

Volume IV: Case Studies

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1. Case Study I

1.1 Outline of Case Study I (Recyclables Collection)

The outline of the Case study I is summarized in the table below.

Table 1.1.1 Outline of Case Study I

Title of the Study	Recyclables Collection Case Study
Study Period	6 months (July to December 2007)
Study Area	<ul style="list-style-type: none"> ▪ <u>Residential area</u>: Gawad Kalinga Pinagsama Villages (Western Bicutan, Taguig), Bgy. UP Campus (Quezon City) ▪ <u>Office building</u>: Benpres Building (Bgy. San Antonio, Pasig City), Commission on Human Rights (Bgy. UP Campus, Quezon City) ▪ <u>Commercial establishment</u>: SM City Sta. Mesa Food Court (Bgy. Santol, Quezon City) ▪ <u>School</u>: New Era High School (Bgy. New Era, Quezon City)
Target stakeholders	<p>Awareness raising: communities, business establishments (private / public), and schools</p> <p>Collection/recycling: collection/transportation agents, dealers, and industries utilizing recyclable materials</p>
Target recyclables	Papers, Plastics (general types of plastics), Metals (tin and aluminum cans), and Glass
Purpose of the Case Studies	<ol style="list-style-type: none"> (1) Analysis on the impact/result of the proper segregation practice among the target parties through awareness raising activities using the materials developed under the study. (2) Review and assess the possibility of developing ‘segregation at source/ collection/ recycling system’ in urban areas.
Main activities	<ol style="list-style-type: none"> (1) Identification of actual recyclable collection practices in the study areas. Identify amount of collected recyclables, which will be used as the base line data in the study areas. (2) Development of educational / publicity materials for awareness raising. Develop “educational / publicity materials” to promote proper segregation of recyclable materials for target communities, business establishments, and schools. (3) Conduct awareness raising activities using the educational/publicity materials developed. By using the educational / publicity materials developed, carry out awareness raising activities for ‘proper segregation’ for communities, business establishments, and schools in the study areas. (4) Development of a recyclables collection plan based upon ‘waste segregation at source’ in the study areas. Develop and review the recyclables collection plan, and determine the ‘methods of waste segregation at source’, ‘collection methods’, and ‘recycling methods or finding final user of the material’. (5) Implementation of the recyclables collection plan. Based upon the recyclables collection plan developed, carry out recyclables materials collection. Record the cost and/or volume of collection / transportation / processing. Data will be used for analysis / evaluation of possibility of development of the recycling system. Duration of this activity is 3 months.

	(6) Analysis and evaluation of the recyclables collection activity. Based on the data collected, compare and evaluate the waste segregation practices or recyclable materials collected from the target entities before and after the awareness raising activities. Furthermore, analyze and evaluate the conditions, issues, and/or economic feasibility of the recycling system.
Expected Outcomes	(1) Proper waste segregation at source will be promoted through awareness raising. (2) Conditions and feasibility of recycling system development in urban area will be identified.
Other information	When implementing the case study, obtain cooperation from industrial associations that include TWG members in each recyclable material type, as well as barangays and LGUs.

1.2 Recyclables Collection in Gawad Kalinga Pinagsama

1.2.1 Current Conditions and Issues

(1) Site profile

Gawad Kalinga (hereinafter referred to as GK) is the NPO whose mission is to provide dignity and peace for every Filipino through providing land for the landless, homes for the homeless, and food for the hungry. GK has been coordinating the development of Pinagsama Villages; beneficiaries (those who are going to move in the new houses constructed by the GK projects) and volunteers have been engaged in the construction work for the village development. Residents of the GK Pinagsama Village are expected to move into the new houses from the middle of August 2007. Residents of the GK Pinagsama Village are considered as low-income households, and their surrounding area is resided by middle-income households. The site profile is summarized in Table 1.2.1, and some pictures representing the site are shown below.

Table 1.2.1 Profile of Gawad Kalinga Pinagsama

Location	Western Bicutan, Taguig
Size	58 households distributed in two adjacent villages (Poveda and Fuji Xerox, named after the sponsors)
Community organization	GK Pinagsama caretaker is assigned.
Reasons for being selected as case study site	<ul style="list-style-type: none"> • Community organization is present (easy to organize activities). • It is highly replicable for other GK sites. • Manageable size. • Families are just starting to move in (no existing waste segregation / recyclables collection system). • Low-income area (the other site for residential areas is classified as middle-income).



Construction of the Housing



Planned Area for Composting



(Storage Space for Recyclables)

Common Space for Four Households



Planned Area for Recyclable Storage Facility



Typical house in which a prospective resident is currently living



River next to the site (covered with plastic bags)

(2) Waste Management Practices

Waste management practices in the GK Pinagsama Village as of August 2007 are summarized in Table 1.2.2.

Table 1.2.2 Waste Management in GK Pinagsama Village before the Case Study

Recyclables Volume/Characteristics	<ul style="list-style-type: none"> • Prospective residents may generate tin cans and glass bottles (but not PET bottles). • Volunteers or visitors bring in a lot of PET bottles
Solid Waste Management	<ul style="list-style-type: none"> • The municipal government collects household wastes irregularly. • Since squatters do not use trashcans, they put garbage in a plastic bag and tend to throw it into the nearby river, which is consequently filled with plastic bags (see the picture above). • There is no existing MRF in the village, but one composting area and a small recyclable storage facility (RSF) are to be established. • There is no internal system for recyclables collection (because residents have just moved in), but each of four households (one unit) is expected to take turns weekly to bring their recyclables to the RSF to be established in the village.

1.2.2 Needs Assessment

The needs of GK Pinagsama Village in the field of solid waste management were identified at the focus group discussions as follows:

- a. GK leaders mainly just want to have a livable environment free of litter.
- b. GK leaders admit that their knowledge on waste segregation is limited, and that it is not yet a standard practice in their villages.
- c. They want a program that is easily replicable, is aesthetically pleasing, and promotes values such as cooperation with one’s neighbors, etc.
- d. They wish to have centralized collection and selling of recyclables that the community would be able to benefit from.
- e. They want assistance in establishing their composting facility.
- f. As for the garbage in the creek beside the villages, they do not see this as something they could address because they identify that the source of the solid waste is from upstream sources.

1.2.3 Recyclables Collection Plan

(1) Expected Outcomes and Activities

Based on the above needs assessment, expected outcomes and corresponding activities are planned as in the following table.

Table 1.2.3 Expected Outcomes and Activities in GK Pinagsama Village

Expected Outcome	Activity
The GK Pinagsama residents are conducting waste segregation at a household level	<ul style="list-style-type: none"> • Provide the residents with one waste segregation frame including a pail for food wastes and hooks for bags to contain dry wastes (recyclables and residuals) per 4 housing units. • Provide the residents with a poster indicating proper waste segregation per 4 housing units, integrated in the frame. • Give the residents instructions on proper waste management. • Provide the residents with a handbook on solid waste management (management of recyclables).
The GK Pinagsama Village has a facility to store segregated recyclables at a community level	<ul style="list-style-type: none"> • Confirm the construction of a recyclable storage facility (RSF) with the GK caretakers. • Provide the GK Pinagsama Village with a weighing scale and cabinets for waste paper storage. • Put posters reminding the residents of places for each type of recyclables in RSF.

Wastes in GK Pinagsama will be handled as follows:

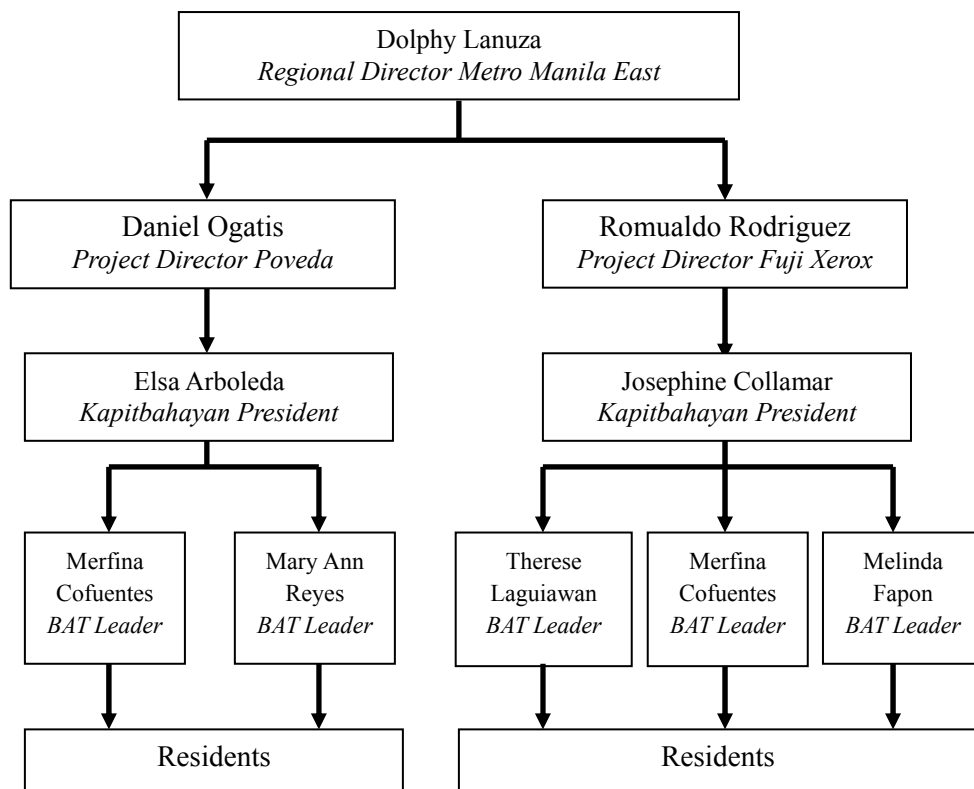
Table 1.2.4 Ways to Handle Wastes at GK Pinagsama Village by Waste Type

Type of Solid Waste	Kitchen Waste	Biodegradable Waste (leaves, plants)	Recyclables	Residuals
Intermediate Container	Compostables container in common area	-	-	Residuals container in common area
Person Responsible for placing waste in correct container	Assigned collector	Household	Household	Assigned Collector
Schedule of Intermediate Collection	Daily; and immediately as needed	Immediately as needed	Immediately as needed	Daily; and immediately as needed
End Destination of Solid Waste	Compost pit near creek	Compost pit near creek	Recyclables storage area	Municipal residuals waste truck; future proposed community residual bin (locked)
Person Responsible for Transfer of Waste to End Destination	Assigned collector	Household	Household	Assigned collector
Schedule of End Collection	Daily	Daily	To be coordinated with GK administration for selling to junkshop	Upon arrival of Municipal Truck

(2) Structure for Implementation

The solid waste management committee, which is based on the existing GK Kapitbahayan or the neighborhood association, implements the segregation/collection of recyclables. The solid waste management committee has the structure as shown in Figure 1.2.1. The Regional Director and the Project Director, also known as Caretakers, are members of Couples for Christ, while the Kapitbahayan President and the Bayanihan Action Team (BAT) are from the beneficiaries or residents. The Regional Director will serve as the Solid Waste Management Committee Head. The Project Directors will be the coordinators of each of the villages, and they will be assisted by their respective Kapitbahayan Presidents. The BAT leaders will be the coordinator to the residents; each BAT handles 5-7 households.

The set-up of the houses of the GK Pinagsama Village is that four houses or a cluster share a common area which is use for laundry. The segregation bins will be placed within the common areas. As participation for the residents, an “Assigned Collector” will be selected every week and will be responsible for the segregation bins. The assignment will be in rotation so that each household will participate. The Aviary / RSF Caretaker will also be in rotation and shall be in-charge of the Aviary and Recyclables Storage Facility.



Note: BAT: Bayanihan (Cooperation) Action Team

Poveda and Fuji Xerox: Sponsors to GK Pinagsama

Figure 1.2.1 Implementation Structure in GK Pinagsama Village

1.2.4 Achievement

(1) Implementation Schedule

The abovementioned activities were implemented by the following schedule.

Table 1.2.5 Activity Schedule in GK Pinagsama Village

Schedule	Activities
23-29 Sep. 2007	<ul style="list-style-type: none"> Finish Solid Waste Management and Collection Plan proposals, and discuss with key persons for approval Finished construction of Recyclables Storage Facility
30 Sep.-14 Oct. 2007	<ul style="list-style-type: none"> Design, procurement and preparation of IEC materials and infrastructure
21-27 Oct. 2007	<ul style="list-style-type: none"> Approval of a prototype waste segregation bins
Nov. 3, 2007	<ul style="list-style-type: none"> Delivery of cabinets for RSF
Nov. 5, 2007	<ul style="list-style-type: none"> Training of residents regarding proper waste segregation via segregation activity (game) during the launching Installation of waste segregation frames and posters House to house visits Implementation of Solid Waste Management and Collection Plan in GK Pinagsama Village Start of monitoring.
05-17 Nov. 2007 until the end of December	<ul style="list-style-type: none"> Monitoring Documentation

(2) IEC Materials and Equipment Distributed

The IEC materials and equipment distributed are summarized in Table 1.2.6.

Table 1.2.6 IEC materials and Equipment Distributed in GK Pinagsama Village

Area	Container / IEC Material	No. of Units	Notes
Common area of the cluster (4 housing units)	Waste segregation frame	20	Includes a kitchen waste pail and hooks for garbage bags, recyclables net bag
	Poster on waste segregation	20	Part of the waste segregation frame
Recyclables Storage Facility (Located at Poveda Village)	Paper cabinet (papers, newspapers, cartons)	2	One shelf per village
	Sacks (for other recyclables)	7	
	Weighing Scale	1	
Poveda and Fuji Xerox Village offices	Program poster	2	

(3) Outcomes

All the residents have moved into the new houses by the end of November 2007. Each of the four units has been provided with a segregation frame with a pale for food waste and hooks for bags (see the picture “Waste Segregation Frame with Poster” below). The community has

established a recyclable storage facility (RSF) in their premises, and each household takes turn to transferring the recyclables from the unit courtyard to the RSF every week. Although there is a plan to compost organic wastes generated from the residents in the community, and the composting box has already been constructed, actual composting has not started. The organic waste has not been collected for composting but disposed separately from residual waste for municipal waste collection.



Completed Housing



Completed Housing



Focus Group Discussion



Recyclables Storage Facility



Waste Segregation Frame with Poster



Composting Box under Construction



The following Table 1.2.7 shows the breakdown of the various types of recyclables that the GK community sold. These covered a period of 4 months and were sold thrice to the junkshop located beside the creek. However, most of the recyclables are still in the MRF and have yet to be weighed, waiting for bulk selling. Some residents were also observed to sell their recyclables directly to the junkshop, which is not part of the GK policy, but some BAT leaders allow it since they know that some households are in dire need of added income. Note that the prices of the junkshop sometimes varied throughout the course of the 4-month period.

Table 1.2.7 Volume and Value of Recyclables Collected at GK Pinagsama Village during the Case Study (in 4 months)

Item	Weight (kg)	Unit Price (PhP/ kg)	Value (PhP)
Cartons	32.75	3-4	32.00
PET	8	21.25	170.00
HDPE "Sibak"	3.75	16.00	216.80
Tin cans	11	3-4	42.00
Bottles (lump)	143	-	158.00
Shards "bubog"	10.75	-	6.34

1.3 Recyclables Collection in UP Bliss

1.3.1 Current Conditions and Issues

(1) Site Profile

UP Bliss is one of the housings for those who work at the University of the Philippines. UP Bliss is composed of 11 residential buildings, and one of them is selected as the case study site. Each building has one janitor who collects household waste every day. The site profile is summarized in Table 1.3.1, and some pictures representing the site are shown below.

Table 1.3.1 Profile of UP Bliss

Location	Building 8, Pook Sikatuna BLISS, Brgy. UP Campus, Quezon City
Size	11 housing complexes (32 households in four floors per one building)
Community organization	<ul style="list-style-type: none"> • There are two Pooks (community unit under Barangay) in Brgy. UP Campus. One is Sikatuna Bliss (middle-income area) in which the case study site is located, and the other is Libis (low-income area), in which Pook level MRF is located.
Reasons for being selected as case study site	<ul style="list-style-type: none"> • Since one of the targeted residential areas is low-income (GK Pinagsama), middle-income target site was appropriate. • Among the 11 residential buildings, a janitor at the targeted building is the only one who recovers recyclables. • Building 8 is where the Barangay Coordinator for UP Bliss was residing and it was recommended for ease of coordination. • Manageable size, volume and area. • The experiences in this site can be replicated in other Buildings of the Sikatuna BLISS apartment-type housing.



UP BLISS Housing Complex



Waste Cart on the Hallway



Carts Used for Waste Collection



Sorted Recyclables at BLISS MRF



(2) Waste Management Practices

Waste management practices in the UP Bliss as of August 2007 are summarized in Table 1.3.2.

Table 1.3.2 Waste Management Practices in UP Bliss before the Case Study

<p>Recyclables Volume/Characteristics</p>	<ul style="list-style-type: none"> Residents generate papers, PET bottles, aluminum cans and glass bottles. All the recyclables are mixed with biodegradable wastes and other garbage in plastic bags. Roughly 2-3 small plastic bags per unit per day or one “kariton (waste push cart)” per day
<p>Solid Waste Management</p>	<ul style="list-style-type: none"> There is one waste bin (cart) at the hallway on each floor brought by the Eco-aide. Residents throw their garbage into the waste bin or the Eco-aide goes up the floors to get their garbage. The collector moves the waste bin to Libis MRF (Pook level MRF) every day. Each household pays Php40 of waste collection fee every month. Half of the fee is paid to a collector, and the rest goes to livelihood program of the people’s organization (SKPK) to which they are members of; therefore, residents in UP Bliss think that it is the collector that should segregate their wastes. The collector receives about Php 1,200 for waste collection every month. In addition, the collector of Building 8 earns about Php 4,000 to 5,000 per month for selling recyclables he recovers from the waste bin and other parts of the premises. This is not necessarily the case for the other collectors. There are two MRFs in Brgy UP Campus; one is MRF Libis (Managed by the People’s Organization), and the other is the Village A MRF (managed by the Barangay). About three people are working at the Libis MRF as sorters, and five people at the Village A MRF. The workers at the MRFs are paid by the Barangay. The Libis MRF sells their recyclables to the Brgy level MRF. Proceeds from the selling are divided in half; the amount collected from the recyclables is not based on the weight but by estimation by visual observation.

1.3.2 Needs Assessment

The needs of UP Bliss in the field of solid waste management were identified at the focus group discussions as follows:

Stakeholder	Needs
Barangay	<ul style="list-style-type: none"> • Bgy. Captain wants to end the formation of a dumpsite within the Libis MRF compound. • The Libis MRF only accommodates solid waste from UP BLISS and not from junkshops or the Libis community. • Segregation at the household level.
People's Organization (Sagisag ng Kaalaman Para sa Kaunlaran, or SKPK) who manages the Libis MRF and Eco-aides	<ul style="list-style-type: none"> • The Libis MRF should be self-reliant in terms of management and recyclables trade. • Eco-aides are to continue their collection from the BLISS residents with the same collection fee as before. • Proceeds from recyclables selling be allotted partly for maintenance of the Libis MRF aside from going to the 2 personnel who sort the recyclables according to type. • Education regarding the laws on solid waste management. • Organizational strengthening (formalization, IDs, guidelines). • Equipment and safety materials. • Assistance in talking to the BLISS residents to segregate biodegradable vs. non-biodegradable (some have mixed feelings about the segregation according to biodegradable vs. recyclable vs. residual because they feel that the recyclables will already be sold by individuals from BLISS and thereby lessen their source of livelihood).
Quezon City Environment Protection Waste Management Department	<ul style="list-style-type: none"> • Segregation at the household level according to biodegradable, recyclable and residuals. • Residuals to be collected only on Tuesdays and Fridays, and will be given directly to the trucks. • No accumulation of residuals for more than 24 hours.
BLISS Residents	<ul style="list-style-type: none"> • As long as their garbage is collected everyday they have no major concern. • Do not want to segregate because they pay collection fees.

After the FGDs were conducted, the Barangay Captain requested the deployment of trucks from the QC EPWMD to haul the mounting garbage pile at the Libis MRF. Collection was to be temporarily handled directly by the barangay, while collection by the Eco-aides would cease momentarily while a new collection plan is to be drafted. These actions were done independently by the Barangay in their prerogative and capacity as the local government unit head, and did not involve the case study team. While this addressed the problem of the garbage heap in the Libis MRF, there were many misinterpretations brought about by this action. These events occurred a month before the scheduled barangay elections in late October 2007, and were used by political rivals to campaign against the incumbent barangay captain. Conflicts arose between the councilor currently handling the Solid Waste Management Committee, the Barangay Coordinator for UP BLISS, the BLISS homeowners' association, and the SKPK. The Eco-aides interpreted it as an immediate threat to their livelihood, because rumors have spread that the Libis MRF operations would be stopped permanently. Because of these events, the case study team reassessed their strategy for the area and focused on conflict resolution first between the barangay and the SKPK/ Libis MRF Eco-aides.

The interventions now focused on organizational strengthening of the Eco-aides and equipping SKPK more knowledge and skills on waste management. This was done by the case study team together with the QC EPWD. Dialogues and IEC activities at the mid-income housing of UP Sikatuna BLISS were then put on hold until after the elections and designation of possibly a new SWMC head from the new barangay council.

1.3.3 Recyclables Collection Plan

(1) Expected Outcomes and Activities

Based on the above needs assessment, expected outcomes and corresponding activities are planned as in the following table.

Table 1.3.3 Expected Outcomes and Activities in UP BLISS

Expected Outcome	Activity
The Eco-aides (waste collectors) are conducting safe waste collection and segregation	<ul style="list-style-type: none"> • Prepare a handbook on solid waste management and health and safety risk. • Train the Eco-aides on safe and proper waste collection and segregation with the above handbook. • Provide the Eco-aides with gloves and aprons.
The Libis MRF keeps recyclables at good condition and records of recyclables sold	<ul style="list-style-type: none"> • Provide the Libis MRF with a weighing scale, a blackboard, and a storage crate for recyclables. • Train the representative of the People's Organization to keep records.
A system to monitor waste segregation at source (household level) is established	<ul style="list-style-type: none"> • Educate the Eco-aides on the importance of waste segregation at source. • Authorize the Eco-aides as a personnel to inform the UP BLISS residents of proper waste segregation. • Formalize the Eco-aide organization by formulating Guiding Rules & Regulations.

Wastes in UP Bliss will be handled as follows:

Table 1.3.4 Ways to Handle Wastes in UP Bliss

Type of Solid Waste	Kitchen Waste	Biodegradable Waste (Leaves, plants)	Recyclables	Residuals
Intermediate Container	Compostables container in kitchen area per household	-	-	
Person Responsible for placing waste in correct container	Household	Household	Household	Household
Schedule of Intermediate Collection	Daily; and immediately as needed	Daily	Daily	Tuesdays and Fridays only
End Destination of Solid Waste	Pig dealers/ compost pit at Barangay Village A MRF	Pig dealers/ compost pit at Libis or Barangay Village A MRF	Recyclables storage area at Libis MRF	QC EPWMD truck to dumpsite

Type of Solid Waste	Kitchen Waste	Biodegradable Waste (Leaves, plants)	Recyclables	Residuals
Person Responsible for Transfer of Waste to End Destination	Eco-aides	Eco-aides	Eco-aides	Eco-aides
Schedule of End Collection	Daily	Daily	Libis MRF will sell directly to accredited junkshop after sorting and weighing	Tuesdays and Fridays

(2) Structure for Implementation

The Organizational Chart for Implementation of Solid Waste Segregation and Collection Scheme is shown Figure 1.3.1, wherein the Barangay Captain shall be the head of the organization. Various stakeholders involved in solid waste management shall be represented. These include the Kagawad for Solid Waste Management, Libis MRF Management, Eco-aide Representative, Bliss Coordinator and the Representative from the Quezon City Environmental Protection and Waste Management Department.

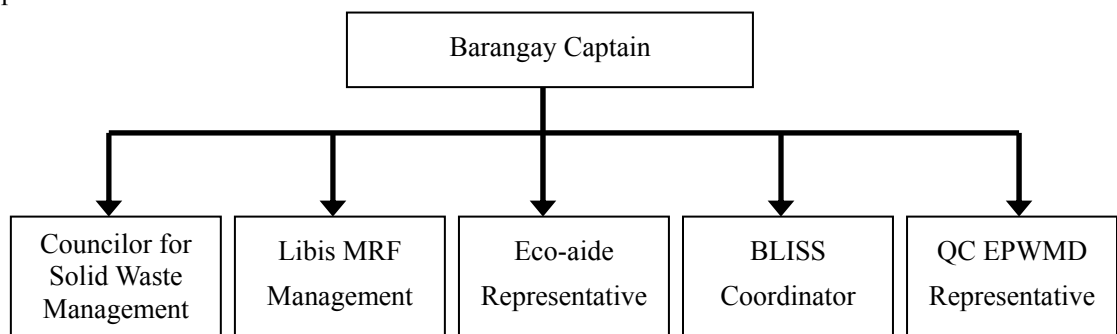


Figure 1.3.1 Implementation Structure in UP Bliss

1.3.4 Achievement

(1) Implementation Schedule

The above-mentioned activities were implemented as in the schedule below.

Table 1.3.5 Activity Schedule in UP Bliss

Schedule	Activities
23-29 Sep. 2007	<ul style="list-style-type: none"> Dialogues, conflict resolution and negotiations among Barangay Officials, Libis MRF, and QC EPWMD.
30 Sep.-14 Oct. 2007	
14-20 Oct. 2007	
21-27 Oct. 2007	
28 Oct. – 3 Nov. 2007 <i>(Barangay Elections)</i>	<ul style="list-style-type: none"> Design, procurement and preparation of IEC materials.

Schedule	Activities
4-10 Nov. 2007	<ul style="list-style-type: none"> Organizational strengthening, rules and regulations formalization. Start of monitoring of recyclables sold.
11-17 Nov. 2007	<ul style="list-style-type: none"> Finalize Solid Waste Management and Recyclables Collection Plan and Eco-aide Rules and Regulations, and discuss with new barangay officials and QC EPWMD Dialogues with UP Sikatuna BLISS Management.
18-24 Nov. 2007	<ul style="list-style-type: none"> Creation of logo, picture taking for Ids. Painting of pushcarts. Capacity training of Libis MRF Eco-aides regarding proper recyclables sorting, weighing, and safety.
25 Nov.- 1 Dec. 2007	<ul style="list-style-type: none"> Deployment of materials, safety gloves, weighing scale, and blackboard.
02-09 December 2007	<ul style="list-style-type: none"> Deployment of food waste pails.
Dec. 16, 2007	<ul style="list-style-type: none"> Year-end meeting. Recycling film showing. Distribution of IDs. Meeting with UP BLISS Building Coordinators and Barangay representatives.
06-12 Jan.	<ul style="list-style-type: none"> Deployment of aprons with SKPK logo.

(2) IEC Materials and Equipment Distributed

The IEC materials and equipment distributed in UP Bliss are summarized in Table 1.3.6.

Table 1.3.6 IEC Materials and Equipment Distributed in UP Bliss

Area	Container / IEC Material	No. of Units	Notes
Per Sikatuna BLISS Building	Kitchen waste pail	11 (1 per Eco-aide)	With Eco-aide in their collection cart
	Poster on household wastes	11	To be posted in common area
Libis MRF	Storage crates	2	
	Blackboard for accounting, signing out of pushcarts	1	Libis MRF Eco-aides and sorters
	Weighing scale	1	
	Calculator	1	
	Paint and paint brushes for pushcarts		
	Template for accounting		
Eco-aides and sorter	IDs for Eco-aides	11 pieces	
	Aprons	11 pieces	
	Rubber Gloves	13 pairs	
	Rubber Boots	2 pairs	

(3) Outcomes

The Eco-aides started using gloves and aprons for waste collection. The Libis MRF started keeping records (weight and price by type) of recyclables sold. All the Eco-aides have been given the ID authorized by the Barangay Captain as personnel to monitor waste segregation at segregation level.

Although it is not a part of the case study activities, the Barangay to which the UP BLISS belongs has also started awareness raising activity for the promotion of waste segregation and recycling at household level (see the picture “Awareness Raising Team” below).



Focus Group Discussion



Focus Group Discussion



Storage for Recyclables



Blackboard for Communication and Recording



Segregation of Recyclables at Libis MRF



Bin for Food Waste



The following table shows the volume and price of recyclables collected at Libis MRF and Barangay MRF before the case study.

Table 1.3.7 Volume and Price of Recyclables Collected at UP BLISS before the Case Study

Recyclable	At Libis MRF	
	Volume* (monthly collection)	Value**
White Paper	1 sack	6.00/ kg
Newspaper/ Colored	12 sacks	0.50 – 2.00/ kg
Cartons		
Assorted waste paper	1 sack	
Plastic PET	4 sacks	18 (dirty), 20 (clean)/ kg
Plastic hard	3 sacks	12/ kg
Aluminum Cans		
Tin Cans	10 sacks	3/kg
Glass		0.50 – 3/ piece

* All recyclables gathered at Libis MRF given to larger MRF to sell; no weights measured.

** Prices based on personal knowledge of segregator.

The Libis MRF was able to sell their recyclables roughly every 3-4 weeks. All transactions were properly documented, and the data are based on actual selling prices of the junkshops they have done business with. The following table shows the breakdown of the different types of recyclables collected by the Libis MRF.

Table 1.3.8 Volume and Price of Recyclables Collected at Libis MRF during the Case Study

Item	Weight (kg)	Unit Price (PhP/ kg)	Revenue (PhP)	Daily Avg. (kg/day)
White paper	89.5	8.00	694.00	0.79
Newspaper	65.5	5.00	327.50	0.57
Cartons	423	4.00	1,692.00	3.71
Assorted paper	760	1.00	777.00	6.67
PET	56	18.00	1,008.00	0.49
HDPE "Sibak"	138.5	15.00	2,077.50	1.21
Plastic cups	77.5	10.00	775.00	0.68
Aluminum cans	5	55.00	275.00	0.04
Tin cans	462.5	5.00	2,312.50	4.06
Bottles (lump) - assorted pcs	342		142.40	
Shards	161	0.50	80.50	

1.4 Recyclables Collection in Benpres Building

1.4.1 Current Conditions and Issues

(1) Site Profile

Benpres Building is an office building with tenants related to Lopez Group including a TV network and a power company. Some companies have their own canteens while there is a common canteen on the 5th floor for the employees who work for the companies that do not have a canteen. The site profile is summarized in Table 1.4.1, and some pictures representing the site are shown below.

Table 1.4.1 Profile of Benpres Building

Location	Bgy. San Antonio, Pasig City
Size	700 employees 1 building, 6 floors (18,000 sq.m.), 22 offices
Management organization	Administration office of Benpres Building is in charge of waste management in the building. Each office (tenant) has one janitor, and there are several janitors not associated with office (clean up common areas).
Reasons for being selected as case study site	<ul style="list-style-type: none"> The management of the Benpres Building is very supportive of the case study. Manageable size, volume and area.



Overview of the Building



Waste Bin for Segregation



Recyclables Sold to Junkshop



Recyclables Stored at Junkshop



Bin for Recyclables at Canteen Kitchen



Inside the Bin for Recyclables

(2) Waste Management Practices

Waste management practices in Benpres Building as of August 2007 are summarized as follows:

Table 1.4.2 Waste Management in Benpres Building before the Case Study

Recyclables Volume/Characteristics	<ul style="list-style-type: none"> • Significant volume of used paper, some PET bottles and aluminum cans are generated. • Recyclables are mixed with food residues in the offices.
Solid Waste Management	<ul style="list-style-type: none"> • The building does not have a solid waste management plan. • Janitors recover recyclables from waste bins in the offices, store the recyclables in their storage for clean up tools, and sell them to a junkshop who comes to the building every week. The storage is too small to conduct sorting of recyclables. • Some offices order their janitors to store recyclables in the basement storage of their office, and profits from selling the recyclables go to the office administration. • There is a communal canteen on the 5th floor. The canteen workers sometimes take food waste back home for their pets. Hard plastics, PET bottles, and aluminum cans generated in the canteen are segregated in the kitchen and sold to a junkshop by the canteen workers. • There is a large waste bin separated into three cells with different color lids (blue, yellow and red). This waste bin was originally established for segregating recyclables, biodegradable, and non-biodegradable, but it has not been utilized yet (wastes are all mixed). This is partly because the city garbage truck does not have separate rooms for segregated wastes. • Some offices already have their own waste segregation schemes; however, this is not uniformly implemented in all the offices. • Many of the offices do not have waste bins for segregation (wet and dry wastes are all mixed).

1.4.2 Needs Assessment

The needs of Benpres Building were identified during the focus group discussions as follows. Major issue in the Benpres Building is to improve processing of recyclables, especially paper waste.

- a. Major issue in the Benpres Building is to improve waste management efforts for recyclables, especially for waste papers.
- b. Building administration wants a centralized and daily collection/storage of the food-contact recyclables to reduce pestilence.
- c. Administration also wants safer storage of paper recyclables to reduce fire risk
- d. Janitors also wish to have better segregation by office employees to reduce efforts in segregation after collection from waste bins

1.4.3 Recyclables Collection Plan

(1) Expected Outcomes and Activities

Based on the above needs assessment, expected outcomes and corresponding activities are planned as in the following table.

Table 1.4.3 Expected Outcomes and Activities in Benpres Building

Expected Outcome	Activity
Recyclables are recovered from waste bins with higher quality (not contacted with food waste)	<ul style="list-style-type: none"> • Issue a policy to promote waste segregation at the tenant offices from the Benpres Building Administration. • Put posters calling for waste segregation in the offices.
Food leftovers are segregated from recyclables and residuals at offices pantries	<ul style="list-style-type: none"> • Same as above. • Provide office pantries with waste segregation bins.
Recyclables are collected and brought daily to common storage areas	<ul style="list-style-type: none"> • Hold meetings with janitors for the change of the recyclables collection and storage practices. • Activate the use of existing waste segregation bin in the parking lot (for cans, plastic and glass bottles). • Establish a storage for waste paper in the basement. • For proper accounting of the “ownership” of these recyclables, a representative of the junkshop would be there daily to weigh record and monitor proper sorting of said recyclables.

(2) Structure for Implementation

Within Benpres Building, the Benpres Building Administrator coordinates activities under the case study with relevant stakeholders. Benpres Building Coordinating Committee (BBCC), which is an existing organization of Benpres Building composed of representatives from different offices and convenes on a monthly basis, coordinates with tenant offices. Southbend Janitorial Services dispatch janitors to the tenant offices and coordinates with the junkshop. The cafeteria concessionaires have their own contract with other junkshop for selling recyclables. Pasig CENRO/SWMO is in charge of collection and treatment of household wastes and contracts out the management to Ortigas Center Association, Inc. (OCAI). OCAI then contacts the Bagayawa garbage collection trucks and schedules the collection within the Ortigas Center. Bagayawa is under the larger IPM collection company servicing Pasig City.

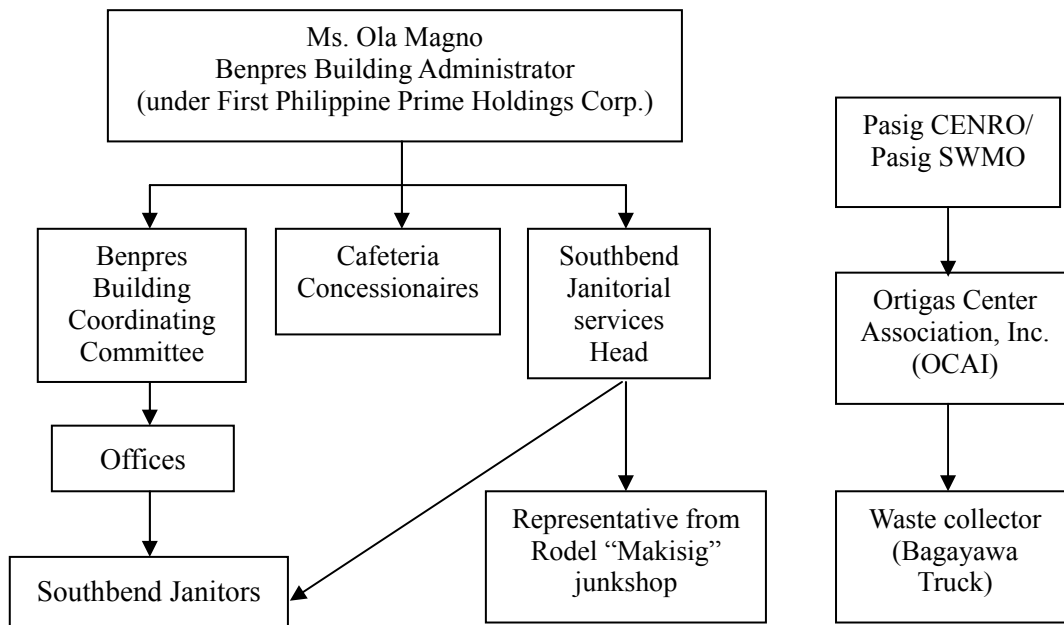


Figure 1.4.1 Implementation Structure in Benpres Building

1.4.4 Achievement

(1) Implementation Schedule

The abovementioned activities were implemented as in the schedule below.

Table 1.4.4 Activity Schedule in Benpres Building

Schedule	Activities
5-9 Nov. 2007	<ul style="list-style-type: none"> • Finish Solid Waste Management and Collection Plan proposals, and discuss with key persons for approval.
12-16 Nov. 2007	<ul style="list-style-type: none"> • Design, preparation, procurement and installation of IEC materials and infrastructure. • Presentation of SAGIP Environment, Pasig CENRO/SWMO and OCAI to BBCC, and planning for launching of program.
Nov. 28, 2007	<ul style="list-style-type: none"> • Installation of kitchen waste pails and IEC posters for offices. • Training on proper waste segregation. • Implementation of Solid Waste Management and Collection Plan in Benpres. • Start of monitoring.
28 Nov. 2007 until end of December 2007	<ul style="list-style-type: none"> • Monitoring. • Documentation.

(2) IEC Materials and Equipment Distributed

The IEC materials and equipment distributed in Benpres Building are summarized in Table 1.3.6. In addition, Benpres Building has started utilizing the existing waste bin for segregation for the original purpose and established a storage room for collected waste papers.

Table 1.4.5 IEC Materials and Equipment Distributed in Benpres Building

Area	Containers/IEC Materials	Quantity	Notes
Each tenant office Communal canteen Elevator	IEC posters containing instructions about proper solid waste disposal	Total 24	One poster per office
Pantries of tenant offices	Plastic containers for leftover food	11	One container per one pantry
Waste paper storage in basement	Segregation bin for paper with four compartments	1	
Outdoor waste bins	Tarpaulin labels for three compartments (recyclables, garden waste, and residuals)	3	

(3) Outcomes

Benpres Building has adopted the following policy for solid waste management, and Benpres Building Administrator has informed the tenant offices of the policy to follow.

- | |
|---|
| <ol style="list-style-type: none"> 1. No littering within and around the Benpres building. 2. Waste materials should be placed on their proper containers. 3. Waste materials should be segregated before disposal. 4. Drink containers (PET Bottles, aluminum cans) should be emptied in sinks before disposal. 5. Paper should not be crumpled. 6. No smoking near the paper boxes or in the storage area. 7. Segregation bins should be secured against vandalism or damage. 8. Personal trashcans are encouraged to contain only residuals. |
|---|

Quality of the recyclables recovered from waste bins after the start of the case study will be evaluated later with the data on volume and value of the recyclables. Recyclable segregation bins and food waste bins in the office pantries have been installed (see pictures below). Waste papers are collected and brought to a junkshop every day; this works as a part of fire prevention. The common storage areas for recyclables have been established (use of the existing waste bin has been activated, and a storage for collected waste paper is newly established).



Recyclable Segregation Bin at Office Pantry



Food Waste Bin at Office Pantry



Poster in Office



Use of Existing Waste Segregation Bin



Collected PET Bottles



Collected Recyclables Weighed by Junkshop

The following table shows the volume and value of recyclables collected in Benpres Building before the case study (one full week in May 2007).

Table 1.4.6 Volume and Value of Recyclables at Benpres Building before the Case Study

Recyclable	Weight (kg)	Unit Price (PhP/kg)	Value (PhP)	Daily Avg. (kg/d)
White paper	84	8.00	672.00	12.00
Newspaper	70	4.00	280.00	10.00
Cartons	58	2.00	116.00	8.29
Assorted paper	7	1.00	7.00	1.00
Shredded white	72	9.00	648.00	10.29
PET	4	15.00	60.00	0.57
HDPE	16	10.00	160.00	2.29
Aluminum cans	1.3	1 peso/pc	72.00	

*Volume is calculated based on a weekly volume.

The following data were gathered in two separate selling periods, each covering seven days of collection. While volumes did not vary significantly from those prior to the start of the case study, it should be noted that the interventions for Benpres were more on improving the quality of the recyclables being received, as well as having a communal storage area for paper and wet recyclables.

Table 1.4.7 Volume and Value of Recyclables Collected at Benpres Building during the Case Study

Recyclable	Weight (kg)	Unit Price (PhP/kg)	Value (PhP)	Daily Ave. (kg/d)
White paper	60.5	8.00	484.00	8.64
Newspaper	40	4.00	160.00	5.71
Cartons	55.5	2.00	111.00	7.93
Assorted paper	34	1.00	34.00	4.86
Shredded white	12	9.00	108.00	1.71
PET	8.5	15.00	127.50	1.21
HDPE	4	10.00	40.00	0.57
Aluminum cans	3.69	1 peso/pc	203.00	0.53

1.5 Recyclables Collection in Commission on Human Rights of the Philippines

1.5.1 Current Conditions and Issues

(1) Site Profile

Commission on Human Rights of the Philippines (hereinafter referred to as CHRP) is a government organization and has its central office in Quezon City. CHRP building is located in Barangay UP Campus, whose land is owned by the University of the Philippines. There is a junkshop within the premises of the University; it has been collecting recyclables before the university was established. The site profile is summarized in Table 1.5.1, and some pictures representing the site are shown below.

Table 1.5.1 Profile of Commission on Human Rights of the Philippines

Location	Bgy. UP Campus, Quezon City
Size	270 employees 1 building, 3 floors, and 24 offices
Management organization	General Services Division is in charge of waste management in the CHRP building.
Reasons for being selected as case study site	<ul style="list-style-type: none"> • The management of CHRP is supportive of the case study. • Location within the same barangay as one of the residential area study sites may give additional insights of dynamics at LGU level.



Overview of the Building



Outdoor Waste Bin



Collected Waste



Recyclables Recovered from Waste



Recyclables in Storage



Recyclables Sorted at Junkshop

(2) Waste Management Practices

Waste management practices in the CHRP as of August 2007 are summarized as follows:

Table 1.5.2 Waste Management in Commission of Human Rights

Recyclables Volume/ Characteristics	<ul style="list-style-type: none"> • Significant amount of waste paper is generated. • Recyclables are mixed with biodegradable or food wastes (no wet vs. dry waste segregation).
Solid Waste Management	<ul style="list-style-type: none"> • There is no waste segregation practice in the office. Because workers have lunch at their desks (there is no canteen in the CHRP building), waste papers in the waste bin are soiled with food waste. • The solid waste management plan has not been prepared yet. • CHRP has a policy on the use of white paper (one-side unused white paper which contains non-confidential information should be collected and converted into memo-pads). • Waste paper collected by janitors is stored in a janitor lounge where fuel oil in a coke bottle is also stored. The janitor lounge does not have enough space for properly storing and processing recyclables. • The junkshop who buys recyclables from the janitors at the CHRP building proposes that if the recyclables are processed, he will buy them at higher price. • Janitors are not so concerned about their health and safety during their collecting recyclables.

1.5.2 Needs Assessment

The needs of CHRP in the field of solid waste management were identified during the focus group discussions as follows:

- a. The General Services Division wants to make their reuse policy for paper to be more effective.
- b. The General Services Division wishes to minimize littering by stray cats by managing their kitchen waste.
- c. Janitors wish the offices would segregate to reduce processing of the solid waste and increase recyclables collection, especially paper that is contaminated with food waste.

1.5.3 Recyclables Collection Plan

(1) Expected Outcomes and Activities

Based on the above needs assessment, expected outcomes and corresponding activities are planned as in the following table.

Table 1.5.3 Expected Outcomes and Activities in Commission on Human Rights

Expected Outcome	Activity
CHRP employees segregate wastes according to the instructions	<ul style="list-style-type: none"> • Develop a policy on solid waste management. • Give the employees and the janitors instructions on waste segregation. • Install segregation frames on each floor and waste paper bins for each office. • Take out individual trashcans from the offices.

Wastes in CHRP will be handled as follows:

Table 1.5.4 Ways to Handle Wastes in CHRP

Type of Solid Waste	Leftover Food	White paper (both sides used)	White paper (with confidential information)	Newspaper	Waste paper (Scratch, Cartons)	Recyclables (PET, Aluminum Cans)	Residuals	Yard waste (leaves and branches)
Intermediate container	Food Receptacles in office then food waste bin in corridor	White paper boxes in office	Shredder in office	Newspaper Boxes in office	Wastepaper Boxes in office	Recyclables Bin in corridor	Residuals Bin in corridor	
Person responsible for placing waste in correct container	Office employees	Office employees	Office employees	Office employees	Office employees (assistance from janitor as needed when transferring contents to wastepaper bin in corridor)			Janitor
Schedule of intermediate collection	Daily; and immediately as needed	Daily	Daily	Daily	Daily	Daily	Daily	Daily
End destination of solid waste	Pet Food Collector (office employees); Composting area for spoiled, inedible and uncollected leftovers	Recyclables storage area	Recyclables storage area	Recyclables storage area	Recyclables storage area (for immediate sorting of recyclables collected)	Recyclables storage area (for immediate sorting of recyclables collected)	Garbage Storage Facility; for eventual collection by EPWMD residuals waste truck	Yard; Composting Area
Person responsible for transfer of waste to end destination	Janitor							
Schedule of end collection	Daily	To be coordinated with junkshop					Monday, Wednesday, Friday	NA

(2) Structure for Implementation

The waste segregation and recycling is implemented by the structure as indicated in Figure 1.5.1. The General Service Division supervises the program. Representatives from each floor (floor leaders) are responsible for the dissemination of information and education regarding the solid waste

management on their corresponding floors. Administrative officer is responsible for the dissemination of information and education regarding the solid waste management within the building to ensure that solid waste segregation and collection measures adopted for offices, restrooms, and yard areas are effectively implemented in coordination with the floor leaders and the maintenance supervisor.

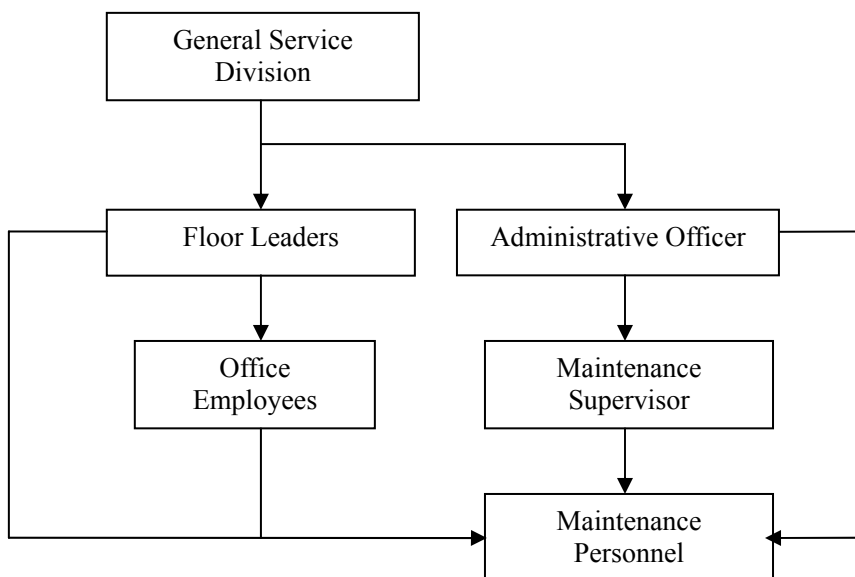


Figure 1.5.1 Structure for Implementation in Commission on Human Rights of the Philippines

1.5.4 Achievement

(1) Implementation Schedule

The above-mentioned activities were implemented as in the schedule below.

Table 1.5.5 Activity Schedule in Commission on Human Rights of the Philippines

Schedule	Activities
5-9 Nov. 2007	<ul style="list-style-type: none"> • Finish Solid Waste Management and Collection Plan proposals, and discuss with key persons for approval.
12-16 Nov. 2007	<ul style="list-style-type: none"> • Design, procurement/preparation and installation of IEC materials and infrastructure. • Presentation of SAGIP Environment and planning for launching of program.
19-23 Nov. 2007	<ul style="list-style-type: none"> • Installation of kitchen waste pails and IEC posters for offices. • Room to room visits. • Training on proper waste segregation. • Implementation of Solid Waste Management and Collection Plan. • Start of monitoring.
26 Nov. 2007 until the end of December 2007	<ul style="list-style-type: none"> • Monitoring. • Documentation.

(2) IEC Materials and Equipment Distributed

The IEC materials and equipment distributed in CHRP are summarized in Table 1.5.6.

Table 1.5.6 IEC Materials and Equipment Distributed in Commission on Human Rights

Area	Container / IEC Material	No. of Units	Notes
Offices	Waste paper box with sign	24	
	Poster identifying different office wastes	24	
Corridors	Waste segregation bin with sign	7 (2 per floor for three floors, and 1 at the extended wing)	Includes food waste, waste paper, recyclables, and residuals containers
	Program poster	1	To serve as reminder for visitors that CHRP practices segregation

(3) Outcomes

CHRP has adopted the following policy on solid waste management.

1. No Littering within and around the CHRP building premises.
2. Waste materials should be placed in their proper containers.
3. Waste materials should be segregated before disposal.
4. Non- confidential white paper should be used on both sides before disposal.
5. Paper should not be crumpled.
6. Drink containers such as mineral water bottles, and aluminum cans should be emptied of its contents before putting in the bins to avoid pests.
7. No smoking near the paper boxes or in the storage area.
8. Segregation bins should be secured against vandalism or damage.
9. Personal trash cans will be removed so that garbage segregation and collection will be centralized at the office level.
10. Employees are encouraged to participate in segregation through IEC and orientation sessions.

By the early December 2007, two waste segregation frames have been installed in the corridor of each floor (see picture “Segregation Frame on the Corridor” below), and individual trash cans have been removed from the offices except one that has lots of visitors. There are only waste paper bins for collecting used white papers within the office space (see picture “Waste Paper Bin” below). Employees have started following the waste segregation rule (see pictures “Segregated Waste in the Frame” below)

 <p>Segregation Frame on the Corridor</p>	 <p>Food Waste</p>  <p>Waste Paper</p> <p>Segregated Waste in the Frame</p>
 <p>Recyclables</p>  <p>Residuals</p> <p>Segregated Waste in the Frame</p>	 <p>Poster on the Wall</p>
 <p>Waste Paper Bin</p>	 <p>PET Bottles</p>  <p>Aluminum cans</p> <p>Sorted Recyclables</p>

The following table shows the volume and value of recyclables collected at CHRP before the case study. These data will be compared with the same kind of data after the case study period to see the impact of the activities under the case study.

Table 1.5.7 Volume and Value of Recyclables Collected at Commission on Human Rights before the Case Study

Recyclable	At Primary Collection (Sold by Collectors to Junkshop)		At Consolidator (Sold by Junkshop to Consolidator)	
	Volume (per month)	Unit Price*	Volume (per month)	Unit Price
White Paper	208 kg	P7.00/kg	1 ton	P7.00/kg
Newspaper/ Colored	42 kg	P4.50/kg		P5.00/kg
Cartons	6.5	3.00/ kg	2 tons	
Assorted paper	26 kg		2 tons	
Plastic PET	3 kg	P17.00/kg		P18 (unprocessed) P22 (processed) P12/ kg (colored PET)
Plastic hard	1.5 kg	P10.00/kg		P10.00/kg
Residual plastics				P0.10/ kg
Aluminum Cans	1.6 kg	P60/kg	10-25 kilos	P60/kg
Tin Cans				
Glass bottles			Small volume	

The following table reflects the total volume of recyclables collected at CHRP and sold by the janitors. This covers two transactions that they were able to record during the case study period; however, the exact length of time this covers was indeterminate. The junkshop they sell to (Ben Almaden's Junkshop) is located within Bgy. UP Campus, is a member of the Linis Ganda network, and has been in operation for at least 10 years.

Table 1.5.8 Volume and Value of Recyclables Collected at Commission on Human Rights during the Case Study

Recyclable	Weight (kg)	Unit Price (PhP/kg)	Value (PhP)
White paper	96	7-8	717.00
Newspaper	109	4.5 - 5.00	499.50
Cartons	20	3.00	60.00
Assorted paper	15	1.00	15.00
PET	28	15-20	452.50
HDPE	1	10.00	10.00
Aluminum cans	4	52.00	208.00

1.6 Recyclable Collection in New Era High School

1.6.1 Current Conditions and Issues

(1) Site Profile

New Era High School (hereinafter referred to as NEHS) is a public school and has about 3,400 students. Due to an increase in students who used to go to private high schools transferred to NEHS (a public school cannot refuse the transferring students), the school facility is not enough to accommodate all the students at one time. The school facility is used on a two-shift system; the first and the third grade students use the classrooms from 6:00 to 12:40, and the second and the fourth grade students from 12:40 to 19:20. The site profile is summarized in Table 1.6.1, and some pictures representing the site are shown below.

Table 1.6.1 Profile of New Era High School

Location	Bgy. New Era, Quezon City
Size	About 3,400 students 5 buildings, 28 class rooms
Management organization	One of the teachers has experiences in preparing a school-wide solid waste management plan (attended one-day seminar organized by Miriam Collage).
Reasons for being selected as case study site	<ul style="list-style-type: none"> • Profile is representative of typical urban public high school. • There was a previous intervention about waste segregation.

(2) Waste Management Practices

Waste management practices in the NEHS as of August 2007 are summarized as follows:

Table 1.6.2 Waste Management Issues in New Era High School

Recyclables Volume/Characteristics	<ul style="list-style-type: none"> • Significant volume of PET bottles, plastic cups, and some papers and cans are generated (students buy and eat snacks during the morning and afternoon recess).
Solid Waste Management	<ul style="list-style-type: none"> • Waste bins are in place around the campus and are already designed for segregation purposes, but the labels for segregation have been taken off due to students' mischief. Therefore, wastes are all mixed in the waste bins. • There are janitors in the school to collect waste from the common areas. Students are in charge of bringing waste in plastic bags in the classrooms to the waste storage area. • Students are told not to bring their snacks including drinks into the classrooms. However, since more than 1,000 students come to the small canteens to buy snacks during the recess (10 min.), students are prone to brake the rule. • Once the waste segregation was practiced for about three months or so when the labels were on the waste bins. After the labels were taken off, students became not practicing waste segregation any more. • Teachers' workload is already heavy; it is difficult to spend extra time for them to educate their students about waste segregation.



Waste Bin



Waste Bin



Discarded Waste (Unsegregated)



Waste Storage for Municipal Collection

1.6.2 Needs Assessment

The needs and concerns of NEHS in the field of solid waste management were identified during the focus group discussions as follows:

- a. Main concern of teachers is littering in the corridors, school grounds and inside the classroom;
- b. Janitor to student / faculty ratio is 1:900; hence, cleanliness and maintenance is a major problem;
- c. Poor segregation at source makes it difficult for janitors to recover recyclables to sell;
- d. Main source of solid waste problem would be waste related to eating and refreshments;
- e. The mixing of biodegradable waste with recyclables and residuals causes very foul odor emitting from their mini-dumpsite within the school premises;
- f. The mini-dumpsite poses a health hazard to the school population and greatly affects the atmosphere conducive to learning; and
- g. Students who clean or pick up trash are teased/ laughed upon.

1.6.3 Recyclables Collection Plan

(1) Expected Outcomes and Activities

Based on the above needs assessment, expected outputs and corresponding activities are planned as in the following table.

Table 1.6.3 Expected Outcomes and Activities in New Era High School

Expected Outcome	Activity
Students are conducting waste segregation according to the instructions	<ul style="list-style-type: none"> • Hold meetings with school administrators and teachers to: (1) establish and coordinate efforts aimed at improving state of waste management, and (2) determine specific plans of action that may be implemented to improve state of waste management at NEHS. • Hold seminars for teachers (class advisers) for effective communication or instruction of waste segregation topics to students. • Hold seminars for canteen personnel for proper wet vs. dry waste segregation. • Provide NEHS with segregation frames and posters. • Each class prepares waste paper bin. • Hold school wide competitions for the cleanest classroom.

Wastes in NEHS will be handled as follows:

Table 1.6.4 Ways to Handle Wastes at New Era High School (Classroom)

Type of Solid Waste	Paper Waste	Food Waste	Liquid Waste	Recyclables	Residuals
Intermediate container	Waste paper bin	Food waste container	Liquid waste container	Recyclables container	Residuals container
Person Responsible for placing waste in correct container	To be ensured and supervised by <u>all</u> teachers.				
Schedule of Intermediate Collection	Daily; and immediately as needed				
End Destination of Solid Waste	Recyclables storage area (for immediate sorting of recyclables collected)	Food waste container (in canteen area), to be eventually collected by food waste collector	Drainage	Recyclables storage area (for immediate sorting of recyclables collected)	Dumpsite area within school grounds, for eventual collection by EPWMD residuals waste truck
Person responsible for transfer of waste to end destination	Utility personnel assigned to classroom area.				
Schedule of End Collection	Coordinated with barangay junkshop	Daily collection by canteen staff	As needed	Coordinated with barangay junkshop	As scheduled by EPWMD

(2) Structure for Implementation

The recyclables segregation/collection is implemented by the following entities.

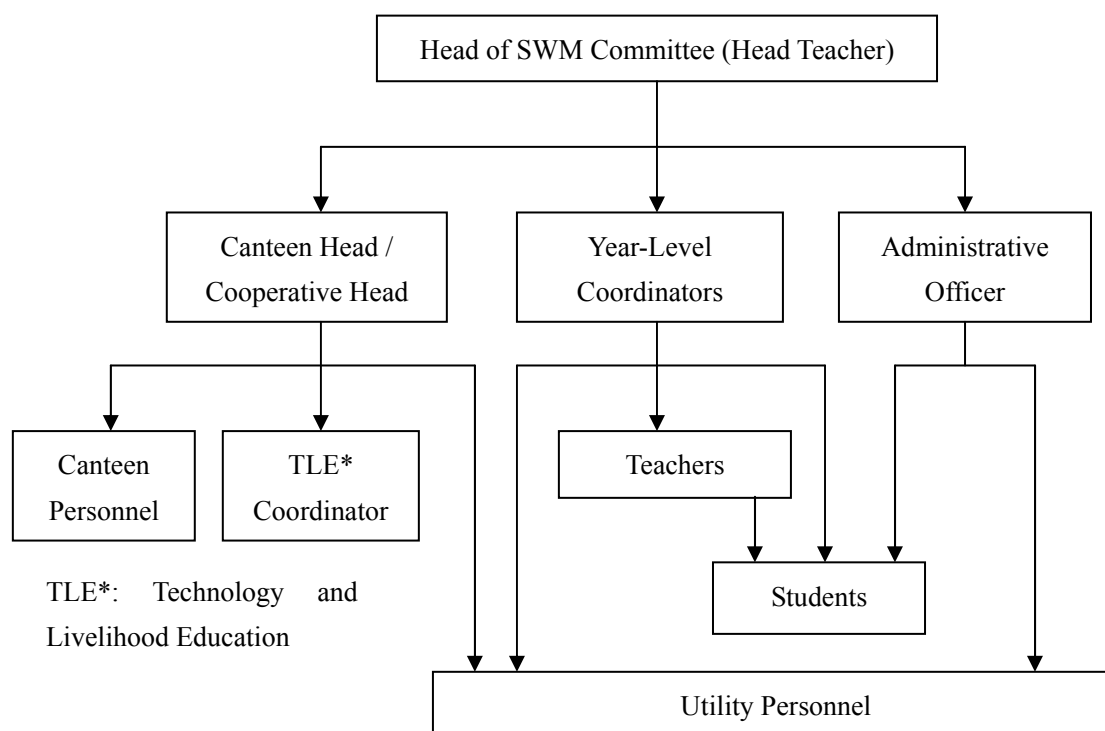


Figure 1.6.1 Structure for Implementation in New Era High School

1.6.4 Achievement

(1) Implementation Schedule

The above-mentioned activities were implemented by the following schedule.

Table 1.6.5 Activity Schedule in New Era High School

Schedule	Activities
23-29 Sep.2007	<ul style="list-style-type: none"> Finish Solid Waste Management and Collection Plan, and discuss with key persons for their approval.
30 Sep.- 3 Nov. 2007	<ul style="list-style-type: none"> Design, procurement, and preparation, of IEC materials and infrastructure.
4-10 Nov. 2007	<ul style="list-style-type: none"> Training of canteen and utility personnel regarding proper waste segregation; Grand meeting with key personnel (especially teachers) regarding implementation of Solid Waste Management and Collection Plan.
11-17 Nov. 2007	<ul style="list-style-type: none"> Implementation of Solid Waste Management and Collection Plan in NEHS. Installation of segregation bins and waste paper boxes. Room to room campaigns. Start of monitoring..
18-24 Nov. 2007 onwards until the end of December	<ul style="list-style-type: none"> Monitoring; Documentation.

(2) IEC Materials and Equipment Distributed

The IEC materials and equipment distributed are summarized in Table 1.6.6. Each class was asked to prepare one waste paper bin by wrapping a corrugated cardboard box with color paper so that students can distinguish them from a regular waste box.

Table 1.6.6 IEC Materials and Equipment Distributed in New Era High School

Area	Container / IEC Material	No. of Units	Notes
Canteen	Compostables Container	1	Inside kitchen
	Segregation Frame with sign	1	Dining area, includes bins for food waste, recyclables, liquid waste, and residuals
School Buildings and Classrooms	Waste Paper Bin	56 (2 per classroom)	Two classes are assigned to use a room. Each class was asked to prepare a waste paper bin.
	Segregation Frame with sign	9 (average of 2-3 per building)	Includes bins for food waste, recyclables, liquid waste, and residuals
School Grounds	Segregation Frame with sign	3 (2 for the canteen and one near the SSG office)	Includes bins for food waste, recyclables, liquid waste, and residuals
	Tarpaulin visually illustrating solid waste collection plan and detailing categories of waste	2	Posted on the school building wall near the gate
Administration Building	Program Poster detailing the objectives of the study	1	Posted in the administration building

(3) Outcomes

Segregation frames have been installed in the canteen and each floor of the school buildings, and the students have started segregating waste to food waste, liquid waste (leftover drinks), recyclables (plastics and cans) and residuals (see the picture “Segregation Frame at Canteen” below). A large poster to explain waste types and proper segregation practices has been put on the wall of the school building near the school gate so that all the students can see it (see the picture “Poster on Explanation of Waste Type”). In addition, there is a poster on recyclables collection campaign to inform students of the activities in the case study as school wide activities (see the picture “Poster on Recyclables Collection Campaign” below). Although there are some classes that have not prepared a waste paper bin, most of the classes have prepared and started waste paper segregation (see the picture “Waste Paper Bin” below).

NEHS has integrated recyclables collection as a school activity, and started to hold cleanest classroom competitions. According to the teacher in charge of coordinating the recyclables collection, there used to be a pile of waste in the classrooms, but the environment has been much improved since the recyclables collection campaign.



Poster on Explanation of Waste Type



Poster on Recyclables Collection Campaign



Segregation Frame at Canteen



Food Waste



Funnel for Liquid Waste

Segregated Waste in the Frame



Recyclables



Residuals

Segregated Waste in the Frame



Jar for Storing Liquid Waste (Segregation Frame)



Waste Paper Bin (for AM/PM classes)

Collected Waste Paper

The following table shows the volume and price of recyclables collected at NEHS before the case study.

Table 1.6.7 Volume and Value of Recyclables Collected at New Era High School before the Case Study

Recyclable	At Primary Collector (sold by collector to junkshop)	
	Volume*(per month)	Unit Price**
White Paper	(wet) 49 kg	Wet: P1/kg Dry: P7/kg
Cartons	25 kg	P4/kg
Plastic PET	Bottles only, cleaned and stripped of labels – 33 kg	P23/kg
Other Plastics	Plastic cups + mineral bottle caps – 34 kg	Plastic cups + mineral bottle caps: P20/kg

*Amounts only reflect 2 weeks' worth of collection.

** Price/kg indicated are as set by direct junkshop buyer; no middle-man involved.

The table below shows the volumes and values of the recyclables sold by one of the janitors after a three-week period. This does not reflect, however, the total recyclables that were actually recovered, since the other janitor who also collects these recyclables has not yet sold her share. There are also reports of teachers who are now beginning to sell the paper collected from the classrooms although no monitoring data of this was obtained.

Table 1.6.8 Volume and Value of Recyclables Collected at New Era High School during the Case Study

Recyclable	Weight (kg)	Unit Price (PhP/kg)	Value (PhP)	Daily Avg. (kg/d)
White paper	14	10.00	140.00	0.67
Cartons	20	5.50	110.00	0.95
PET	8	24.00	192.00	0.38
HDPE	83	20.00	1,660.00	3.95
Spoon & fork	26	10.00	260.00	1.24
Tin cans	14	5.50	77.00	0.67

During the Waste Analysis and Characterization Survey (WACS) conducted by the QC EPWMD for this site under the case study baseline data gathering, it was discovered that over a one-week period, the school generates about 24 kg of paper, 26 kg of plastic, and nearly 2 kg of tin cans. The rates calculated under the recorded selling are still less than the potential rates as determined in the previous WACS. Still, there have been improvements observed – littering has noticeably reduced in the corridors and the classrooms. One classroom that used to have a small garbage pile in the back corner was given the “Most Improved Classroom” citation since it started practicing segregation after the project implementation.

Recent visits after the Christmas vacation, however, revealed that some students have reverted back to their old habits of littering and not segregating. Constant reiteration therefore is crucial in a school set-up, since every year there are new students coming in, and school breaks take away some of the momentum established by cleanliness campaigns.

1.7 Recyclables Collection in SM Sta. Mesa Food Court

1.7.1 Current Conditions and Issues

(1) Site profile

The food court is located on the basement of the SM Sta. Mesa shopping center and has 19 tenants that prepare and serve food and drinks in their kitchen and 23 food stalls that only sell prepared foods such as bread and cookies. Customers can buy their food and drinks at any of the tenants/food stalls and eat at tables in the food court. After eating, customers can throw their wastes and leftover food and drinks into trash bins or leave them on the table. The staffs called busboys collect and segregate used plates, cups, cans, and silverwares from the tables. The reusable plates and silverwares are washed in the backyard of the food court, and plastic cups and aluminum cans are segregated for collection. The site profile is summarized in Table 1.7.1, and some pictures representing the site are shown below.

Table 1.7.1 Profile of SM Sta. Mesa Food Court

Location	Quezon City (straddles the border of QC, Manila and San Juan)
Size	Covers most of the basement 19 tenants (with kitchen), 23 food stalls (without kitchen)
Management organization	Food court management is in charge of solid waste management in the food court.
Reasons for being selected as case study site	<ul style="list-style-type: none"> • Some levels of segregation of recyclables are practiced. • Replicable to the food courts in other SM shopping center.



Recyclables Collected by Busboys
(Dishwashing Area)



Waste Storage Area



Signage at Waste Storage Area



Collected Food Waste and Plastic Bottles



Signage at Waste Storage Area



Collected Cardboard

(2) Waste Management Practices

Waste management practices in the SM Sta. Mesa Food Court are summarized as follows:

Table 1.7.2 Waste Management in SM Sta. Mesa Food Court

Recyclables Volume/Characteristics	<ul style="list-style-type: none"> • Significant volumes of PET, plastic cups, and aluminum cans are generated. • Segregation of recyclables (plastic cups, PET bottles, and aluminum cans) from tables in the food court is practiced.
Solid Waste Management	<ul style="list-style-type: none"> • Inadequate or inconsistent orientation/training of maintenance employees with regards to wet vs. dry waste collection policy as enforced on tenants. • Tenants may not be fully aware of importance of proper segregation of waste materials generated from their kitchen operations although there are policies on wet vs. dry waste segregation. • Identified types of materials segregated by busboys can still be expanded to maximize recyclables collected in their efficient operations already in place.

1.7.2 Needs Assessment

The needs and concerns of SM Sta. Mesa Food Court were identified during the focus group discussions as follows.

- a. Food court tenants sometimes do not abide by mall policies of segregation.
- b. Buyer of recyclables only gets aluminum cans, cups and PET bottles, but not other types of recyclables.
- c. Limited storage space for additional types of recyclables such as plastic straws since it is not bought daily.
- d. From SM upper management, they want to see how this could be replicated in other Food Courts.

1.7.3 Recyclables Collection Plan

(1) Expected Outcomes and Activities

Based on the above needs and concerns assessment, expected outcomes and corresponding activities are planned as in the following table.

Table 1.7.3 Expected Outputs and Activities in SM St. Mesa Food Court

Expected Output	Activity
Recyclables are collected from tables and sold to junkshops in an efficient manner	<ul style="list-style-type: none"> • Conduct discussions involving concerned mall administrators and hauler to determine: (1) what other types of recyclables may be accepted aside from the ones already being collected; (2) steps that may be taken by administrators to increase value of recyclables being collected. • Develop standard orientation/training program for maintenance staff and busboys regarding proper enforcement of wet vs. dry waste segregation policies.

Expected Output	Activity
	<ul style="list-style-type: none"> • Conduct training on the proper enforcement of waste segregation policies. • Find buyers of used plastic straws.
Tenants practice proper waste segregation	<ul style="list-style-type: none"> • Prepare and put on posters reminding of proper wet vs. dry segregation to be placed in conspicuous spots in common areas. • Prepare and disseminate a booklet containing proper classification of wet vs. dry waste materials, and proper segregation methods for these.

Wastes in SM St. Mesa Food Court will be handled as follows:

Table 1.7.4 Ways to Handle Wastes at SM Sta. Mesa Food Court by Waste Type

Type of Solid Waste	Food Waste	Recyclables (plastic cups, PET bottles, tin cans, straws)	Residuals
Intermediate Container	Busboy Carts		
Person Responsible for placing waste in correct container	Busboy personnel		
Schedule of Intermediate Collection	Daily; and immediately as needed		
End Destination of Solid Waste	Food waste collector	Recyclables collection and segregation area; and junkshop/recycler buyers	Residuals bin for eventual collection by EPWMD residuals waste truck
Person Responsible for Transfer of Waste to End Destination	To be coordinated by Operations Supervisor	To be coordinated by Operations Supervisor and Food Court Manager	To be coordinated by Operations Supervisor and Food Court Manager
Schedule of End Collection	To be coordinated with contact food waste collector	To be coordinated with buyers	As scheduled by EPWMD

(2) Structure for implementation

The recyclables segregation/collection is implemented by the following entities.

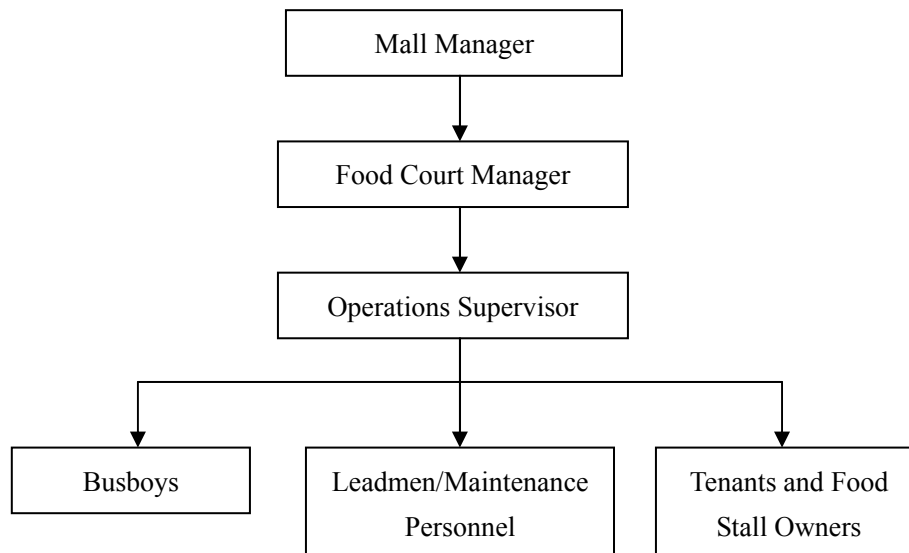


Figure 1.7.1 Structure for Implementation at SM Sta. Mesa Food Court

1.7.4 Achievement

(1) Implementation Schedule

The above-mentioned activities were implemented as in the schedule below.

Table 1.7.5 Activity Schedule in SM Sta. Mesa Food Court

Schedule	Activities
5-9 Nov. 2007	<ul style="list-style-type: none"> Finish Solid Waste Management and Collection Plan proposals, and discuss with key persons for approval.
12-16 Nov. 2007	<ul style="list-style-type: none"> Design, preparation, procurement and installation of IEC materials and infrastructure. Presentation of SAGIP Environment to SM Sta. Mesa Mall management and SM Supermalls upper management. Planning for launching of program.
19-23 Nov. 2007	<ul style="list-style-type: none"> Revisions of IEC materials incorporating SM management comments.
26 Nov. – 07 December 2007	<ul style="list-style-type: none"> Deployment of IEC materials for stalls. Deployment of SM food court banner.
Dec. 8 2007	<ul style="list-style-type: none"> Second selling of recyclables during Waste Market. Deployment of prototype push cart IEC material.
Jan. 15, 2008	<ul style="list-style-type: none"> Deployment of final version of push cart IEC material.

(2) IEC Materials and Equipment Distributed in SM Sta. Mesa Food Court

The IEC materials and equipment distributed are summarized in Table 1.7.6.

Table 1.7.6 IEC Materials and Equipment Distributed in SM Sta. Mesa Food Court

Infrastructure Materials	Specifications	Quantity
IEC Posters on pushcart front	Contains information on the busboy pushcart as a segregation module	15
Stall posters	Small poster reminding tenants to segregate wet vs. dry waste	30
Tarpaulin	On recyclables collection project and SM Supermalls'	1

(3) Outcomes

After the training of busboys on waste segregation and collection, they started collecting used plastic straws as an additional recyclable (see the picture “Used Straws and Cup Caps Additionally Collected by Busboys” below). Although the existing waste hauler does buy used plastic straws, the Food Court has found a buyer of the straws at the monthly held Waste Market at SM Sta. Mesa shopping center.

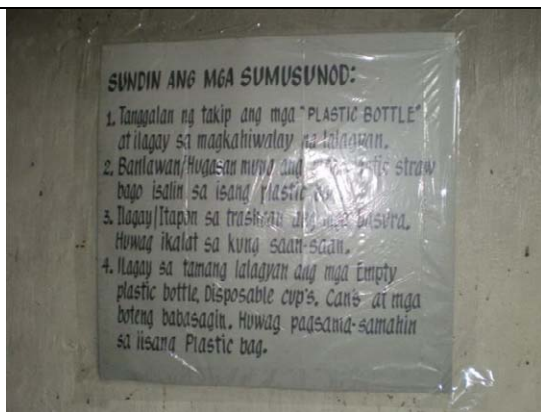
A sign to inform customers in the food court how the collected wastes are recycled is attached to a pushcart that the busboy uses for waste collection, which is expected to increase awareness of the general public towards recycling (see the picture “Sign for Awareness Raising of the Customers for Waste Segregation and Recycling” below).



Used Straws and Cup Caps Additionally Collected by Busboys



Waste Plastics Collected from the Food Court and Sold to Junkshop



Poster on Waste Segregation Policy



Poster on Proper Waste Segregation



Sign for Awareness Raising of the Customers for Waste Segregation and Recycling



Plastic Bottle Caps Collected from Tables

The following table shows the volume and price of recyclables collected at SM Sta. Mesa Food Court before the case study. These data will be compared with the same kind of data after the case study period to see the impact of the activities under the case study.

Table 1.7.7 Volume and Value of Recyclable Collected at SM Sta. Mesa Food Court before the Case Study

Month	Plastic Cups		Plastic Bottles		Cans	
	Quantity (kg)	Peso equivalent	Quantity (kg)	Peso equivalent	Quantity (kg)	Peso equivalent
May 2007	721	7,210	279	5,580	35	1,750
June 2007	773	7,730	352	7,040	43	2,150
July 1-15, 2007	418	4,180	192	3,840	24	1,200

SM Sta. Mesa Food Court was able to sell other types of recyclables, aside from those being collected daily by Bagayawa (PET bottles, aluminum cans and plastic cups), in two Waste Markets. These events are being held in SM and Ayala malls for more than a year, wherein the public could bring their recyclables and E-waste to the malls and sell them to recyclers and consolidators. During the two Waste Markets held in SM Sta. Mesa on Oct. 27 and Dec. 8, the Food Court was able to sell various types of recyclables, listed in the Table below.

The volumes listed here reflect 66 days of collection, except for the PET, aluminum cans, and plastic cups, which are regularly sold to Bagayawa. During the days leading to the Waste Markets however, the Food Court stores these three recyclables over a few days and opts to sell these during the Waste Markets. The volumes of PET, aluminum cans and plastic cups reflect six days of collection. Plastics and aluminum cans are sold to Polytrader Plastic Products, with recycling facility in Valenzuela, while the rest were sold to EJM Junkshop, operating under the QC Multi-purpose Cooperative.

Table 1.7.8 Volume and Value of Recyclable Collected at SM Sta. Mesa Food Court during the Case Study

Recyclable	Weight (kg)	Unit Price (PhP/kg)	Value (PhP)	Daily Avg. (kg/d)
Newspaper	60	5.50	330.00	0.91
Cartons	13	4.50	58.50	0.20
PET	61.5	18.00	1,107.00	10.25
HDPE	188.5	12.00	2,262.00	long storage
Plastic Straws	160.5	5.00	802.50	2.43
Plastic cups	161	10.00	1,610.00	26.83
Assorted plastics	9	5.00	45.00	0.14
Aluminum cans	15	55.00	825.00	2.50
Metal scraps	26	11.00	286.00	long storage
Fender/ mudguard	18	10.00	180.00	
Bottles (lump) - assorted pcs	826	0.50	482.20	12.52
Shards	39	0.50	19.50	0.59

The following tables summarize the total amount and value of collected recyclables after the case study interventions in all the case study sites.

Table 1.7.9 Total Amount of Collected Recyclables after Interventions

Study Site	Study Phase	Period Covered	Selling Frequency	Amount of Collected Recyclables				
				Paper (kg)	Plastic (kg)	Metal (kg)	Subtotals (kg)	Glass # bottles
GK	Before	no monitored selling						
	After	4 months	3	34.25	22.05	11.00	67.30	173
Libis MRF	Before	recyclables turned over to other barangay MRF for selling with profit sharing						
	After	4 months	4	1,338.00	272.00	467.50	2,238.50	342
CHRP	Before	4 months	1	282.50	4.50	1.60	288.60	0
	After	2 months	2	240.00	29.00	4.00	273.00	0
Benpres	Before	7 days	1	291.00	20.00	1.30	312.30	0
	After	7 days	1	196.00	1.50	1.18	198.68	0
	After	7 days	1	190.00	12.50	3.69	206.19	0
NEHS	Before	no monitored selling						
	After	3 weeks	1	34.00	117.00	14.00	165.00	0
SM Sta. Mesa	Before	regular selling of PET, Aluminum cans, Plastic Cups only						
	After	3 months	2	73.00	358.00	44.00	475.00	828
Subtotals per Material after Interventions				2,105.25	812.05	545.37	3,462.67	1,343

Table 1.7.10 Total Value of Collected Recyclables after Interventions (PhP)

Study Site	Study Phase	Period Covered	Selling Frequency	Value of Collected Recyclables (PhP)				
				Paper	Plastic	Metal	Glass	Subtotals
GK	Before	no monitored selling						
	After	4 months	3	113.75	386.80	42.00	164.34	706.89
Libis MRF	Before	recyclables turned over to other barangay MRF for selling with profit sharing						
	After	4 months	4	3,490.50	3,860.50	2,587.50	222.90	10,161.40
CHRP	Before	4 months	1	1,690.50	66.00	96.00		1,852.50
	After	2 months	2	1,291.50	462.50	208.00	0.00	1,962.00
Benpres	Before	7 days	1	1,075.00	220.00	72.00		1,367.00
	After	7 days	1	1,001.00	20.00	65.00	0.00	1,086.00
	After	7 days	1	789.00	167.50	203.00	0.00	1,159.50
NEHS	Before	no monitored selling						
	After	3 weeks	1	250.00	2,112.00	77.00	0.00	2,439.00
SM Sta. Mesa	Before	regular selling of PET, Aluminum cans, Plastic Cups only						
	After	3 months	2	388.50	5,826.50	1,291.00	501.70	8,007.70
Subtotals per Material after Interventions				7,324.25	12,835.80	3,182.50	888.94	18,875.99