N120°56'3.79"E
Banalo	MRR	14°27'29.54"N120°55'52.35"E
Dulong Bayan	MRR	14°26'58.44"N120°56'9.35"E
Habay I	MRR	14°27'3.07"N120°56'35.82"E
Habay II	MRR	14°26'41.31"N120°56'53.93"E
Mabolo I	MRR	14°27'9.08"N 120°55'47.63"E
Mabolo II	MRR	14°27'9.36"N120°56'2.96"E
Mabolo III	MRF	14°26'59.43"N120°55'41.58"E
Mambog I	MRR	14°25'16.75"N120°57'0.15"E
Mambog II	MRF	14°25'27.23"N120°57'5.58"E
Mambog IV	MRR	14°25'21.69"N120°57'41.13"E
Mambog V	MRF	14°25'50.76"N120°56'57.30"E
Molino III	MRF	14°23'56.02"N120°58'41.13"E
Molino IV	MRR	14°22'17.06"N120°58'51.70"E
Molino V	MRF	14°23'58.02"N120°58'4.71"E
Real I	MRR	14°26'7.79"N120°57'10.79"E
Real II	MRR	14°26'42.36"N120°55'54.06"E

Salinas I	MRF	14°26'41.91"N120°55'53.67"E
Salinas II	MRR	14°26'16.06"N120°56'48.00"E
Salinas III	MRF	14°26'13.29"N120°56'42.75"E
Tabing Dagat	MRR	14°27'39.03"N120°56'24.09"E

Appendix Table 18. Location, category and coordinates of Material Recovery Facilityand Material Recovery Receptacle within the Municipality of Kawit.

BARANGAY	CATEGORY	COORDINATES
Balsahan-Bisita	MRR	14°27'2.89"N120°55'33.01"E
Binakayan-Aplaya	MRF	14°26'57.33"N120°55'3.42"E
Binakayan-Kanluran	MRR	14°26'57.86"N120°55'3.75"E
Congbalay-Legaspi	MRR	14°27'18.97"N120°55'11.97"E
Manggahan-Lawin	MRR	14°26'44.86"N120°55'43.58"E
Pulvorista	MRR	14°27'31.53"N120°55'26.23"E
Samala-Marquez	MRR	14°27'16.24"N120°55'10.83"E

Appendix Table 19. 7-day waste characterization profile.

Sampling Site	Household Number	Total Plastic Generation per Household (kg)	Average Plastic Generation per Household (Kg/day)	Average Plastic Generation per Capita (kg/day)
A	1	1.30	0.19	0.05
A	2	0.73	0.10	0.02
A	3	0.80	0.11	0.03
A	4	0.33	0.05	0.01
A	5	0.60	0.09	0.02
A	6	1.20	0.17	0.04
A	7	1.20	0.17	0.04
A	8	0.83	0.12	0.03
A	9	0.95	0.14	0.03
A	10	2.60	0.37	0.09
A	11	1.45	0.21	0.05
A	12	0.73	0.10	0.02
A	13	2.50	0.36	0.09
A	14	2.70	0.39	0.10
A	15	2.50	0.36	0.09
A	16	3.20	0.46	0.11
A	17	0.67	0.10	0.02
A	18	3.25	0.46	0.11
A	19	2.08	0.30	0.07
A	20	9.75	1.39	0.34
A	21	2.55	0.36	0.09
A	22	0.52	0.07	0.02
A	23	1.00	0.14	0.03
A	24	1.05	0.15	0.04
A	25	0.90	0.13	0.03
A	26	0.36	0.05	0.01
A	27	0.88	0.13	0.03
A	28	0.48	0.07	0.02
A	29	0.58	0.08	0.02
A	30	0.65	0.09	0.02
A	31	0.46	0.07	0.02
A	32	0.55	0.08	0.02
A	33	2.60	0.37	0.09
A	34	1.40	0.20	0.05
A	35	2.80	0.40	0.10
A	36	2.60	0.37	0.09
A	37	1.90	0.28	0.07
A	38	2.40	0.34	0.08
A	39	0.66	0.09	0.02
A	40	0.86	0.12	0.03
A	41	0.36	0.05	0.01

A	42	0.46	0.07	0.02
A	43	1.35	0.19	0.05
A	44	0.28	0.04	0.01
A	45	0.43	0.06	0.01
A	46	0.68	0.10	0.02
A	47	2.50	0.36	0.09
A	48	0.90	0.13	0.03
A	49	0.38	0.05	0.01
A	50	0.45	0.06	0.01
A	51	1.10	0.16	0.04
A	52	0.36	0.05	0.01
A	53	0.36	0.05	0.01
A	54	0.53	0.08	0.02
A	55	1.00	0.14	0.03
A	56	0.36	0.05	0.01
A	57	0.53	0.08	0.02
A	58	0.37	0.05	0.01
A	59	1.40	0.20	0.05
A	60	1.66	0.24	0.06
A	61	0.55	0.09	0.02
A	62	0.50	0.07	0.02
A	63	0.56	0.08	0.02
A	64	1.35	0.19	0.05
A	65	0.60	0.09	0.02
A	66	0.38	0.05	0.01
A	67	1.00	0.14	0.03
A	68	0.55	0.08	0.02
A	69	0.48	0.07	0.02
A	70	0.70	0.10	0.02
A	71	2.30	0.33	0.08
A	72	1.30	0.19	0.05
A	73	0.76	0.11	0.03
A	74	2.18	0.31	0.08
A	75	1.20	0.17	0.04
A	76	2.28	0.33	0.08
A	77	0.40	0.06	0.01
A	78	0.55	0.08	0.02
A	79	0.55	0.08	0.02
A	80	0.40	0.06	0.01
A	81	1.45	0.21	0.05
A	82	0.32	0.05	0.01
A	83	0.46	0.07	0.02
A	84	2.20	0.31	0.08
A	85	0.46	0.07	0.02
A	86	1.20	0.17	0.04
A	87	0.86	0.12	0.03
A	88	0.56	0.08	0.02
A	89	0.56	0.08	0.02

A	90	0.36	0.05	0.01
A	91	0.55	0.08	0.02
A	92	1.55	0.22	0.05
A	93	0.36	0.05	0.01
A	94	1.00	0.14	0.03
A	95	0.55	0.08	0.02
A	96	0.70	0.10	0.02
A	97	0.85	0.12	0.03
A	98	1.00	0.14	0.03
A	99	0.28	0.04	0.01
A	100	0.70	0.10	0.02
A	101	0.95	0.14	0.03
A	102	1.40	0.20	0.05
A	103	0.24	0.03	0.01
A	104	1.20	0.17	0.04
A	105	1.20	0.17	0.04
A	106	0.70	0.10	0.02
A	107	1.62	0.23	0.06
A	108	1.00	0.14	0.03
A	109	0.48	0.07	0.02
A	110	1.50	0.21	0.05
A	111	0.31	0.04	0.01
A	112	0.48	0.07	0.02
A	113	1.50	0.21	0.05
A	114	0.31	0.04	0.01
A	115	0.77	0.11	0.03
A	116	3.00	0.43	0.10
A	117	1.20	0.17	0.04
A	118	1.45	0.21	0.05
A	119	1.40	0.20	0.05
A	120	0.38	0.05	0.01
A	121	1.25	0.18	0.04
A	122	1.45	0.21	0.05
A	123	1.70	0.24	0.06
A	124	1.55	0.22	0.05
A	125	0.64	0.09	0.02
A	126	0.95	0.14	0.03
A	127	0.56	0.08	0.02
A	128	0.60	0.09	0.02
A	129	0.22	0.03	0.01
A	130	1.50	0.21	0.05
A	131	0.50	0.07	0.02
A	132	0.27	0.04	0.01
A	133	2.10	0.30	0.07
A	134	0.70	0.10	0.02
A	135	1.05	0.15	0.04
A	136	0.63	0.09	0.02
A	137	1.80	0.26	0.06

A	138	0.85	0.12	0.03
A	139	0.73	0.10	0.02
A	140	0.65	0.09	0.02
A	141	1.15	0.16	0.04
A	142	1.55	0.22	0.05
A	143	4.30	0.61	0.15
A	144	0.63	0.09	0.02
A	145	0.80	0.11	0.03
A	146	0.58	0.08	0.02
A	147	0.39	0.05	0.01
A	148	0.75	0.11	0.03
A	149	0.16	0.02	0.00
A	150	0.46	0.07	0.02
A	151	1.08	0.15	0.04
A	152	0.63	0.09	0.02
A	153	0.73	0.10	0.02
A	154	0.11	0.02	0.00
A	155	0.70	0.10	0.02
A	156	0.36	0.05	0.01
A	157	0.90	0.13	0.03
A	158	2.90	0.41	0.10
A	159	0.45	0.06	0.01
A	160	0.63	0.09	0.02
A	161	0.53	0.08	0.02
A	162	0.53	0.08	0.02
A	163	0.53	0.08	0.02
A	164	0.50	0.07	0.02
A	165	0.31	0.04	0.01
A	166	0.78	0.11	0.03
A	167	0.44	0.06	0.01
A	168	0.14	0.02	0.00
A	169	0.33	0.05	0.01
A	170	0.55	0.10	0.02
A	171	1.38	0.20	0.05
A	172	0.48	0.07	0.02
A	173	0.93	0.13	0.03
A	174	0.54	0.08	0.02
A	175	0.51	0.07	0.02
A	176	0.63	0.09	0.02
A	177	1.03	0.15	0.04
A	178	0.43	0.06	0.01
A	179	0.63	0.09	0.02
A	180	0.26	0.04	0.01
A	181	0.93	0.13	0.03
A	182	0.55	0.08	0.02
A	183	2.65	0.38	0.09
A	184	0.65	0.09	0.02

A	185	0.66	0.10	0.02
A	186	1.05	0.15	0.04
A	187	0.53	0.08	0.02
A	188	0.43	0.06	0.01
A	189	0.98	0.14	0.03
A	190	0.63	0.09	0.02
A	191	0.31	0.04	0.01
A	192	0.43	0.06	0.01
A	193	0.40	0.06	0.01
A	194	0.63	0.09	0.02
A	195	2.95	0.42	0.10
A	196	1.45	0.21	0.05
A	197	3.68	0.53	0.13
B	198	7.50	1.07	0.26
B	199	4.60	0.66	0.16
B	200	9.50	1.36	0.33
B	201	9.30	1.37	0.33
B	202	2.70	0.39	0.10
B	203	7.10	1.01	0.25
B	204	3.40	0.49	0.12
B	205	5.20	0.74	0.18
B	206	4.50	0.64	0.16
B	207	8.90	1.27	0.31
B	208	9.30	1.33	0.32
B	209	5.60	0.80	0.20
B	210	4.40	0.63	0.15
B	211	8.10	1.16	0.28
B	212	5.30	0.76	0.19
B	213	4.90	0.70	0.17
B	214	3.20	0.42	0.10
B	215	9.00	1.29	0.31
B	216	3.10	0.44	0.11
B	217	8.00	1.14	0.28
B	218	5.40	0.77	0.19
B	219	5.70	0.81	0.20
B	220	5.40	0.77	0.19
B	221	6.10	0.87	0.21
B	222	5.40	0.77	0.19
B	223	3.80	0.54	0.13
B	224	2.50	0.36	0.09
B	225	6.60	0.94	0.23
B	226	4.70	0.67	0.16
B	227	5.20	0.74	0.18
B	228	3.90	0.56	0.14
B	229	8.20	1.17	0.29
B	230	5.40	0.77	0.19
B	231	5.30	0.76	0.19

B	232	6.00	0.86	0.21
B	233	11.60	1.66	0.40
B	234	4.50	0.64	0.16
B	235	4.30	0.61	0.15
B	236	9.70	1.39	0.34
B	237	9.20	1.31	0.32
B	238	12.80	1.83	0.45
B	239	16.00	2.29	0.56
B	240	6.00	0.86	0.21
B	241	1.15	0.16	0.04
B	242	0.75	0.11	0.03
B	243	0.36	0.05	0.01
B	244	1.10	0.16	0.04
B	245	1.25	0.16	0.04
B	246	1.12	0.16	0.04
B	247	1.12	0.16	0.04
B	248	0.30	0.04	0.01
B	249	4.00	0.56	0.14
B	250	3.75	0.54	0.13
B	251	1.00	0.14	0.03
B	252	0.38	0.05	0.01
B	253	0.55	0.08	0.02
B	254	0.83	0.12	0.03
B	255	1.25	0.18	0.04
B	256	1.35	0.19	0.05
B	257	0.63	0.09	0.02
B	258	0.93	0.13	0.03
B	259	0.75	0.11	0.03
B	260	2.03	0.28	0.07
B	261	1.00	0.14	0.03
B	262	0.22	1.53	0.37
B	263	2.40	0.34	0.08
B	264	0.55	0.79	0.19
B	265	1 kg	0.14	0.03
B	266	0.75	0.11	0.03
B	267	0.22	0.03	0.01
B	268	0.63	0.09	0.02
B	269	0.65	0.09	0.02
B	270	2.10	0.30	0.07
B	271	0.88	0.13	0.03
B	272	1.00	0.14	0.03
B	273	0.67	0.10	0.02
B	274	0.75	0.11	0.03
B	275	1.35	0.19	0.05
B	276	0.86	0.13	0.03
B	277	1.75	0.25	0.06
B	278	0.55	0.08	0.02

B	279	1.25	0.18	0.04
B	280	4.00	0.57	0.14
B	281	0.75	0.11	0.03
B	282	0.13	0.02	0.00
B	283	3.30	0.47	0.11
B	284	0.30	0.04	0.01
B	285	0.20	0.03	0.01
B	286	0.70	0.10	0.02
B	287	1.30	0.19	0.05
B	288	0.20	0.03	0.01
B	289	0.10	0.01	0.00
B	290	2.85	0.41	0.10
B	291	0.70	0.10	0.02
B	292	0.30	0.04	0.01
B	293	0.40	0.06	0.01
B	294	0.50	0.07	0.02
B	295	0.60	0.09	0.02
B	296	0.70	0.10	0.02
B	297	0.70	0.10	0.02
B	298	0.40	0.06	0.01
B	299	0.01	0.00	0.00
B	300	0.85	0.12	0.03
B	301	0.42	0.06	0.01
B	302	0.55	0.08	0.02
B	303	0.02	0.00	0.00
B	304	0.37	0.05	0.01
B	305	0.56	0.08	0.02
B	306	1.20	0.17	0.04
B	307	0.40	0.06	0.01
B	308	0.75	0.11	0.03
B	309	0.12	0.02	0.00
B	310	0.67	0.10	0.02
B	311	0.72	0.10	0.02
B	312	0.70	0.10	0.02
B	313	6.00	0.86	0.21
B	314	3.90	0.56	0.14
B	315	8.80	1.26	0.31
B	316	4.80	0.69	0.17
B	317	4.90	0.70	0.17
B	318	4.50	0.64	0.16
B	319	7.50	1.07	0.26
B	320	2.90	0.41	0.10
B	321	1.90	0.27	0.07
B	322	2.50	0.36	0.09
B	323	3.00	0.43	0.10
B	324	8.00	1.14	0.28
B	325	14.70	2.10	0.51

B	326	13.40	1.91	0.47
B	327	14.20	2.03	0.50
B	328	0.60	0.09	0.02
B	329	1.13	0.16	0.04
B	330	0.88	0.13	0.03
B	331	1.50	0.21	0.05
B	332	1.45	0.21	0.05
B	333	1.00	0.14	0.03
B	334	0.25	0.04	0.01
B	335	1.00	0.14	0.03
B	336	4.50	0.64	0.16
B	337	0.50	0.07	0.02
B	338	0.38	0.05	0.01
B	339	0.63	0.09	0.02
B	340	0.75	0.11	0.03
B	341	0.13	0.02	0.00
B	342	1.63	0.23	0.06
B	343	0.63	0.09	0.02
B	344	4.13	0.59	0.14
B	345	0.75	0.11	0.03
B	346	1.63	0.23	0.06
B	347	0.63	0.09	0.02
B	348	0.00	0.00	0.00
B	349	0.63	0.09	0.02
B	350	1.00	0.14	0.03
B	351	1.75	0.25	0.06
B	352	1.00	0.14	0.03
B	353	0.25	0.04	0.01
B	354	0.75	0.11	0.03
B	355	1.00	0.14	0.03
B	356	4.25	0.61	0.15
B	357	0.38	0.05	0.01
B	358	1.25	0.18	0.04
B	359	2.63	0.36	0.09
B	360	0.65	0.09	0.02
B	361	1.10	0.16	0.04
B	362	1.40	0.20	0.05
B	363	1.00	0.14	0.03
B	364	3.10	0.44	0.11
B	365	0.60	0.09	0.02
B	366	1.30	0.19	0.05
B	367	0.70	0.10	0.02
B	368	0.30	0.04	0.01
B	369	0.40	0.06	0.01
B	370	0.80	0.11	0.03
B	371	0.60	0.09	0.02
B	372	0.80	0.11	0.03

B	373	0.90	0.13	0.03
B	374	0.80	0.11	0.03
B	375	0.70	0.10	0.02
B	376	1.10	0.16	0.04
B	377	0.20	0.03	0.01
B	378	0.10	0.14	0.03
B	379	1.10	0.16	0.04
B	380	0.10	0.01	0.00
B	381	0.70	0.10	0.02
B	382	0.50	0.71	0.17
B	383	0.00	0.00	0.00
B	384	0.40	0.06	0.01
B	385	0.70	0.10	0.02
B	386	0.00	0.00	0.00
B	387	0.30	0.04	0.01
B	388	1.00	0.14	0.03
B	389	0.70	0.10	0.02
B	390	1.20	0.17	0.04
B	391	0.40	0.06	0.01
B	392	0.60	0.09	0.02
B	393	0.40	0.06	0.01
B	394	0.70	0.10	0.02
B	395	0.50	0.07	0.02
B	396	0.20	0.03	0.01
B	397	1.09	0.16	0.04
B	398	0.30	0.04	0.01
B	399	0.40	0.06	0.01
B	400	0.10	0.01	0.00
B	401	0.30	0.04	0.01
B	402	2.35	0.34	0.08
B	403	6.00	0.86	0.21
B	404	8.00	1.14	0.28
B	405	3.60	0.51	0.12
B	406	6.00	0.86	0.21
B	407	7.30	1.04	0.25
B	408	2.80	0.40	0.10
B	409	3.30	0.47	0.11
B	410	2.80	0.40	0.10
B	411	2.10	0.30	0.07
B	412	2.40	0.34	0.08
B	413	1.50	0.21	0.05
B	414	5.00	0.71	0.17
B	415	5.30	0.76	0.19
B	416	4.80	0.69	0.17
B	417	1.80	0.26	0.06
B	418	3.90	0.56	0.14
B	419	4.00	0.57	0.14

B	420	5.30	0.76	0.19
B	421	2.60	0.37	0.09
B	422	3.40	0.49	0.12
B	423	6.00	0.86	0.21
B	424	6.60	0.94	0.23
B	425	5.10	0.73	0.18
B	426	4.20	0.60	0.15
B	427	4.80	0.59	0.14
B	428	0.25	0.04	0.01
B	429	2.00	0.26	0.06
B	430	2.63	0.38	0.09
B	431	0.75	0.11	0.03
B	432	0.13	0.02	0.00
B	433	0.25	0.04	0.01
B	434	2.50	0.36	0.09
B	435	0.13	0.02	0.00
B	436	0.25	0.04	0.01
B	437	0.13	0.02	0.00
B	438	3.00	0.43	0.10
B	439	1.75	0.25	0.06
B	440	0.50	0.07	0.02
B	441	0.63	0.09	0.02
B	442	0.30	0.04	0.01
B	443	0.40	0.06	0.01
B	444	0.30	0.04	0.01
B	445	0.45	0.06	0.01
B	446	0.20	0.03	0.01
B	447	0.80	0.11	0.03
B	448	0.10	0.01	0.00
B	449	0.10	0.01	0.00
B	450	0.95	0.14	0.03
B	451	1.40	0.20	0.05
B	452	0.85	0.12	0.03
B	453	0.20	0.03	0.01
B	454	3.10	0.44	0.11
B	455	0.85	0.12	0.03
B	456	0.80	0.11	0.03
B	457	0.55	0.08	0.02
B	458	0.10	0.01	0.00
B	459	0.10	0.01	0.00
B	460	1.75	0.25	0.06
B	461	0.20	0.03	0.01
B	462	0.75	0.11	0.03
B	463	1.35	0.19	0.05
B	464	0.40	0.06	0.01
B	465	0.45	0.06	0.01
B	466	1.30	0.19	0.05

B	467	1.15	0.16	0.04
B	468	0.10	0.01	0.00
B	469	0.10	0.01	0.00
B	470	0.00	0.00	0.00
B	471	0.20	0.03	0.01
B	472	0.40	0.06	0.01
B	473	0.10	0.01	0.00
B	474	1.05	0.15	0.04
B	475	1.20	0.17	0.04
B	476	0.60	0.09	0.02
B	477	0.70	0.10	0.02
B	478	0.55	0.08	0.02
B	479	3.60	0.51	0.12
B	480	0.55	0.08	0.02
B	481	1.75	0.25	0.06
B	482	0.30	0.04	0.01
B	483	0.50	0.07	0.02
B	484	2.40	0.34	0.08
B	485	0.50	0.07	0.02
B	486	0.10	0.01	0.00
B	487	0.85	0.12	0.03
B	488	0.40	0.06	0.01
B	489	0.40	0.06	0.01
B	490	0.50	0.07	0.02
B	491	0.20	0.03	0.01
B	492	1.25	0.18	0.04
B	493	3.55	0.51	0.12
B	494	0.75	0.11	0.03
B	495	7.15	1.02	0.25
B	496	0.40	0.06	0.01
B	497	1.45	0.21	0.05
B	498	0.50	0.07	0.02
B	499	0.30	0.04	0.01
B	500	0.30	0.04	0.01
B	501	0.30	0.40	0.10
B	502	0.55	0.08	0.02
B	503	1.25	0.18	0.04
B	504	0.55	0.08	0.02
B	505	3.95	0.56	0.14
B	506	1.45	0.21	0.05
B	507	1.65	0.24	0.06
B	508	1.00	0.14	0.03
B	509	0.35	0.05	0.01
B	510	0.85	0.12	0.03
B	511	0.80	0.11	0.03
B	512	1.10	0.16	0.04
B	513	0.50	0.07	0.02

B	514	9.10	1.30	0.32
B	515	1.10	0.16	0.04
B	516	2.40	0.34	0.08
B	517	8.65	1.24	0.30
B	518	0.55	0.08	0.02
B	519	0.95	0.14	0.03
B	520	0.90	0.13	0.03
B	521	1.25	0.18	0.04
B	522	1.35	0.19	0.05
B	523	0.30	0.04	0.01
B	524	0.40	0.06	0.01
B	525	0.90	0.13	0.03
B	526	2.30	0.33	0.08
B	527	1.65	0.24	0.06
B	528	1.95	0.28	0.07
B	529	1.40	0.20	0.05
B	530	0.90	0.13	0.03
B	531	1.00	0.14	0.03
B	532	1.00	0.14	0.03
B	533	0.40	0.06	0.01
B	534	2.50	0.36	0.09
B	535	0.00	0.00	0.00
B	536	1.25	0.18	0.04
B	537	7.00	1.00	0.24
B	538	3.20	0.46	0.11
B	539	2.80	0.40	0.10
B	540	0.50	0.07	0.02
B	541	3.30	0.47	0.11
B	542	2.80	0.40	0.10
B	543	5.60	0.80	0.20
B	544	3.70	0.53	0.13
B	545	1.00	0.14	0.03
B	546	0.25	0.04	0.01
C	547	0.60	0.09	0.02
C	548	0.50	0.07	0.02
C	549	0.80	0.11	0.03
C	550	0.20	0.03	0.01
C	551	0.20	0.03	0.01
C	552	0.20	0.03	0.01
C	553	0.25	0.04	0.01
C	554	0.10	0.01	0.00
C	555	0.15	0.02	0.00
C	556	0.20	0.03	0.01
C	557	0.55	0.08	0.02
C	558	0.22	0.03	0.01
C	559	0.40	0.06	0.01
C	560	0.20	0.03	0.01

C	561	0.23	0.03	0.01
C	562	0.80	0.11	0.03
C	563	0.03	0.00	0.00
C	564	0.10	0.01	0.00
C	565	0.25	0.04	0.01
C	566	0.15	0.02	0.00
C	567	0.60	0.09	0.02
C	568	0.03	0.00	0.00
C	569	0.20	0.03	0.01
C	570	0.50	0.07	0.02
C	571	0.10	0.01	0.00
C	572	0.30	0.04	0.01
C	573	0.30	0.04	0.01
C	574	0.20	0.03	0.01
C	575	0.30	0.04	0.01
C	576	0.40	0.06	0.01
C	577	0.60	0.09	0.02
C	578	0.40	0.06	0.01
C	579	0.10	0.01	0.00
C	580	0.40	0.06	0.01
C	581	0.20	0.03	0.01
C	582	0.60	0.09	0.02
C	583	0.20	0.03	0.01
C	584	0.10	0.01	0.00
C	585	0.60	0.09	0.02
C	586	0.30	0.04	0.01
C	587	0.30	0.04	0.01
C	588	0.20	0.03	0.01
C	589	0.20	0.03	0.01
C	590	0.20	0.03	0.01
C	591	0.20	0.03	0.01
C	592	0.20	0.03	0.01
C	593	0.05	0.01	0.00
C	594	0.50	0.70	0.17
C	595	0.20	0.03	0.01
C	596	0.25	0.04	0.01
C	597	0.11	0.02	0.00
C	598	0.14	0.02	0.00
C	599	0.40	0.06	0.01
C	600	0.70	0.10	0.02
C	601	0.55	0.08	0.02
C	602	0.14	0.02	0.00
C	603	0.55	0.08	0.02
C	604	0.03	0.00	0.00
C	605	0.60	0.09	0.02
C	606	0.15	0.02	0.00
C	607	0.70	0.10	0.02

C	608	0.50	0.07	0.02
C	609	0.12	0.02	0.00
C	610	0.75	0.11	0.03
C	611	0.10	0.01	0.00
C	612	0.30	0.04	0.01
C	613	0.50	0.07	0.02
C	614	0.80	0.11	0.03
C	615	0.30	0.04	0.01
C	616	0.20	0.03	0.01
C	617	0.10	0.01	0.00
C	618	0.00	0.00	0.00
C	619	0.10	0.01	0.00
C	620	0.40	0.06	0.01
C	621	0.10	0.01	0.00
C	622	0.50	0.07	0.02
C	623	0.60	0.09	0.02
C	624	1.15	0.16	0.04
C	625	0.31	0.04	0.01
C	626	0.75	0.11	0.03
C	627	0.20	0.03	0.01
C	628	0.50	0.07	0.02
C	629	0.85	0.12	0.03
C	630	0.80	0.11	0.03
C	631	0.43	0.06	0.01
C	632	0.10	0.01	0.00
C	633	0.00	0.00	0.00
C	634	0.85	0.12	0.03
C	635	0.00	0.00	0.00
C	636	0.20	0.03	0.01
C	637	0.50	0.07	0.02
C	638	0.40	0.06	0.01
C	639	0.08	0.01	0.00
C	640	0.20	0.03	0.01
C	641	0.28	0.04	0.01
C	642	0.00	0.00	0.00
C	643	0.70	0.10	0.02
C	644	0.20	0.03	0.01
C	645	0.15	0.02	0.00
C	646	0.05	0.01	0.00
C	647	0.20	0.03	0.01
C	648	0.35	0.07	0.02
C	649	0.10	0.01	0.00
C	650	0.05	0.01	0.00
C	651	0.20	0.03	0.01
C	652	0.30	0.04	0.01
C	653	0.20	0.03	0.01
C	654	0.45	0.06	0.01

C	655	0.80	0.11	0.03
C	656	0.70	0.10	0.02
C	657	0.70	0.10	0.02
C	658	0.80	0.11	0.03
C	659	0.05	0.01	0.00
C	660	0.60	0.09	0.02
C	661	0.20	0.03	0.01
C	662	0.40	0.06	0.01
C	663	0.20	0.03	0.01
C	664	0.45	0.06	0.01
C	665	0.73	0.10	0.02
C	666	0.20	0.03	0.01
C	667	0.20	0.03	0.01
C	668	0.20	0.03	0.01
C	669	0.50	0.07	0.02
C	670	0.00	0.00	0.00
C	671	0.05	0.01	0.00
C	672	0.13	0.02	0.00
C	673	0.90	0.13	0.03
C	674	0.20	0.03	0.01
C	675	1.10	0.16	0.04
C	676	0.40	0.06	0.01
C	677	0.38	0.05	0.01
C	678	0.30	0.04	0.01
C	679	0.55	0.08	0.02
C	680	0.03	0.00	0.00
C	681	0.20	0.03	0.01
C	682	0.50	0.04	0.01
C	683	0.80	0.11	0.03
C	684	0.00	0.00	0.00
C	685	0.20	0.03	0.01
C	686	0.55	0.08	0.02
C	687	0.10	0.01	0.00
C	688	2.23	0.52	0.13
C	689	0.55	0.08	0.02
C	690	0.20	0.03	0.01
C	691	0.20	0.03	0.01
C	692	0.35	0.05	0.01
C	693	0.05	0.01	0.00
C	694	0.10	0.01	0.00
C	695	0.45	0.06	0.01
C	696	0.50	0.07	0.02
C	697	0.20	0.03	0.01
C	698	0.25	0.04	0.01
C	699	0.45	0.06	0.01
C	700	0.35	0.05	0.01
C	701	0.53	0.08	0.02

C	702	0.40	0.06	0.01
C	703	0.30	0.04	0.01
C	704	0.55	0.08	0.02
C	705	0.05	0.01	0.00
C	706	0.20	0.03	0.01
C	707	0.50	0.07	0.02
C	708	0.30	0.04	0.01
C	709	0.00	0.00	0.00
C	710	0.30	0.04	0.01
C	711	0.50	0.07	0.02
C	712	0.20	0.03	0.01
C	713	0.40	0.06	0.01
C	714	0.00	0.00	0.00
C	715	0.10	0.01	0.00
C	716	0.30	0.04	0.01
C	717	0.20	0.03	0.01
C	718	0.50	0.07	0.02
C	719	0.50	0.07	0.02
C	720	0.45	0.06	0.01
C	721	0.40	0.06	0.01
C	722	0.35	0.05	0.01
C	723	0.25	0.04	0.01
C	724	0.50	0.07	0.02
C	725	0.20	0.03	0.01
C	726	0.25	0.04	0.01
C	727	0.10	0.01	0.00
C	728	0.30	0.04	0.01
C	729	0.33	0.05	0.01
C	730	0.23	0.03	0.01
C	731	0.50	0.07	0.02
C	732	0.20	0.03	0.01
C	733	0.50	0.07	0.02
AVERAGE		**1.43**	**0.21**	**0.05**

Appendix Table 20. Plastic waste generation per barangay.

City/Municipality	Barangays	Population	Average per capita plastic production in IRW (kg/day/person)	Plastic Production per barangay (kg/day)
Silang	Balite I	3,435	0.05	176.20
Silang	Balite II	2,887	0.05	148.09
Silang	Barangay I	1,155	0.05	59.25
Silang	Barangay II	895	0.05	45.91
Silang	Barangay III	377	0.05	19.34
Silang	Barangay V	2,188	0.05	112.24
Silang	Biga II	5,988	0.05	307.16
Silang	Buho	3,108	0.05	159.43
Silang	Iba	5,148	0.05	264.07
Silang	Lalaan I	6,114	0.05	313.62
Silang	Lalaan II	7,858	0.05	403.08
Silang	Malabag	4,986	0.05	255.76
Silang	Malaking Tatyao	2,280	0.05	116.95
Silang	Mataas Na Burol	934	0.05	47.91
Silang	Sabutan	7,890	0.05	404.73
Silang	San Vicente II	4,593	0.05	235.60
Silang	Toledo	1,796	0.05	92.13
Silang	Tubuan I	2,902	0.05	148.86
Silang	Tubuan III	1,167	0.05	59.86
Tagaytay City	Kaybagal East	5,113	0.05	262.28
Tagaytay City	Mag-Asawang Ilat	1,605	0.05	82.33
Tagaytay City	Maharlika East	1,063	0.05	54.53
Tagaytay City	Maitim 2nd Central	1,536	0.05	78.79
Tagaytay City	Maitim 2nd West	883	0.05	45.29
Tagaytay City	Silang Junction North	2,483	0.05	127.37
Tagaytay City	Silang Junction South	1,608	0.05	82.48
Kawit	Toclong	23,649	0.05	1213.10
Kawit	Balsahan-Bisita	1,923	0.05	98.64
Kawit	Binakayan-Aplaya	3,345	0.05	171.58
Kawit	Binakayan-Kanluran	2,522	0.05	129.37
Kawit	Congbalay-Legaspi	4,367	0.05	224.01
Kawit	Manggahan-Lawin	4,641	0.05	238.06
Kawit	Pulvorista	11,892	0.05	610.01
Kawit	Samala-Marquez	6,449	0.05	330.81
Imus	Anabu I-A	6,264	0.05	321.32
Imus	Anabu I-B	2,566	0.05	131.63
Imus	Anabu I-C	7,362	0.05	377.64
Imus	Anabu I-D	3,828	0.05	196.36
Imus	Anabu I-E	2,731	0.05	140.09
Imus	Anabu I-F	2,675	0.05	137.22
Imus	Anabu I-G	2,417	0.05	123.98

Imus	Anabu II-A	3,382	0.05	173.48
Imus	Anabu II-B	7,650	0.05	392.41
Imus	Anabu II-C	6,562	0.05	336.60
Imus	Anabu II-D	5,273	0.05	270.48
Imus	Anabu II-E	5,542	0.05	284.28
Imus	Anabu II-F	9,562	0.05	490.49
Imus	Bagong Silang	788	0.05	40.42
Imus	Bayan Luma I	4,141	0.05	212.42
Imus	Bayan Luma II	1,631	0.05	83.66
Imus	Bayan Luma III	3,672	0.05	188.36
Imus	Bayan Luma IV	2,708	0.05	138.91
Imus	Bayan Luma IX	2,932	0.05	150.40
Imus	Bayan Luma V	4,659	0.05	238.99
Imus	Bayan Luma VI	2,715	0.05	139.27
Imus	Bayan Luma VII	4,132	0.05	211.95
Imus	Bayan Luma VIII	2,737	0.05	140.40
Imus	Bucandala I	9,935	0.05	509.63
Imus	Bucandala II	2,157	0.05	110.65
Imus	Bucandala V	5,855	0.05	300.34
Imus	Buhay na Tubig	39,010	0.05	2001.06
Imus	Carsadang Bago I	17,844	0.05	915.33
Imus	Magdalo	4,479	0.05	229.75
Imus	Maharlika	5,786	0.05	296.80
Imus	Malagasang I-F	10,544	0.05	540.86
Imus	Malagasang I-G	25,847	0.05	1325.85
Imus	Malagasang II-E	2,375	0.05	121.83
Imus	Malagasang II-F	1,461	0.05	74.94
Imus	Malagasang II-G	4,739	0.05	243.09
Imus	Mariano Espeleta I	1,400	0.05	71.81
Imus	Mariano Espeleta II	1,300	0.05	66.68
Imus	Mariano Espeleta III	1,423	0.05	72.99
Imus	Medicion I-C	3,065	0.05	157.22
Imus	Medicion I-D	1,124	0.05	57.66
Imus	Medicion II-C	1,538	0.05	78.89
Imus	Medicion II-D	1,519	0.05	77.92
Imus	Medicion II-E	1,525	0.05	78.23
Imus	Medicion II-F	1,234	0.05	63.30
Imus	Palico I	2,066	0.05	105.98
Imus	Palico II	1,801	0.05	92.38
Imus	Palico III	483	0.05	24.78
Imus	Palico IV	3,677	0.05	188.62
Imus	Pasong Buaya I	2,219	0.05	113.83
Imus	Pasong Buaya II	35,599	0.05	1826.08
Imus	Pinagbuklod	1,801	0.05	92.38
Imus	Poblacion I-A	1,949	0.05	99.98
Imus	Poblacion I-B	312	0.05	16.00
Imus	Poblacion I-C	261	0.05	13.39

Imus	Poblacion II-A	771	0.05	39.55
Imus	Poblacion II-B	441	0.05	22.62
Imus	Poblacion III-A	1,079	0.05	55.35
Imus	Poblacion III-B	654	0.05	33.55
Imus	Poblacion IV-A	1,427	0.05	73.20
Imus	Poblacion IV-B	549	0.05	28.16
Imus	Poblacion IV-C	1,018	0.05	52.22
Imus	Poblacion IV-D	1,116	0.05	57.25
Imus	Tanzang Luma I	1,490	0.05	76.43
Imus	Tanzang Luma II	1,413	0.05	72.48
Imus	Tanzang Luma III	1,993	0.05	102.23
Imus	Tanzang Luma IV	2,344	0.05	120.24
Imus	Tanzang Luma V	2,173	0.05	111.47
Imus	Tanzang Luma VI	2,169	0.05	111.26
Imus	Toclong I-A	1,189	0.05	60.99
Imus	Toclong I-B	1,730	0.05	88.74
Imus	Toclong I-C	1,569	0.05	80.48
Imus	Toclong II-A	1,244	0.05	63.81
Imus	Toclong II-B	2,387	0.05	122.44
Dasmariñas	Zone IV	3,770	0.05	193.39
Dasmariñas	Burol I	17,287	0.05	886.75
Dasmariñas	Burol II	6,025	0.05	309.06
Dasmariñas	Burol III	10,921	0.05	560.20
Dasmariñas	Burol	11,902	0.05	610.52
Dasmariñas	Datu Esmael	7,969	0.05	408.78
Dasmariñas	Emmanuel Bergado I	8,002	0.05	410.47
Dasmariñas	Emmanuel Bergado II	2,796	0.05	143.42
Dasmariñas	Fatima I	6,782	0.05	347.89
Dasmariñas	Fatima II	4,305	0.05	220.83
Dasmariñas	Fatima III	3,684	0.05	188.97
Dasmariñas	Luzviminda I	3,565	0.05	182.87
Dasmariñas	Luzviminda II	4,868	0.05	249.71
Dasmariñas	Paliparan I	10,125	0.05	519.37
Dasmariñas	Paliparan II	20,804	0.05	1067.16
Dasmariñas	Paliparan III	72,945	0.05	3741.78
Dasmariñas	Sabang	17,329	0.05	888.91
Dasmariñas	Saint Peter I	2,287	0.05	117.31
Dasmariñas	Saint Peter II	2,471	0.05	126.75
Dasmariñas	Salawag	78,778	0.05	4040.99
Dasmariñas	Salitran I	5,158	0.05	264.58
Dasmariñas	Salitran II	12,337	0.05	632.84
Dasmariñas	Salitran III	15,396	0.05	789.75
Dasmariñas	Salitran IV	11,819	0.05	606.27
Dasmariñas	Sampaloc I	7,662	0.05	393.03
Dasmariñas	Sampaloc II	18,225	0.05	934.87
Dasmariñas	Sampaloc III	13,807	0.05	708.24
Dasmariñas	Sampaloc IV	41,678	0.05	2137.91

Dasmariñas	Sampaloc V	3,252	0.05	166.81
Dasmariñas	San Agustin I	11,971	0.05	614.06
Dasmariñas	San Agustin II	11,692	0.05	599.75
Dasmariñas	San Agustin III	10,178	0.05	522.09
Dasmariñas	San Andres I	4,259	0.05	218.47
Dasmariñas	San Andres II	3,405	0.05	174.66
Dasmariñas	San Antonio de Padua I	3,407	0.05	174.77
Dasmariñas	San Antonio de Padua II	3,062	0.05	157.07
Dasmariñas	San Dionisio	6,741	0.05	345.79
Dasmariñas	San Esteban	4,583	0.05	235.09
Dasmariñas	San Francisco I	3,099	0.05	158.97
Dasmariñas	San Francisco II	3,363	0.05	172.51
Dasmariñas	San Isidro Labrador I	4,834	0.05	247.96
Dasmariñas	San Isidro Labrador II	2,463	0.05	126.34
Dasmariñas	San Jose	11,925	0.05	611.70
Dasmariñas	San Juan	3,667	0.05	188.10
Dasmariñas	San Lorenzo Ruiz I	3,311	0.05	169.84
Dasmariñas	San Lorenzo Ruiz II	4,275	0.05	219.29
Dasmariñas	San Luis I	3,963	0.05	203.29
Dasmariñas	San Luis II	4,336	0.05	222.42
Dasmariñas	San Manuel I	2,822	0.05	144.76
Dasmariñas	San Manuel II	2,581	0.05	132.39
Dasmariñas	San Mateo	4,950	0.05	253.91
Dasmariñas	San Miguel II	2,272	0.05	116.54
Dasmariñas	San Miguel	4,118	0.05	211.24
Dasmariñas	San Nicolas I	2,071	0.05	106.23
Dasmariñas	San Nicolas II	4,576	0.05	234.73
Dasmariñas	San Roque	2,855	0.05	146.45
Dasmariñas	San Simon	6,242	0.05	320.19
Dasmariñas	Santa Cristina I	3,307	0.05	169.64
Dasmariñas	Santa Cristina II	3,505	0.05	179.79
Dasmariñas	Santa Cruz I	5,112	0.05	262.22
Dasmariñas	Santa Cruz II	2,138	0.05	109.67
Dasmariñas	Santa Fe	6,314	0.05	323.88
Dasmariñas	Santa Lucia	5,534	0.05	283.87
Dasmariñas	Santa Maria	5,068	0.05	259.97
Dasmariñas	Santo Cristo	4,551	0.05	233.45
Dasmariñas	Santo Niño I	2,859	0.05	146.66
Dasmariñas	Santo Niño II	2,737	0.05	140.40
Dasmariñas	Zone I-B	5,595	0.05	287.00
Dasmariñas	Zone I	4,219	0.05	216.42
Bacoor	Alima	5,639	0.05	289.26
Bacoor	Aniban I	3,341	0.05	171.38
Bacoor	Banalo	2,848	0.05	146.09
Bacoor	Bayanan	11,168	0.05	572.87

Bacoor	Campo Santo	1,329	0.05	68.17
Bacoor	Daang Bukid	2,839	0.05	145.63
Bacoor	Digman	2,078	0.05	106.59
Bacoor	Dulong Bayan	6,744	0.05	345.94
Bacoor	Habay I	19,965	0.05	1024.12
Bacoor	Habay II	11,888	0.05	609.81
Bacoor	Kaingin	3,503	0.05	179.69
Bacoor	Ligas III	8,219	0.05	421.60
Bacoor	Mabolo I	1,430	0.05	73.35
Bacoor	Mabolo II	1,306	0.05	66.99
Bacoor	Mabolo III	2,335	0.05	119.78
Bacoor	Maliksi I	5,273	0.05	270.48
Bacoor	Mambog I	12,330	0.05	632.48
Bacoor	Mambog II	7,129	0.05	365.69
Bacoor	Mambog III	21,445	0.05	1100.04
Bacoor	Mambog IV	13,868	0.05	711.37
Bacoor	Mambog V	3,832	0.05	196.57
Bacoor	Molino II	42,395	0.05	2174.69
Bacoor	Molino III	60,495	0.05	3103.15
Bacoor	Molino IV	66,886	0.05	3430.98
Bacoor	Molino V	6,562	0.05	336.60
Bacoor	Molino VII	12,883	0.05	660.85
Bacoor	Niog I	7,007	0.05	359.43
Bacoor	Niog II	4,600	0.05	235.96
Bacoor	P.F. Espiritu I	4,304	0.05	220.78
Bacoor	P.F. Espiritu II	1,741	0.05	89.31
Bacoor	P.F. Espiritu III	5,247	0.05	269.15
Bacoor	P.F. Espiritu IV	11,694	0.05	599.85
Bacoor	P.F. Espiritu V	5,640	0.05	289.31
Bacoor	P.F. Espiritu VI	2,767	0.05	141.94
Bacoor	P.F. Espiritu VII	3,682	0.05	188.87
Bacoor	P.F. Espiritu VIII	7,876	0.05	404.01
Bacoor	Queens Row East	18,370	0.05	942.31
Bacoor	Real I	5,282	0.05	270.95
Bacoor	Real II	4,699	0.05	241.04
Bacoor	Salinas I	19,658	0.05	1008.38
Bacoor	Salinas II	5,777	0.05	296.34
Bacoor	Salinas III	1,813	0.05	93.00
Bacoor	Salinas IV	1,335	0.05	68.48
Bacoor	Sineguelasan	5,561	0.05	285.26
Bacoor	Tabing Dagat	3,424	0.05	175.64
Amadeo	Buho	1,704	0.05	87.41

Appendix Table 21. Hotspot analysis result.

City/Municipality	Barangay	Plastic Production	Z-Score	P-Value	Neighbors
Amadeo	Buho	87.41	-1.48	0.14	14
Bacoor	Alima	289.26	-2.16	0.03	89
Bacoor	Aniban I	171.38	-2.46	0.01	94
Bacoor	Banalo	146.09	-2.11	0.03	88
Bacoor	Bayanan	572.87	-1.29	0.20	101
Bacoor	Campo Santo	68.17	-2.20	0.03	89
Bacoor	Daang Bukid	145.63	-2.20	0.03	89
Bacoor	Digman	106.59	-2.43	0.02	84
Bacoor	Dulong Bayan	345.94	-2.59	0.01	98
Bacoor	Habay I	1024.12	-2.70	0.01	101
Bacoor	Habay II	609.81	-2.59	0.01	98
Bacoor	Kaingin	179.69	-2.43	0.02	84
Bacoor	Ligas III	421.60	-2.42	0.02	96
Bacoor	Mabolo I	73.35	-2.47	0.01	95
Bacoor	Mabolo II	66.99	-2.59	0.01	98
Bacoor	Mabolo III	119.78	-2.35	0.02	93
Bacoor	Maliksi I	270.48	-2.57	0.01	83
Bacoor	Mambog I	632.48	-0.78	0.43	111
Bacoor	Mambog II	365.69	-0.65	0.51	100
Bacoor	Mambog III	1100.04	-1.48	0.14	109
Bacoor	Mambog IV	711.37	-1.56	0.12	113
Bacoor	Mambog V	196.57	-1.56	0.12	113
Bacoor	Molino II	2174.69	3.90	0.00	38
Bacoor	Molino III	3103.15	3.83	0.00	32
Bacoor	Molino IV	3430.98	1.98	0.05	48
Bacoor	Molino V	336.60	0.44	0.66	85
Bacoor	Molino VII	660.85	1.40	0.16	57
Bacoor	Niog I	359.43	-2.66	0.01	98
Bacoor	Niog II	235.96	-2.33	0.02	91
Bacoor	P.F. Espiritu I	220.78	-2.36	0.02	106
Bacoor	P.F. Espiritu II	89.31	-2.33	0.02	111
Bacoor	P.F. Espiritu III	269.15	-2.41	0.02	108
Bacoor	P.F. Espiritu IV	599.85	-2.36	0.02	106
Bacoor	P.F. Espiritu V	289.31	-2.75	0.01	102
Bacoor	P.F. Espiritu VI	141.94	-2.70	0.01	101
Bacoor	P.F. Espiritu VII	188.87	-2.65	0.01	100
Bacoor	P.F. Espiritu VIII	404.01	-2.52	0.01	95
Bacoor	Queens Row East	942.31	1.74	0.08	58
Bacoor	Real I	270.95	-2.50	0.01	108
Bacoor	Real II	241.04	-2.55	0.01	109
Bacoor	Salinas I	1008.38	-2.70	0.01	100
Bacoor	Salinas II	296.34	-2.70	0.01	101
Bacoor	Salinas III	93.00	-2.85	0.00	104
Bacoor	Salinas IV	68.48	-2.81	0.00	104

Bacoor	Sineguelasan	285.26	-2.44	0.01	78
Bacoor	Tabing Dagat	175.64	-2.36	0.02	81
Dasmariñas	Zone IV	193.39	1.26	0.21	69
Dasmariñas	Burol I	886.75	2.17	0.03	69
Dasmariñas	Burol II	309.06	1.82	0.07	67
Dasmariñas	Burol III	560.20	2.17	0.03	69
Dasmariñas	Burol	610.52	1.42	0.16	71
Dasmariñas	Datu Esmael	408.78	1.95	0.05	70
Dasmariñas	Emmanuel Bergado I	410.47	1.90	0.06	68
Dasmariñas	Emmanuel Bergado II	143.42	1.82	0.07	67
Dasmariñas	Fatima I	347.89	1.90	0.06	68
Dasmariñas	Fatima II	220.83	1.80	0.07	66
Dasmariñas	Fatima III	188.97	1.57	0.12	65
Dasmariñas	Luzviminda I	182.87	1.80	0.07	66
Dasmariñas	Luzviminda II	249.71	1.51	0.13	64
Dasmariñas	Paliparan I	519.37	1.05	0.29	38
Dasmariñas	Paliparan II	1067.16	2.24	0.03	50
Dasmariñas	Paliparan III	3741.78	1.74	0.08	65
Dasmariñas	Sabang	888.91	0.55	0.58	58
Dasmariñas	Saint Peter I	117.31	1.39	0.16	74
Dasmariñas	Saint Peter II	126.75	1.39	0.16	74
Dasmariñas	Salawag	4040.99	2.56	0.01	72
Dasmariñas	Salitran I	264.58	1.18	0.24	67
Dasmariñas	Salitran II	632.84	1.45	0.15	74
Dasmariñas	Salitran III	789.75	2.14	0.03	76
Dasmariñas	Salitran IV	606.27	2.12	0.03	76
Dasmariñas	Sampaloc I	393.03	0.71	0.48	58
Dasmariñas	Sampaloc II	934.87	1.26	0.21	44
Dasmariñas	Sampaloc III	708.24	1.56	0.12	31
Dasmariñas	Sampaloc IV	2137.91	1.98	0.05	54
Dasmariñas	Sampaloc V	166.81	0.92	0.36	19
Dasmariñas	San Agustin I	614.06	1.74	0.08	67
Dasmariñas	San Agustin II	599.75	1.70	0.09	67
Dasmariñas	San Agustin III	522.09	1.70	0.09	68
Dasmariñas	San Andres I	218.47	1.77	0.08	67
Dasmariñas	San Andres II	174.66	1.82	0.07	67
Dasmariñas	San Antonio de Padua I	174.77	1.82	0.07	67
Dasmariñas	San Antonio de Padua II	157.07	1.78	0.07	66
Dasmariñas	San Dionisio	345.79	1.98	0.05	76
Dasmariñas	San Esteban	235.09	1.79	0.07	73
Dasmariñas	San Francisco I	158.97	1.90	0.06	68
Dasmariñas	San Francisco II	172.51	1.90	0.06	68
Dasmariñas	San Isidro Labrador I	247.96	1.42	0.16	75
Dasmariñas	San Isidro Labrador II	126.34	1.39	0.16	74
Dasmariñas	San Jose	611.70	0.28	0.78	67

Dasmariñas	San Juan	188.10	1.39	0.16	75
Dasmariñas	San Lorenzo Ruiz I	169.84	1.74	0.08	67
Dasmariñas	San Lorenzo Ruiz II	219.29	1.80	0.07	66
Dasmariñas	San Luis I	203.29	1.74	0.08	67
Dasmariñas	San Luis II	222.42	1.74	0.08	67
Dasmariñas	San Manuel I	144.76	1.83	0.07	74
Dasmariñas	San Manuel II	132.39	1.76	0.08	74
Dasmariñas	San Mateo	253.91	1.80	0.07	66
Dasmariñas	San Miguel II	116.54	1.35	0.18	74
Dasmariñas	San Miguel	211.24	1.39	0.16	75
Dasmariñas	San Nicolas I	106.23	1.68	0.09	66
Dasmariñas	San Nicolas II	234.73	1.74	0.08	65
Dasmariñas	San Roque	146.45	1.82	0.07	67
Dasmariñas	San Simon	320.19	1.80	0.07	66
Dasmariñas	Santa Cristina I	169.64	2.29	0.02	68
Dasmariñas	Santa Cristina II	179.79	1.82	0.07	67
Dasmariñas	Santa Cruz I	262.22	1.80	0.07	66
Dasmariñas	Santa Cruz II	109.67	1.93	0.05	67
Dasmariñas	Santa Fe	323.88	1.90	0.06	68
Dasmariñas	Santa Lucia	283.87	1.76	0.08	74
Dasmariñas	Santa Maria	259.97	1.70	0.09	68
Dasmariñas	Santo Cristo	233.45	1.76	0.08	74
Dasmariñas	Santo Niño I	146.66	1.39	0.16	74
Dasmariñas	Santo Niño II	140.40	2.50	0.01	76
Dasmariñas	Zone I-B	287.00	1.02	0.31	70
Dasmariñas	Zone I	216.42	0.77	0.44	69
Imus	Anabu I-A	321.32	-1.31	0.19	93
Imus	Anabu I-B	131.63	0.08	0.93	79
Imus	Anabu I-C	377.64	0.60	0.55	83
Imus	Anabu I-D	196.36	-0.06	0.95	85
Imus	Anabu I-E	140.09	-0.29	0.77	89
Imus	Anabu I-F	137.22	-0.22	0.83	95
Imus	Anabu I-G	123.98	-0.32	0.75	98
Imus	Anabu II-A	173.48	2.27	0.02	76
Imus	Anabu II-B	392.41	1.60	0.11	54
Imus	Anabu II-C	336.60	1.68	0.09	59
Imus	Anabu II-D	270.48	1.64	0.10	69
Imus	Anabu II-E	284.28	1.23	0.22	74
Imus	Anabu II-F	490.49	0.42	0.67	78
Imus	Bagong Silang	40.42	-0.22	0.83	105
Imus	Bayan Luma I	212.42	-1.02	0.31	104
Imus	Bayan Luma II	83.66	-1.80	0.07	109
Imus	Bayan Luma III	188.36	-2.32	0.02	115
Imus	Bayan Luma IV	138.91	-2.10	0.04	117
Imus	Bayan Luma IX	150.40	-1.36	0.17	118
Imus	Bayan Luma V	238.99	-1.13	0.26	112
Imus	Bayan Luma VI	139.27	-1.02	0.31	105

Imus	Bayan Luma VII	211.95	-0.97	0.33	104
Imus	Bayan Luma VIII	140.40	-1.13	0.26	112
Imus	Bucandala I	509.63	-1.82	0.07	105
Imus	Bucandala II	110.65	-2.11	0.03	85
Imus	Bucandala V	300.34	-1.17	0.24	79
Imus	Buhay na Tubig	2001.06	-1.16	0.25	110
Imus	Carsadang Bago I	915.33	-2.23	0.03	112
Imus	Magdalo	229.75	-1.25	0.21	115
Imus	Maharlika	296.80	-1.57	0.12	116
Imus	Malagasang I-F	540.86	-0.80	0.42	70
Imus	Malagasang I-G	1325.85	-0.45	0.65	64
Imus	Malagasang II-E	121.83	-0.35	0.72	50
Imus	Malagasang II-F	74.94	0.88	0.38	51
Imus	Malagasang II-G	243.09	-0.47	0.64	53
Imus	Mariano Espeleta I	71.81	-1.36	0.17	118
Imus	Mariano Espeleta II	66.68	-1.34	0.18	117
Imus	Mariano Espeleta III	72.99	-1.57	0.12	116
Imus	Medicion I-C	157.22	-2.52	0.01	110
Imus	Medicion I-D	57.66	-2.82	0.00	104
Imus	Medicion II-C	78.89	-2.70	0.01	100
Imus	Medicion II-D	77.92	-2.53	0.01	97
Imus	Medicion II-E	78.23	-2.76	0.01	102
Imus	Medicion II-F	63.30	-2.76	0.01	102
Imus	Palico I	105.98	-2.44	0.01	111
Imus	Palico II	92.38	-1.56	0.12	113
Imus	Palico III	24.78	-1.53	0.13	115
Imus	Palico IV	188.62	-1.53	0.13	115
Imus	Pasong Buaya I	113.83	2.67	0.01	55
Imus	Pasong Buaya II	1826.08	0.73	0.47	81
Imus	Pinagbuklod	92.38	-0.16	0.87	104
Imus	Poblacion I-A	99.98	-2.44	0.01	111
Imus	Poblacion I-B	16.00	-2.26	0.02	113
Imus	Poblacion I-C	13.39	-2.52	0.01	110
Imus	Poblacion II-A	39.55	-2.52	0.01	110
Imus	Poblacion II-B	22.62	-2.52	0.01	110
Imus	Poblacion III-A	55.35	-2.52	0.01	110
Imus	Poblacion III-B	33.55	-2.52	0.01	110
Imus	Poblacion IV-A	73.20	-2.49	0.01	112
Imus	Poblacion IV-B	28.16	-2.47	0.01	111
Imus	Poblacion IV-C	52.22	-2.49	0.01	112
Imus	Poblacion IV-D	57.25	-2.27	0.02	114
Imus	Tanzang Luma I	76.43	-0.16	0.87	99
Imus	Tanzang Luma II	72.48	-0.23	0.81	101
Imus	Tanzang Luma III	102.23	-0.37	0.71	103
Imus	Tanzang Luma IV	120.24	-0.35	0.73	107
Imus	Tanzang Luma V	111.47	-1.26	0.21	115
Imus	Tanzang Luma VI	111.26	-0.50	0.62	110

Imus	Toclong I-A	60.99	-2.82	0.00	104
Imus	Toclong I-B	88.74	-2.91	0.00	108
Imus	Toclong I-C	80.48	-2.91	0.00	108
Imus	Toclong II-A	63.81	-2.76	0.01	102
Imus	Toclong II-B	122.44	-2.86	0.00	105
Kawit	Toclong	1213.10	-2.41	0.02	94
Kawit	Balsahan-Bisita	98.64	-2.32	0.02	87
Kawit	Binakayan-Aplaya	171.58	-2.64	0.01	77
Kawit	Binakayan-Kanluran	129.37	-2.28	0.02	90
Kawit	Congbalay-Legaspi	224.01	-2.55	0.01	83
Kawit	Manggahan-Lawin	238.06	-2.27	0.02	87
Kawit	Pulvorista	610.01	-2.60	0.01	84
Kawit	Samala-Marquez	330.81	-2.19	0.03	88
Silang	Balite I	313.62	-1.18	0.24	14
Silang	Balite II	403.08	-1.35	0.18	13
Silang	Barangay I	255.76	-1.20	0.23	14
Silang	Barangay II	116.95	-1.14	0.25	13
Silang	Barangay III	47.91	-1.14	0.25	13
Silang	Barangay V	404.73	-1.14	0.25	13
Silang	Biga II	235.60	0.39	0.70	17
Silang	Buho	92.13	-1.48	0.14	14
Silang	Iba	148.86	-1.20	0.23	14
Silang	Lalaan I	59.86	-1.30	0.19	16
Silang	Lalaan II	338.60	-1.30	0.19	12
Silang	Malabag	214.84	-1.58	0.11	15
Silang	Malaking Tatyao	98.24	-1.08	0.28	14
Silang	Mataas Na Burol	40.25	-1.30	0.19	12
Silang	Sabutan	339.98	-0.47	0.64	15
Silang	San Vicente II	197.91	-1.20	0.23	14
Silang	Toledo	77.39	-1.58	0.11	15
Silang	Tubuan I	125.05	-1.08	0.28	14
Silang	Tubuan III	50.29	-1.08	0.28	14
Tagaytay City	Kaybagal East	262.28	-1.50	0.13	11
Tagaytay City	Mag-Asawang Ilat	82.33	-1.48	0.14	14
Tagaytay City	Maharlika East	54.53	-1.50	0.13	11
Tagaytay City	Maitim 2nd Central	78.79	-1.56	0.12	13
Tagaytay City	Maitim 2nd West	45.29	-1.56	0.12	13
Tagaytay City	Silang Junction North	127.37	-1.50	0.13	11
Tagaytay City	Silang Junction South	82.48	-1.50	0.13	11

Solid Waste Management Initiatives of the municipalities and cities within the Imus River Watershed

The city of Kawit adopted the Provincial Ordinance no. 007-2012 known as "The selective plastic ban and use of eco bag ordinance in the province of Cavite" in their Ordinance no. 03-12.

Barangay Tanods and Captains are authorized to append and prosecute all violators under the Ordinance no. 07-97 which prohibits the dumping and littering of oil, gas, garbage, soil, sand, gravel and other materials by trucks and other kinds of vehicles and private individuals in all barangay and municipal provincial and national road in Kawit. Penalties will be given and provided in all violators. The city also prohibits littering along public streets, canals, rivers, public utilities and cemeteries, and in other public places.

City Ordinance No. 005 Series of 2014, Mandating the Segregation at Source of all Household, Institutional, Industrial, Agricultural & Commercial Waste & Proper Disposal. Business enterprises encourage to use of recyclable packages, reusable bags, reusable glass wares and utensils. Also, households are required to segregate waste and sell their recyclables.

The Waste Minimization Program of the city launched a series of training seminars in the different barangays, schools and subdivisions. The local government of Imus, in coordination with the civic and religious organizations also launched "Ilog Ko Mahal Ko" campaign which involved the clean-up of the Imus River. Community greening and sanitation were also promoted in the different barangays.

The city also has the Ordinance No. 2012-134 which prohibits the use of plastic bags on dry goods, while regulating its utilization on wet goods. It also prohibits the use of styrofoam/styrophor with prescribed penalties.

According to Ordinance No. 99-006 – Chapter V Section 48 No. 4, all persons are required to dispose of their biodegradable garbage properly and efficiently through individual backyard composting using available non-hazardous method, and recycling through the use of clear production techniques in the case of industries. In line with this, Ordinance No. 4 (Resolution No. 45, Series of 1994) states that market stallholders/owners in wet section of public market are required to put their wastes in a big black plastic bag in their stalls. Market stallholders/owners in public market are also mandated to put up a waste can/basket inside their stalls, measuring 12" x 16" inches.

Vendors within the city of Imus are encouraged to use paper bags instead of plastics in their goods or merchandises.

The city of Imus also urges all elementary and high school students in all public high schools to participate in their “Eco Savers Program.” A government sponsored seminar on proper waste management and business-related regulation is also conducted and all owners/proprietors/designated representative of business and commercial establishments are required to attend as pre-requisites in the issuance of and/or renewal of their business permits and licenses.

Due to significant population growth and development, the city of Dasmariñas has the biggest waste generation, which is being mishandled. The City of Dasmariñas has the largest overall number of large enterprises of all the municipalities. The market is the largest source of biodegradable garbage.

The implementation of Ordinance No. 03-S-2012 otherwise known as the “Ordinance regulating the use of plastic bags and styrofoam in the City of Dasmarińas” is another form of waste reduction particularly of plastic. materials thrown in waterways. It also increases awareness among Dasmarineńos to protect the remaining fresh water resources of the city. Regular Cleaning of waterways in every barangay every Saturday.

City Ordinance No. 06-S-2011 an “Ordinance enacting the Environment Code of the City of Dasmarińas”. It covers all ordinances enacted by the Sangguniang Panglungsod relevant in the protection, conservation, management and wise utilization of the City’s natural resources particularly water, land and air. The purpose of the Code is to protect, conserve, utilize, and manage the environment by integrating, implementing, monitoring, and evaluating programs, projects, and activities on Local Environment Management.

Ordinance No.01-s-2002 entitled “Ordinance prohibiting the littering of garbage in public places in Dasmarińas, Cavite and imposing penalty for violation thereof. The passage of Ordinance No. 06-2-2011 an ordinance enacting the Environment Code of the City of Dasmarińas covers all ordinances enacted by the Sangguniang Panglungsod relevant in the protection, conservation, management and wise utilization of the City’s natural resources particularly water, land and air.

Households are required to segregate their wastes daily as collection is undertaken on a daily basis. Households can sell their recyclables to buy-back center available in their area. Other recyclables collected by the eco-aides are theirs to keep and sell.

Households, commercial and institutional are required to have their own composting pits or drums. Other utilizes food wastes as animal feeds.

Silang Provincial Ordinance No. 007 Series of 2012 prohibiting, regulating. and prescribing certain uses of plastics for goods and commodities that end up as residual wastes and promoting the use of eco bags and other environment friendly practices as an alternative, and providing penalties for violation thereof, the usage of such plastic products was controlled and regulated. The LGU has not strictly imposed a “No Segregation, No Collection” policy to implement the mandatory waste segregation.

Volume of waste generated per day is around 118-120 tons per day, 826 to 840 tons per week, an annual waste of 43,070-43,800 tons per year. The LGU conducted Waste characterization study (WACS) last June, 2015.

Through the women association named MUJERES, they work hand-in-hand with the Barangay for the cleanliness of each barangay and earn funds from the collected recyclables in their respective areas.

According to Kautusang Bayan ML-011, S-99, all residents institutions and commercial establishments, both private and public are to implement zero waste management program. It also aims to implement proper segregation. A resolution authorizing permitting procedures for solid waste facilities as well as inspection and compliance procedures is also present in this city.

Households in the city of Silang has been mandated to take out their garbage in any form only on the day of collection. Proper waste segregation should be implemented in all households.

The City of Tagaytay also conducts Annual Search for the Cleanest, Greenest and Healthiest Barangay aimed of promoting proper solid waste management in every barangay. With the current trend of the city’s development and influx of local tourist together with the booming economic activities. The City Government must exert efforts to address the following issues and concerns; a. Poor Segregation at Source and segregated collections. b. Lack of environment c. Lack of Community-based initiative to environmental Protection d. Lack of an effective and safe collection and disposal system for Special Wastes. e. Un-sustained Community Material Recovery Facilities as Mandated in Solid Waste Management Act. f. Lack of Sanitary Landfill.

The City Government of Tagaytay, in collaboration with the barangays, private sector, and business sector, has undertaken steps to mitigate the negative effects of inappropriate solid waste disposal in the City. These include a massive campaign on solid waste reduction, recycling, and re-use. Composting, re-use, and recycling of solid waste are practices used by certain houses in the barangay. Also, has an annual search for the cleanest, greenest, and healthiest barangay in the city, with the goal of encouraging appropriate solid waste management in each barangay.

To achieve the goal of trash reduction, the City Council established several ordinances that have been implemented throughout the city. City Ordinance No. 2011-025 “An ordinance prohibiting the use of plastic bags on dry goods, regulating the utilization of plastic on wet goods, prohibiting the use of styrofoam within the City of Tagaytay and prescribing penalties thereof.”

Strict implementation of the Municipal Environment Code including regulation in the use of plastics with alternative use of Bayong and Eco-bag, likewise, students and other members of society are encouraged to bring household utensils like spoon and fork instead of plastic disposables. In offices and institutions, the use of back page of each document to minimize the consumption of paper and other materials while non confidential used papers are (not crumpled) are properly collected then sold in volume to recyclers.

Recyclables waste materials should be taken to the Materials Recovery Facility (MRF) in every barangay or cluster of barangays where they are received, sorted, processed and stored efficiently and in an environmentally sound manner. Compostable waste on the other hand should be composted either in the backyard or in the community composting site. Hazardous wastes are further screened and sent to appropriate hazardous waste treatment plant.

The Executive Order 2016-014 constitutes the Municipal ecological solid waste management board in the municipality of Amadeo.

Metallic foils

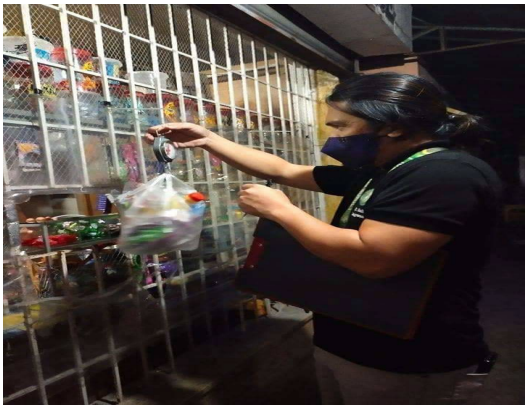
Polypropylene-based wastes

Plastic wastes

Composite waste

Samples of recyclable and residual wastes

Brgy. Maitim 2nd Central, Tagaytay City

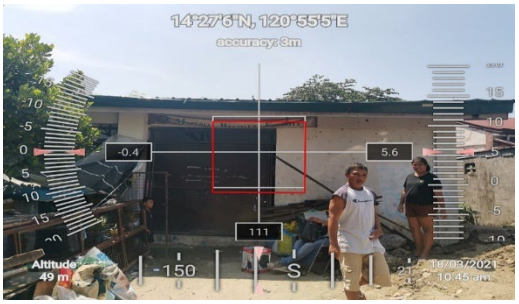


Brgy. Burol 1, Dasmariñas, City

Brgy. Mabolo 1, Bacoor City

Brgy. Mabolo 1, Bacoor City

Weighing of plastic wastes in the selected barangays within the cities and municipalities within the Imus River Watershed



Brgy Binakayan - Aplaya, Kawit

Brgy. Molino III, Bacoor City

Brgy. Mariano - Espeleta, Imus City

Brgy. Salawag, Dasmariñas City

Brgy Balite II, Silang

Brgy. Amadeo

Brgy. Silang, Crossing East, Tagaytay City

Location of the MRRs, MRFs, and SLFs throughout the watershed