7. Conclusions and Recommendations

7.1 Conclusions

(1) "Polluter-pays principle" is a fundamental rule in solid waste management.

Because there is no available land for disposal site within the Metro Manila area, the construction of a new landfill site is proposed in an area within Bgy. Montalban of Rizal Province.

(2) Garbage crisis

The implementation of the project will save Metro Manila from a garbage crisis.

(3) International SWM Standards

The former final disposal site was poorly constructed, operated, and managed thereby causing several environmental problems. Consequently, people living in the surrounding area of the disposal site opposed the landfill operation, which led to the closure of the Carmona SLF in March 1998.

Therefore, the design, construction and operation should be in conformity with international SWM standards to prevent such problems from recurring. Now, the MMDA has to recover the peoples' trust as public cooperation and acceptance IS indispensable to SWM.

7.2 Recommendations

(1) Implementation of the Master Plan

This project was given first priority among the projects proposed in the master plan and aims to secure a disposal site for SWM in Metro Manila. To avoid a garbage crisis, however, the development of the new landfill site is urgently required at the moment. Therefore, sanitary education programs, recycling activities for waste minimization, improvement of waste collection services in inaccessible areas, improvement of the haulage system, and the introduction of intermediate treatment methods, etc., proposed in the master plan should be implemented to preserve the urban environment.

(2) Improvement of SWM Technology

The present facilities and operation of the final disposal are not appropriate. MMDA should improve its landfill managerial capabilities by the opening of the new SLF. It is recommended that the MMDA staff should undergo training on sanitary landfill operation and management, in the form of on-the-job-training during the actual operation of the present San Mateo SLF, and under the technical guidance of a developed country.

(3) Pilot Plant for Utilization of Landfill Gas and Composting

The volume of waste disposed in the landfill site further increases. Since waste disposed of in the landfill site does not undergo treatment prior to disposal, the decomposition of organic matter in the waste heap is expected to generate a lot of gas. Utilization of the landfill gas is generally unfeasible because of the many impurities it contains and the exorbitant refining cost it requires. Yet considering that the electricity generated by using landfill gas is enough to cover the demand for landfill operation, examining the effectiveness of landfill gas utilization is recommended for the present San Mateo SLF site. If the pilot project is successful, power generation by landfill gas utilization will be included for the new landfill site development

On the other hand, feasibility of composting should be also verified. Because many trees are comparatively few in the MEFCON area, erosion is rampant. Accordingly, soil improvement and tree planting using the compost produced from income waste are recommended.

For the effective use of available resources, landfill gas utilization and organic waste should be considered.

(4) Improvement of Institutional System

(5) Financial Sources

C. PILOT PROJECTS

C1 Improvement of Collection System

C2 Community-based Recycling and Public Relations

C3 Environmental Education

C1: Collection System

1. Improvement of Collection System

1.1 Background

One of the components of the Solid Waste Management Master Plan Study for Metro Manila that commenced in February 1997 was the conduct of a waste stream survey. Figure 1.1 shows the result of the survey, and indicates that of the total generated waste amounting to 5,350 tons per day, 4% is recycled and 6% is disposed of by the residents themselves. Seventy-three percent (73%) of the remaining 90% (4,800 tons) is collected, while the rest is illegally disposed of at open spaces, rivers, esteros, canals and other waterways. It is this uncollected 27% of discharged waste that brings about urban environmental problems, including poor sanitation in the living environment.

The non-collection of a significant portion of the generated waste puts forward the issue of unequal delivery of waste collection services. Obviously, there are sectors of society that are further marginalized by the non-collection of their waste. These sectors are generally found in highly congested and inaccessible areas.

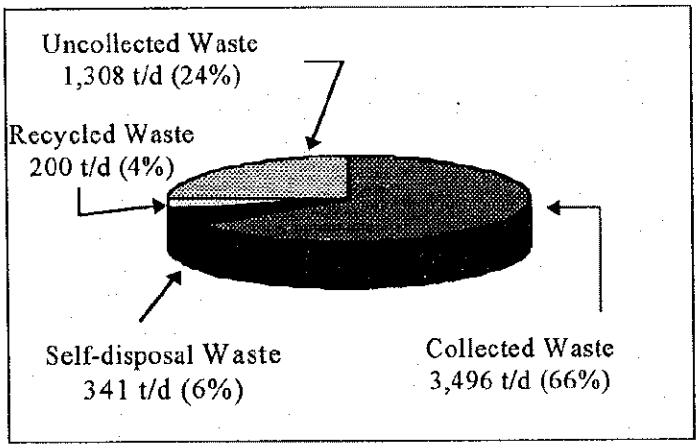


Figure. 1.1 Rate of Generated Waste in Metro Manila

1.2 Objectives

The main objective of the pilot study is to determine the method of collection that is appropriate for the target areas and come up with a mechanism for its operational sustainability. The result of the project is expected to provide a guideline and/or model in improving the collection system in similar areas in Metro Manila thereby keeping up with the Master Plan targets of 80% collection in 2005 and 90% in 2010.

There are benefits from an improved collection system, as follows:

(1) Removal of breeding grounds of disease-carrying insects, e.g. flies, cockroaches, mosquitos, thus ensure better health for residents particularly the sensitive age groups: children and old people;

(2) Formulation of incentives to improve residents' concept of sanitation; and
(3) Sharing of LGUs' financial resources as a result of service area expansion.

1.3 Implementation Policy

As mentioned above, the target of the pilot project is to increase the waste collection rate in Metro Manila by extending collection service to inaccessible areas. Hence this pilot project will mainly verify the concerns below, the results of which will be reflected in the plan.

(1) Establishment of the appropriate discharge, collection and storage system based on the area condition;
(2) Establishment of a combined system of regular collection service as provided by local government/private contractor and primary collection as provided by residents in the area;
(3) Identification of the organizational body responsible in the implementation of the project including management of primary collectors, provision of equipment such as pushcart and communal collection bay; and
(4) Waste collection service fee for primary collectors.

1.4 Implementation Procedure of Pilot Project

Figure 1.2 shows the outline for the implementation of the pilot project. The procedural items and relevant roles of the organizations involved are shown in Table 1.1. The pilot project is essentially divided into four stages; namely, (1) preparation and planning stage, (2) implementation and verification stage, (3) modification and systematize stage, and (4) extension stage.

(1) Preparation and Planning Stage

Three pilot project sites, which are inaccessible to ordinary collection vehicles, were selected based on the scale of population and area, and willingness of LGU and barangay to participate.

A focused group discussion was conducted in each of the sites in order to apply a bottom-up approach in community-based planning. The discussion included participants' profile, concerns and issues, options/alternatives, visioning and stakeholders' analysis.

The action plan for each project site was finalized based on the result of the group discussion, individual meetings and agreements among residents, barangay officials, LGU, the contractor who provides collection service, MMDA and JICA.

(2) Implementation and Verification Stage

The pilot project commenced with an area clean-up activity which was held to create an atmosphere of cooperation, and thus serve as incentive and motivation for the community to maintain cleanliness in the area.

During implementation stage, monitoring and inspection are conducted to make clear the problems and improvement points. A public opinion survey (POS) and time & motion survey (T&M) for collection vehicle and pushcart were conducted to compare efficiency before and during the pilot project.

(3) Modification and Systematize Stage

During the implementation stage, monitoring and inspection are conducted to make clear the problems and improvement points. According to the result of monitoring and evaluation, countermeasures shall be taken to further modify the system. All of the procedures and plans used in the pilot project are systematized, documented and compiled as a reference manual.

(4) Extension Stage

With the manual as reference, the responsible sector and/or persons in charge of the project in the LGUs would be able to extend the collection improvement system to include other inaccessible areas, with support from MMDA.

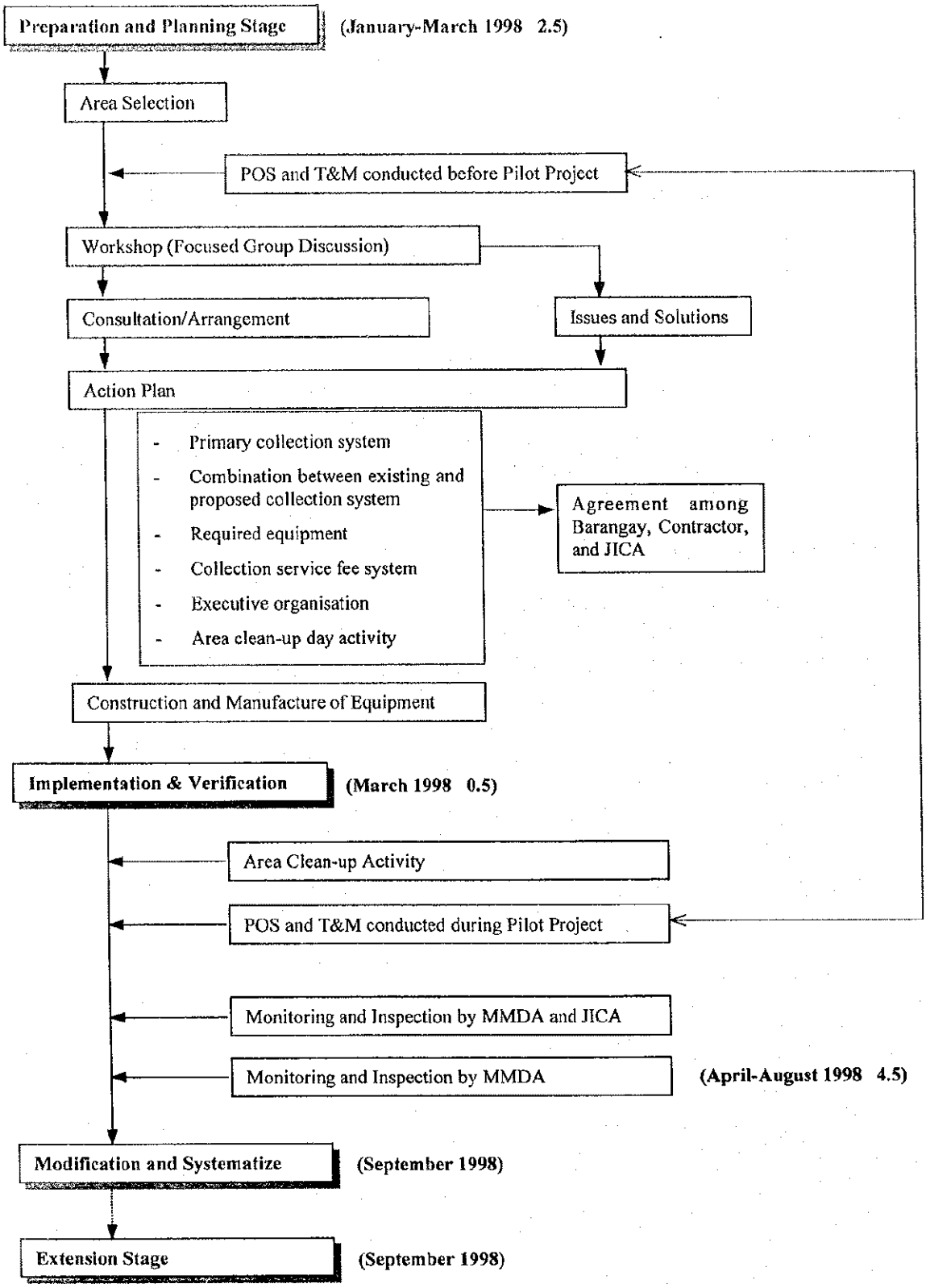


Figure 1.2 Implementation Procedure of Pilot Project

Table 1.1 Implementation Items and Relevant Roles

Preparation & Planning Stage

	Residents	Barangay, Community	LGUs	Contractor	MMDA	Study Team
1. Formulation of pilot project outline					○	●
2. Selection of candidate sites for project			●		○	○
3. Field survey, questionnaire and time & motion survey in candidate sites			○		○	●
4. Meeting with area representatives	○	○	●		○	○
5. Workshop (Focused Group Discussion)	○	○	○	○	●	○
6. Draft action plan			○		●	●
7. Consultation and arrangement	○	○	○		●	●
8. Action plan			○		●	●
9. Determination of target sites (Agreement)			●		○	○
10. Preparation of equipment for pilot project					○	●

● : Main implementing organization ○ : Participatory

Implementation & Verification Stage

	Residents	Barangay, Community	LGUs	Contractor	MMDA	Study Team
1. Opening ceremony	○	○	●	○	○	○
2. Clean-up Day Activity	●	●	●	○	●	○
3. Commencement of collection service	●	●	●	●		
4. Monitoring survey					●	●
5. Questionnaire survey during pilot project						●
6. Time and motion survey during pilot project						●

● : Main implementing organization ○ : Participatory

1.5 Selection Process of Project Sites

(1) Selection Process

In order to choose three pilot sites, a selection process was undertaken. Basically, LGUs with a collection rate lower than 65% (generation amount basis) which were not chosen as pilot areas for community recycling were requested to nominate two sites. The criteria included the following:

(a) Accessibility: The site is not accessible to the collection services/facilities of the LGU.
(b) Size of the Community: The community must consist of a reasonable number of households, possibly not more than 1,000 households.
(c) Community Organization: Existence of a community organization that is willing to cooperate with the study team and provide the necessary liaison to organize and implement the activities that shall subsequently be undertaken.
(d) Support from the LGU: The LGU must be willing to continue with the effort after the study shall have been completed.

Below is a list of the six LGUs as candidate city/municipality for the pilot project.

LGU	*Collection Rate*
Caloocan	37 %
Navotas	40 %
Marikina	51 %
Taguig	57 %
Manila	63 %
Malabon	63 %

Source: JICA study in 1997

Filled up nomination forms for participation of pilot project proposed by LGUs were evaluated and the sites were thereafter inspected and the local authorities interviewed. From among the five nominated sites, three were selected. They are as follows:

(1) Malabon-Bgy. Bayan-bayanan;
(2) Manila City-Bgy. 182,Zone 16;
(3) Quezon City-Kalayaan B and C.

Although the collection rate in , Kalayaan B and C is higher than 65%, it was selected as one of pilot project sites because of the following reasons:

(a) Inaccessible areas are predominant in the jurisdiction, and
(b) LGU and barangay officials expressed earnest willingness to participate in the project because of the area's great need.

(2) Profile of the Sites

A short description of the project sites is given in Table 1.2. while Figure 1.3 pinpoints the areas as well as those with low waste collection rates.

Table 1.2 Profile of the Project Sites

	Bgy.182 in Manila	Kalayaan in Quezon	Bayan-bayanan in Malabon
Population (No. of households)	10,000 (1,000)	12,000 (2,000)	10,000 (1,000)
Area (ha.)	3.0	15 (only Kalayaan B&C)	8.49
Area Condition	The area is a low income residential settlement and highly congested; building structures vary from single to row houses; street are paved and sides of the esteros are newly paved with 3 meters wide concrete roads; a lot of waste is thrown in the esteros.	Depressed community, with dwelling units built close to each other in clusters; a lot of open spaces; almost all streets are narrow and unpaved except for main street. There is a creek 6-10 ft. lower than the main street; portion of creek beside houses is filled with garbage	All inner streets are inaccessible; most of the dwelling structures closest to the major thoroughfare are single detached; along alley, houses can be reached through plank bridges; there is no space to install collection facilities.
Garbage Collection	Main concern is the irregularity of collection; no fixed day and no fixed time; daily collection is provided in the area, but for individual household collection; frequency of collection is once a week. Also, obstruction on streets such as parked cars prevent efficient collection service.	Irregular collection in the barangay by 2 units of mini dump-trucks; no coordination of collection service between barangay / private contractor; collection points are too far; no bins/ receptacles along the street for garbage disposal.	Many households dump garbage under their homes resulting in murky waste; only 1 pushcart collector assigned; collection vehicle passes but outside of the area.

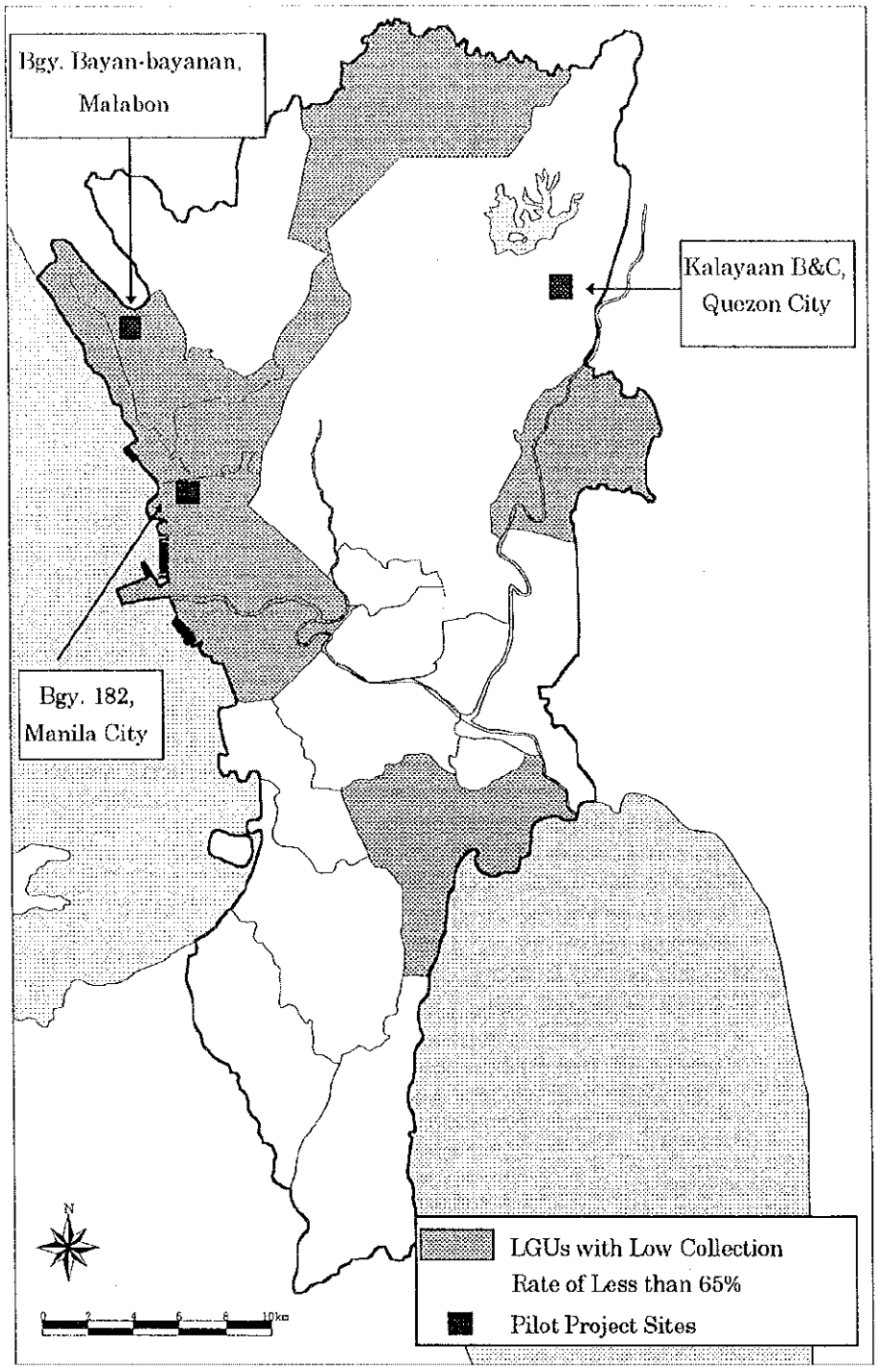
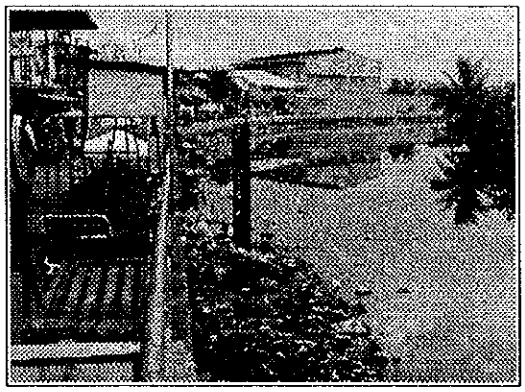
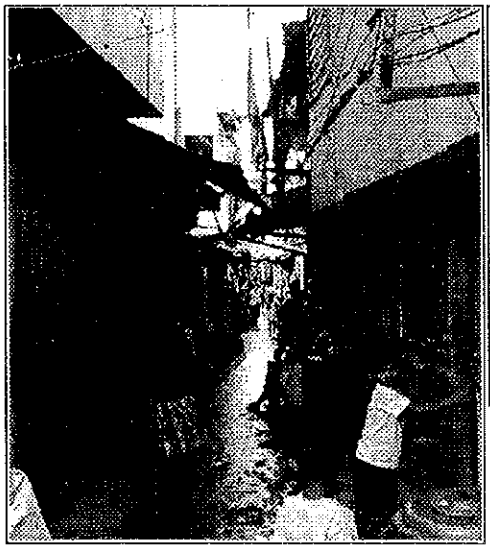


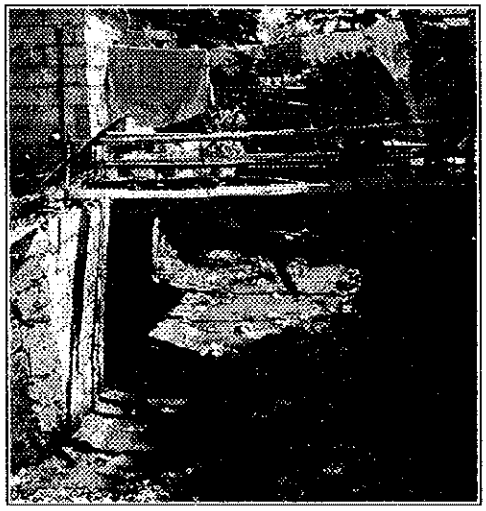
Figure 1.3 Distribution of LGUs with Low Collection Rate and Selected Pilot Project Sites

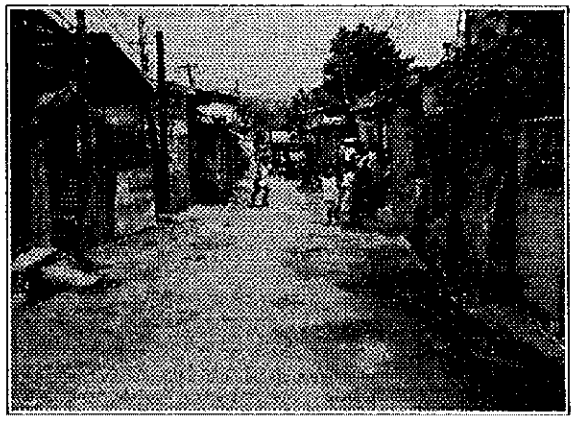


Barangay 182, Manila City



Barangay Bayan-bayanan,
Malabon Municipality





Kalayaan B, Bgy. Batasan Hills,
Quezon City

1.6 Workshop (Focused Group Discussion)

Using the local language, a focused group discussion (FGD) was conducted in each of the pilot sites. The results are shown in Table 1.3.

A focused group discussion is a workshop method that adequately applies a bottom-up approach in community-based planning in contrast with the top-down or prescriptive approach. The method provides a forum wherein each of the participant (without exception) expresses his own perception or concern with the use of color coded cards posted on the board beside his name. The method allows free expression but discourages grandstanding or monopoly of discussion time by some participants. Through the dynamics of the workshop, the participants come to realize ownership of an action plan.

A focused group discussion has the following components and features.

(1) Participants' Profile

This includes address, sex and livelihood. The address shows the geographical spread of the participants while the livelihood and sex partially describes the profile of the participants.

(2) Concerns and Issues

Depending on the objectives of the workshop, concerns and issues are expressed as specific as possible.

(3) Options/Alternatives

The solutions of issues raised are expressed as options or alternatives.

(4) Visioning

This process involves the grouping of the participants into manageable sizes. Based on the issues raised and solutions suggested, the groups are asked to draw their answer to the question "how would you like to see your community in the future (or 5 years hence)?"

(5) Stakeholders' Analysis

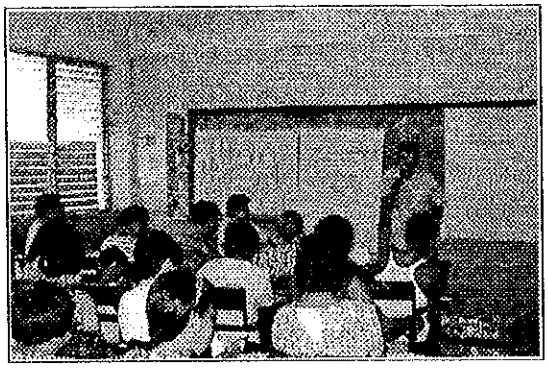
To achieve their vision, accomplish their mission and do the tasks on hand, the participants should be able to identify "who should do what?" Colored paper cut in big and small circles are used. Bright colors and big circles signify bigger roles. Along the roles, rules are likewise mentioned.

At the end of the workshop, the participants are informed that the integration of the results of the discussion forms the basis for an action plan.

Table 1.3 Summary of Focused Group Discussion

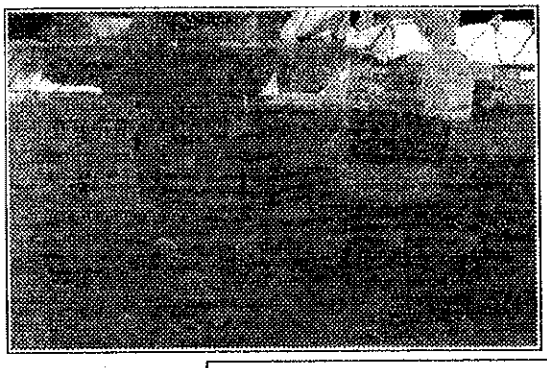
Pilot Area	Bgy.182, Zone 16 Manila City	Kalayaaan B&C, Bgy. Batasan Hill Quezon City	Bgy. Bayan-bayanan Municipality of Malabon
Date	February 13, 1998	February 19, 1998	February 21, 1998
Venue	Basketball Court	Barangay Hall	Elisa Esguerra High School
Attendance	■ 44 participants from Barangay ■ Representative from Dept. of Public Services in Manila City Hall ■ Representative from the garbage collection contractor (LEONEL)	■ Out of the 48 participants, 24 are residents of Kalayaan B (17) and C (7) ■ Representative from Task Force Operation Clean & Green in Quezon City Representative from the garbage collection contractor (TRANSTER)	■ 46 participants from Barangay ■ Representative from Municipality of Malabon
Concerns and Issues	■ Irregular collection service ■ Truck already full when it arrives at some of the main streets ■ No communal bins ■ No pushcart for sweepers ■ Lack of cooperation of residents ■ Dumping of waste in esteros	■ Garbage truck is too small to accommodate all garbage ■ Irregular collection of garbage truck ■ Continued dumping at creek ■ Many areas with narrow streets are inaccessible ■ Lack of discipline and cooperation	■ No collection in inner alleys ■ Murky waste below and under a lot of houses ■ Street sweeper/collector cannot collect all waste in a day ■ Lack of storage bins ■ Murky waste under houses full emit foul odor
Suggested Solutions	■ Garbage should be properly bagged and put out when the truck or primary collector arrives. ■ Collection should be done daily at a fixed time. ■ Garbage container should be placed on the main street. ■ There should be 6 push carts to access the narrow streets. ■ Enforcement of traffic laws to make the streets passable. ■ Garbage truck should blow its horn or ring a bell to announce its arrival. ■ Barangay officials should conduct an intensified drive on proper waste handling, proper drainage management as well as community cooperation.	■ Collection schedule should be at least 3-4 times a week. ■ Garbage truck should be big enough to accommodate all the garbage of the residents. ■ There should be 10 units of pushcarts to collect from narrow streets. ■ There shall be receptacles at collection points, i.e. drums ■ Implement ordinances on SWM	■ Provide communal bins in the residential area ■ Provide pushcarts & more collectors ■ Households should bag their waste ■ Remove waste from under houses ■ Conduct general cleaning activity ■ Conduct educational campaign on SWM ■ Enforce existing SWM ordinance
Pilot Area	Bgy.182, Zone 16 Manila City	Kalayaaan B, Bgy. Batasan Hill Quezon City	Bgy. Bayan-bayanan Municipality of Malabon

Vision	A clean and green community where collectors clean promptly, bins strategically installed and residents cooperating all the time.	Garbage-free community where garbage collectors come on time and residents are disciplined in handling their own waste.	"MALINIS , MABANGO, KAAYA-AYANG BAYAN-BAYANAN" Clean, Fresh and Pleasant Bgy. Bayan-Bayanan
Stakeholders	Residents Barangay officials Pushcart collectors LGU-DPS Private collector (LEONEL) MMDA JICA SK	Residents Barangay officials Pushcart collectors LGU-environmental officials Private collector (TRANSTER) MMDA NGO Religious Groups City Engineers Teachers JICA	Residents Barangay officials Pushcart collectors LGU NGO / POs / Civic Religious Group SK
Consensus	1. Use of pushcart for small streets. 2. One container for wet garbage and one container for dry garbage at the end of each small street. 3. Regular schedule of the assigned contractor. 4. Existing ordinances to be implemented. 5. Others agreements include: ▪ P500/month from barangay funds. ▪ P1.00/plastic bag/ collection. ▪ P2.00 to 5.00 /family.	1. Regular collection schedule of the assigned contractor at least 3-4 times a week. 2. Existing ordinances to be implemented. 3. There is a need for push carts for inner / small streets. 4. People living in alleys/ inner roads need storage/ containers for garbage. 5. Residents maintain cleanliness with their community. 6. MMDA/JICA will integrate all their solutions into an action plan and will present them to the barangay officials. The barangay will disseminate the information to the concerned residents and stakeholders.	1. Residents are requesting pushcart in narrow street. 2. They are willing to pay P2.00 to P3.00 pesos per plastic bag of garbage. 3. They are willing to have a general clean up day with the help of all agencies concerned. 4. Fixed time for collections of garbage at least 2 to 3 times a week. 5. Look for a new collection point. 6. They need additional primary collectors/ sweepers. 7. Enforce all ordinances, (Regulation 96-009-anti littering law, PD 825). 8. Integrate all their issues/ solutions into an action plan; this action plan will be presented to the official and disseminate to the residents and all the stakeholders.



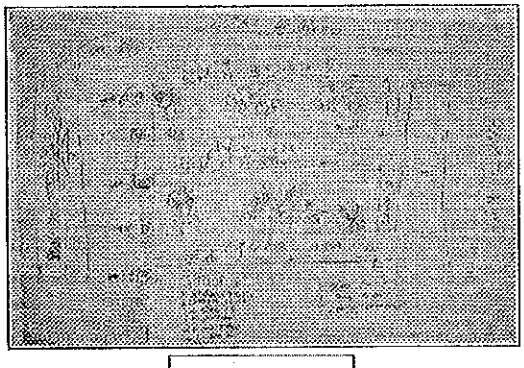
Participation of a barangay official

Participation of an LGU official

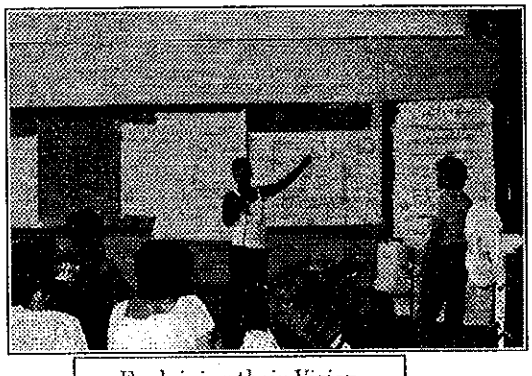


Participants express own perception with color cards in FGD

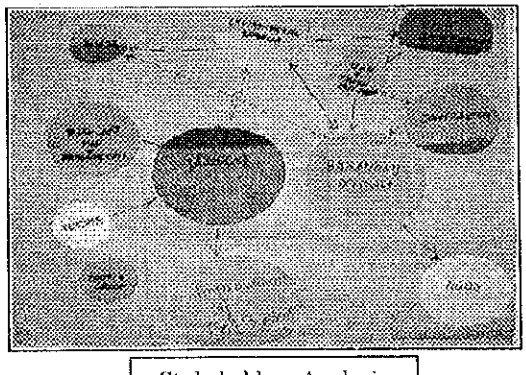
Group Visioning



Vision Drawings



Explaining their Vision



Stakeholders Analysis

1.7 Action Plan

(1) Consultation/Arrangement

At the stage where draft action plans for each pilot site have already been prepared, a series of consultations had to be conducted to thresh out issues that directly concern the residents despite expressed approval of the barangay officials. The two main issues that stalled the finalization the action plans were a) installation site of collection bay (communal storage facility), and b) waste collection service fee.

Concerns regarding the installation of collection bay varied from perceived mismanagement, thus, creating illegal dumping and intolerable foul emissions, and unavailability of site within the area/barangay. Through consultations, countermeasures have been arrived at, namely: (i) non-construction of a collection bay; (ii) installation of movable storage facility, and (iii) continued use of a private property by securing permits from government officials.

On the other hand, the issue on collection service fee involved the amount to be collected and the manner by which this is going to be paid by the residents. As a result, agreements included a fixed amount to be paid by the barangay government to primary collectors from its regular budget in addition to voluntary contribution from residents; in Malabon, a mandatory service fee from households to pay the monthly salary of the primary collectors

Street meeting with residents near proposed site for collection bay

Table 1.4 Issues/Problems and Countermeasures

	Collection Bay		Collection Service Fee	
	Problem	Countermeasure	Problem	Countermeasure
BGY.182 (Manila)	Nearby residents did not accept installation.	No collection bay installed; residents/ officials identified 3 collection points.	Residents did not accept mandatory fee. LGU-City Hall did not approve inclusion of voluntary fee.	Basic allowance is P500 from Barangay. Fee was made voluntary. Issue not forced because residents approved anyway.
Kalayaan (Quezon)	Construction of permanent structure was disapproved by residents living nearby.	Only one permanent structure was constructed outside residential area; 2 units of movable type were installed.	Residents did not accept mandatory fee.	Basic allowance is P1,000. Fee was made voluntary.
Bayan-bayanaan (Malabon)	Site is a private property. Also, no site is avalable within the barangay.	Secured permit to use from concerned LGU official.	Residents could not agree on the amount to give.	Proposed P10 per month per household was approved to be collected by Bgy. office.

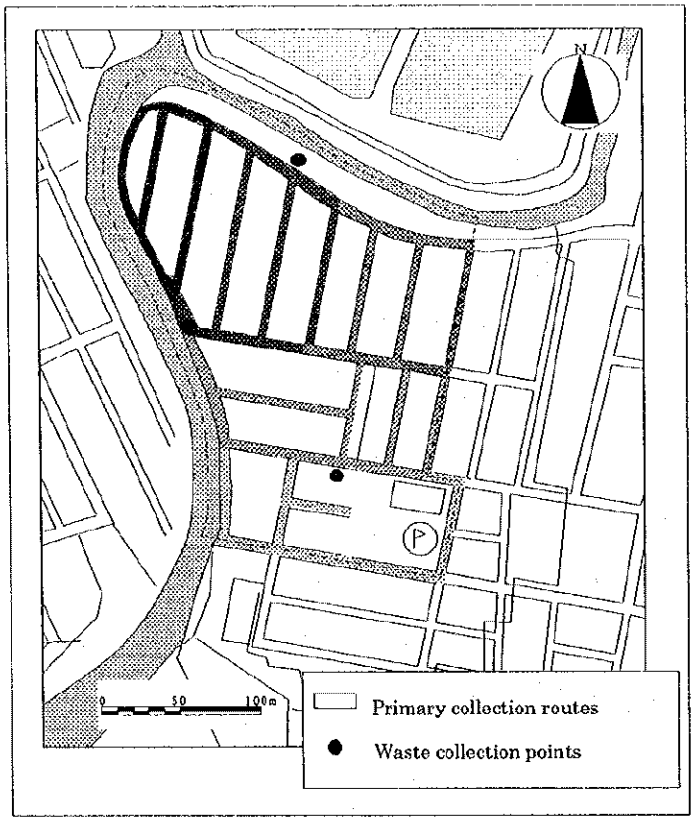
(2) Summary of Action Plan

The Action Plan for each pilot site is summarized below and detailed in Annex 1.

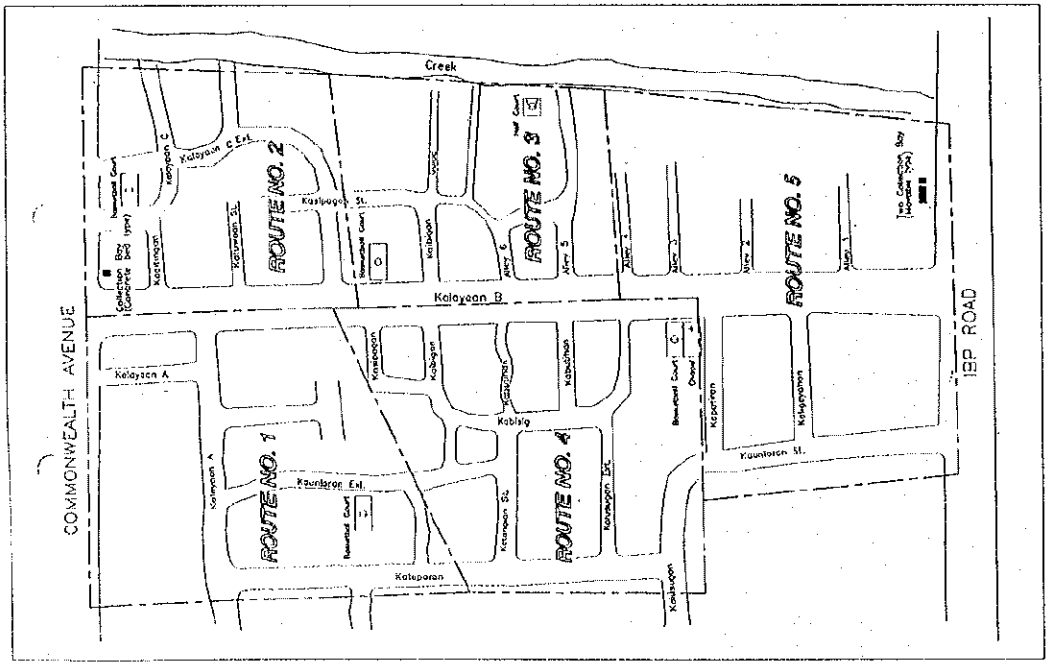
Table. 1.5 Action Plan for the Improvement of Collection System

Pilot Area	Bgy.182, Zone 16 Manila City	Kalayaaan B&C, Bgy. Batasan Hills Quezon City	Bgy. Bayan-bayanan Municipality of Malabon
Objectives	1. Establish a regular collection schedule for the contractor and primary collector that will be carried out even after the pilot project period. 2. Introduce a primary collection system by the use of pushcarts. 3. Identify collection points. 4. Establish a collection service fee for the primary collectors. 5. Establish responsibilities of stakeholders.		
Plan Framework	1. The action plan is based on the result of the focused group discussion and further consultations. 2. It will commence with a " Clean-up Day" that will be participated by the stakeholders. 3. The pilot project will be conducted until the end of the year. It shall be monitored and evaluated.		
Contents			
1. Discharge by Household			
- Frequency	once daily	MWF	once daily
- Time	7:00 - 9:00 a.m.	7:00 - 9:00 a.m.	7:00 - 9:00 a.m.
- Place	front of premises	front of premises	front of premises
- Container	plastic bag, sack, etc.	plastic bag, sack, etc.	plastic bag, sack, etc.
2. Collection by Primary Collector			
- Frequency	once daily	MWF	once daily
- Time	7:00 - 9:00 a.m.	7:00 - 9:00 a.m.	7:00 - 9:00 a.m.
- Collection System	curbside collection	curbside collection	curbside collection
- Collection Route	(refer to Map 1)	(refer to Map 2)	(refer to Map 3)
- Discharge points	roadsides	Collection bays	Collection bays
- Equipment	(refer to Map 1) pushcart, broom, shovel	(refer to Map 2) pushcart, broom, shovel	(refer to Map 3) pushcart, broom, shovel
3. Collection Bay			
- Type & Number	no collection bay	fixed type : 1 unit movable type : 2 units	movable type : 2 units
4. Collection by LGU/Contractor			
- Frequency	daily	MWF	daily
- Time	10:00 a.m.	10:00 a.m.	10:00 a.m.
- Collection System	point collection	point collection	point collection
5. Institutional			
- Salary/allowance for collector	P500 / month (previous allowance for street sweeper)	P1,000 / month	P2,000 /month
- Source of revenue	Barangay budget	Barangay budget	collection service fee
- Collection service fee	Voluntary basis	Voluntary basis	P10.00 / household

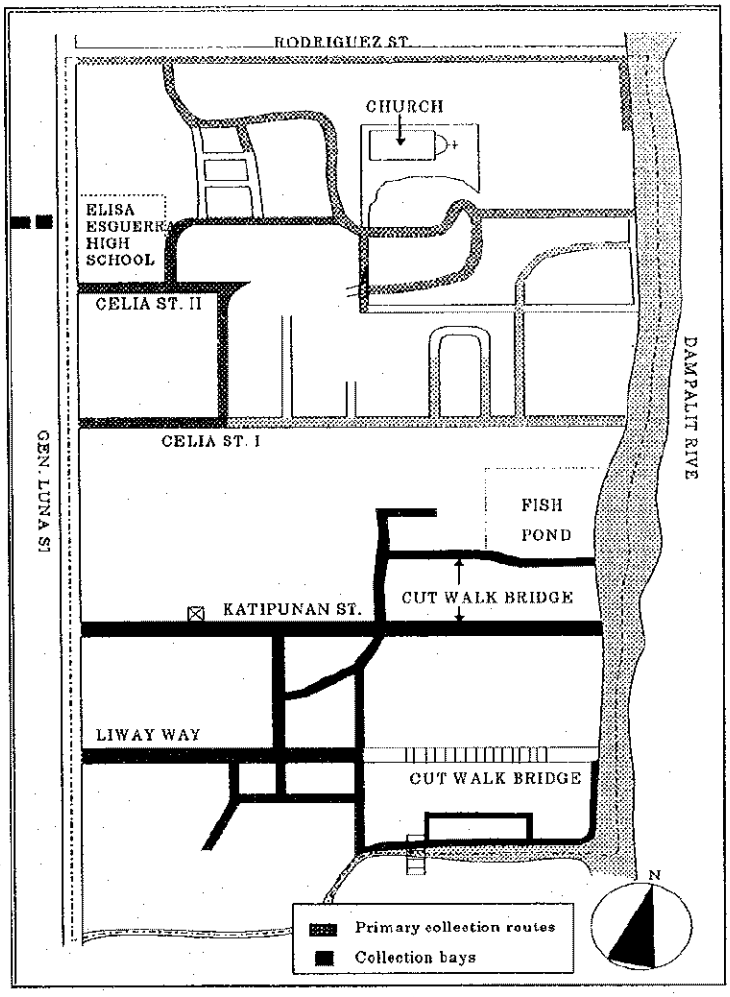
Responsibility / Accountabilities	
1. Residents	- Store and discharge waste according to collection schedule. - Keep premises clean at all times. - Give voluntarily to the primary collector. (Bgy.182, Kalayaan) - Collection service fee is P10.00/ month /household.(Bayan-bayanan) - Participation in "Clean-up Day" that will kick-off implementation of the pilot project.
2. Barangay officials	- Appoint primary collectors and issue identification card. - Pay the primary collectors on a monthly basis. - Prepare contract with primary collectors; define responsibilities. - Inform all the residents of the household waste discharge method, frequency and time. - Encourage the residents to give the primary collectors "financial token" each time their household waste are collected. - Decide the management system of pushcart and collection points. This should be contained in the contract. - Monitor the implementation of the new collection system. - Support the "Clean-up Day" activity and ensure participation of all residents. - Enforce existing ordinances on anti-littering (MMDA regulation 96-009) and others that affect collection system, i.e. traffic rules. - Secure the acceptance of the residents living near the collection bays. (Kalayaan, Bayan-bayanan)
3.Primary Collector	- Provide a reliable collection work on schedule, adequate coverage of route, proper handling of collected waste. - Operate and maintain pushcarts and discharge points: maintain cleanliness of equipment / storage facility and avoid having them stolen / vandalized. - Use pushcart for garbage collection only. - Look clean (wear ID and hand gloves) and behave well (don't demand payment) during working time. - Consider garbage collection as the basic responsibility, not street sweeping. (Bgy. 182)
4. Residents Nearby Community Storage	- Accept installation of facility. - Monitor cleanliness, maintenance of facility. - Report to Barangay officials any mismanagement of facility.
5. LGU / Contractor	- Monitor performance of collection truck contractor in the pilot area. - Support the "Clean-up Day" by providing equipment, and sending staff to participate. - Dedicate a collection truck for the pilot area. - Provide regular collection service. Keep to the schedule. - Participate in the "Clean-up Day" - Maintain road-worthiness and cleanliness of truck. - Provide necessary paraphernalia of truck.
6. MMDA	- Provide 15 river aides and equipment to clean the esteros on "Clean-up Day." - Spearhead the "Clean-up Day" with the JICA and the Barangay officials coordinating the program.
7. JICA Study Team	- Provide pushcart and collection bay. - Supervise and monitor the entire pilot project.



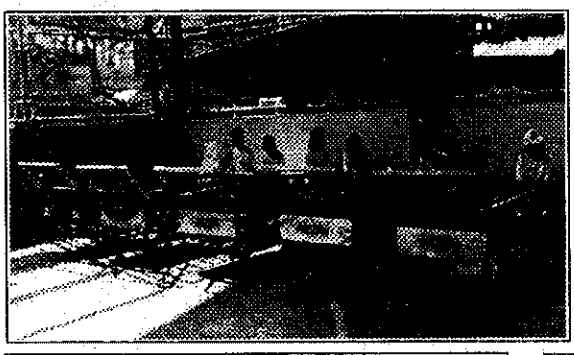
Map 1 Primary Collection Routes and Location of Waste Collection Points in Bgy. 182 in Manila City



Map 2 Primary Collection Routes and Location of Collection Bays in Kalayaan, Quezon City

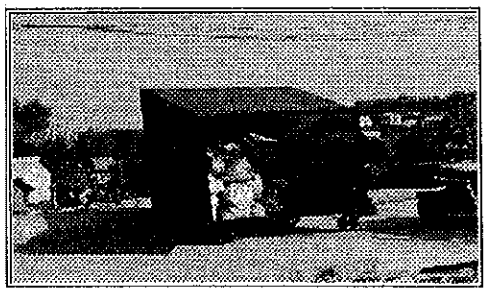


Map 3 Primary Collection Routes and Location of Collection Bays in Bgy. Bayan-bayanan, Malabon



Pushcarts donated by JICA

Fixed type and movable type of collection bay



1.8 Clean-up Day

Before starting the pilot project (new collection system by using pushcarts), a "Clean-up Day" was held in each pilot site. The purposes of the activity include the following:

1) To widely disseminate information about the new waste collection system for inaccessible areas,
2) To request the whole-hearted participation of residents to the new collection system, and
3) To directly involve LGUs concerned with collection service.

A ribbon-cutting ceremony for five pushcarts to "kick-off the project " was done by Malabon's First Couple.

Opening ceremonies were attended by some residents, LGU officials, barangay officials and the JICA-MMDA Study Team, highlighted by keynote speeches of Hon. I. A. Mathay and Hon. A. S.Vicencio, the mayors of Quezon City and Malabon municipality, respectively .

Clean-up Day in Malabon

Assignment of areas of responsibility for the clean-up was distributed to MMDA JICA Study Team, barangay officials, primary collectors, LGU street sweepers and MMDA river-aides.

There are four main streets in the site. Each main street and the streets within the pilot area itself were cleaned-up by a JICA-MMDA inspector, two to four LGU street sweepers, two barangay officials, and pushcart collectors together with residents. Furthermore, 40 MMDA river aides were assigned to fishpond areas, under water houses and the banks of Dampalit river. Main clean-up day activities were as follows ;

- Public information about the activity/project,
- Distribution of T-shirts, stickers and sacks to the residents who participated in the activity,.
- Sweeping of alleys, unclogging of drains, removal of accumulated waste from "under houses,"
- Collection of sweeping/garbage piles from the streets and creek by the primary collector and hauling to the collection bays using the pushcarts.

Clean-up day activity in Malabon (top photo) and in Manila (bottom photo)

1.9 Monitoring

The following surveys were conducted to verify the outcome of the pilot project.

(1) Public Opinion Survey
(2) Time & Motion Survey for Collection Vehicle
(3) Time & Motion Survey for Primary Collector
(4) Monitoring Survey

(1) Public Opinion Survey

(a) Objectives

A Public Opinion Survey (POS) was conducted before and during the pilot project in order to achieve the following objectives:

1) to compare the change of residential opinions on sanitation and waste management in community level, and
2) to determine the degree of understanding and cooperation of residents on the implementation of a new collection system.

(b) Methodology

i) Survey items

Direct interviews were conducted to determine the opinion of residents on a number of waste-related items, e.g. collection service, manner of waste discharge, collection service by LGU and primary collector, sanitary condition of the community, etc. The questionnaire used is shown in Annex 2.

(ii) Survey schedule

The POS was conducted in the pilot areas following the schedule shown below:

Pilot Areas	Before Project	During Project
Barangay 182, Zone 16, Gagalangin, Tondo, Manila	Feb.12, 1998	March18,1998
Kalayaan B St., Barangay Batasan Hills, Quezon City	Feb.18, 1998	March20,1998
Barangay Bayan-bayanan, Malabon	Feb.17, 1998	March19,1998

(iii) Number of samples

The total number of households interviewed is 300 broken down as follows: 50 samples for each area 'before project' and 50 samples for each area 'during project.' The same households were interviewed 'before' and 'during' pilot project.

(iv) Results of survey

A summary of the results is given below. Annex 3 provides details of the survey results.

1) Eighty-seven percent of residents received regular collection service 'during project' as opposed to only 45% 'before project';
2) Eighty-three percent of residents received regular garbage collection service 'during project,' while it was only 33% 'before project;'
3) Percentage of residents who used plastic bag and sacks as storage container increased from 49% 'before project' to 62% 'during project,' while the percentage of those using plastic bags and sacks as discharge container increased from 75% to 81%;
4) An increase from 25% to 57% of residents who discharged their waste at a fixed time;
5) Residents who are satisfied with the collection service increased from 48% 'before project' to 89% 'during project'; and
6) The percentage of residents who rated the sanitary conditions in the community to either be good or satisfactory increased from 55% to 90%.

(2) Time & Motion Survey for Collection Vehicle

(a) Objectives

One of the objectives of the pilot project is to verify the effective linkage between existing collection system provided by local government and/or private contractor and primary collection adopted in the pilot project.

A Time & Motion Survey (TMS) for collection vehicle was conducted 'before' and 'during' pilot project to compare data on collection time, distance, cooperation of residents, collection work of collectors etc. The objective of the survey is to verify the increase of collection efficiency through introduction of primary collection.

(b) Methodology

(i) Survey items
- Time, distance and volume of waste collected and hauled,
- Types of containers used,
- Collection routes, and
- Observations on household participation and level of service.

(ii) Survey schedule

The survey was conducted according to the following schedule:

Pilot Area	Before Project	During Project
Barangay 182, Zone 16, Gagalangin, Tondo, Manila	-	March 21, 1998
Kalayaan B St., Barangay Batasan Hills, Quezon City	March 09, 1998	March 25, 1998
Barangay Bayan-bayanan, Malabon	March 12, 1998	March 20, 1998

(iii) Results of survey

1) Collection Activity

Barangay 182 Zone 16 Gagalangin, Tondo, Manila

During Pilot Project: Barangay 182 Zone 16 is typifies an urbanized barangay in the metropolis. With a population of approximately 10,000 residents, solid waste management in the area is definitely a major concern. A part of the barangay, particularly that along Hermosa St., is near an estero, which is usually being used as a discharge place for garbage by the residents near the area. Collection and disposal of municipal solid waste is contracted by the city government to a private contractor LEONEL, with the dispatch area located at San Cristobal St., Paco.

Collection activities for the said barangay started at 8:47 a.m. along the two collection points within the barangay: one at Pagasa St. corner C. Tan St. and the second, at R. Cruz St. The collection vehicle under study was a six-wheeler compactor truck which has a capacity of approximately 10 cubic meters. The collection crew is composed of one driver and 2 helpers.

Traffic condition was light from dispatch/garage to the first and second trip. However, for the third trip in which the destination was to the project area, the traffic was moderate to heavy. In the project area, the roads are mostly in good condition. Slow movement of the collection vehicle was observed due to narrow roads and various private vehicles parked on both sides of the street.

Pushcart collectors with their respective pushcarts filled with garbage waited for the arrival of the collection truck in the said area. Residents appeared cooperative during collection time. There were certain parts of the street where garbage were piled up because the pushcart collectors could not load all the garbage of the residents. Most households brought their wastes to the street curb where the collection vehicle was routing for loading while some loaded their wastes directly onto the truck. In areas not accessible to the vehicle, the pushcart collectors did collecting in these

areas and they just loaded the collected garbage directly into the collection truck when it arrived. Storage containers used by households were of different sizes and different types. Residents used plastic bags, cartons, steel drums, plastic containers, rice sacks, and wooden boxes .

The study area is about 0.2513 hrs. drive away from the transfer station and approximately 3.48 hrs. from the dispatch area. The time consumed in the two collection station was about 0.4657 hrs. Transport and haulage required 0.3848 hours, and 2 mins. and 57 seconds for unloading of waste. For the day's collection activity at the study area, a total of 4.1313 hrs. were consumed.

Collection area is almost 9.17 km away from the dispatch/garage area. And about 6.4 km away from the transfer station. The distance of the first station from the second is 0.25 km. There were two collection points that were established in this route.

Kalayaan B&C, Barangay Batasan Hills, Quezon City

Before the Pilot Project: Collection and disposal of solid wastes in Quezon City is coordinated by the Task Force Clean and Green of the city government. However, collection is contracted out to several private companies, in which case the dispatcher is an MMDA personnel.

The study area is Kalayaan B St., Barangay Batasan Hills, Quezon City, The collection area and route are, to a certain extent, already pre-determined. Collection in this particular area starts regularly at 5:30 a.m. to 6:00 a.m., and is done everyday according to Mr. Marcelino Dobla, the dispatch officer from TranStar assigned in the area. The collection vehicle assigned during the study was a mini dump truck open type which has an approximate capacity of 8 cubic meters.

Morning inspection consists of checking of brake fluid, clutch, brake hose and tires which usually last for about 10-20 minutes. The garage and dispatch area is located along Commonwealth Avenue, just in front of the barangay office in Kalayaan B St. A trip ticket from the dispatcher allows the collection crew to start collection work. Collection crew consists of a driver and 4 collectors.

The traffic condition in the area is light, from the collection to disposal area. Slow movement of the collection vehicle was attributed to narrow streets and potholes. There are a few private vehicles parked on either side of the street, and sometimes on both sides, which make it difficult for the collection truck to pass through. The presence of the collection truck oftentimes obstruct the flow of traffic in the project area.

Household income levels in the area vary from low to middle income groups. Households bring out their waste only as the collection truck arrives. Some residents even approach the crew to give their waste in plastic bags.

In several occasions, waste were not properly placed in containers and were just stockpiled on the roadside. In this case, the crew had to shovel the waste into a plastic tray and then load it into the truck.

No uniform waste bin/container was used by residents. Common waste containers were plastic bags, plastic containers/buckets, carton boxes, nylon sacks, half drums, and *kaings*. The crew on top of the truck stockpiled the waste collected to maximize load capacity. Once the collection truck was full, the truck returned to the dispatch area to have the load checked before disposal. A total of 32 cu. m. of waste was collected in four (4) trips that were completed in approximately six (6) hours of operation. Collection time in four trips averages about 28 mins.

The collection distance totaled 2.67 kilometers in four trips. The disposal site is at the Payatas open dumpsite which is about 4.60 km away from the project area.

During the Pilot Project: The presence of two collection bays and five pushcarts within the study area, that were utilized for waste collection, made some changes with regards to the collection activities of TranStar in Kalyaan B. St. Collection activities in the area is now done only three times a week(Monday, Wednesday, and Friday only). The collection truck oftentimes does not pass through the narrow street of Kalayaan B. It only stops by the two collection bay located along Commonwealth Ave. and along IBP road. These two collection bays consist of a fixed type and a movable one. The fixed type is situated along Commonwealth Ave. and the movable one is located along IBP road. There are five pushcart collectors assigned in different areas within Kalayaan B St.. And each brings the garbage they collected from their respective routes into the collection bay. However, during the time of the survey, the mini dump truck collected about 13 stations in Kalayaan B St., aside from its collection from the collection bay at the IBP road.

The loading time of the garbage from the collection bay stationed along IBP road is approximately 35 mins. and 28 seconds. It takes only 6 mins. and 31 seconds for the collection truck to reach the area of the collection bay along IBP road. The pushcart collectors usually are the ones now collecting among the residents directly, especially in those areas where the collection truck cannot pass through.

<u>Barangay Bayan-bayanaan, Malabon</u>

Before the Pilot Project: Collection and disposal of municipal solid waste is done by the local government unit of Malabon and a private collection system. In this municipality, the disposal site (Catmon) also serves as a dispatch area for the LGU's equipment and personnel. Their collection activities start regularly at 12:00 a.m., collecting waste from the markets, major thoroughfare and later in the day, collection of waste among the barangays. The collection vehicle is owned by the LGU and it has a capacity

of 8 cubic meters. The crew is composed of one driver and 3 helpers. The project area in Malabon is Barangay Bayan-bayanan. During the time of survey, the collection truck collected first at the project area and made three (3) trips. The collection area is 10 mins. away from the dispatch area. The time consumed in the three trips made in the project area is about 4.3323 hrs. It took 1min and 57 secs in unloading the garbage at the disposal site. The disposal area is about 3.04 kms. away from the prooject area and it took about 22 mins. and 53 secs. for the truck to reach the dumping area.

Storage containers of different sizes and different types were observed. Residents used plastic bags of different sizes, drums, plastic containers, rice sacks, carton boxes and cans..

Collection crew cooperated with each other. The crew on top of the collection vehicle also sorted recyclable materials. At the disposal site, the sorted recyclable materials that were stored in sacks were first unloaded before the vehicle proceeded to the dumping area.

Traffic condition is light from the dispatch/disposal to collection area and vice versa. Roads serve two-way traffic and are generally in good condition. However in the collection area, the flow of traffic is one-way, thereby, good flow movement of the collection vehicle was observed due to the traffic situation. Likewise, the presence of the collection vehicle oftentimes created traffic in the collection area.

The total distance of collection area including other trips is 7.30 km. In the waste collection area, one collection point was established.

During the Pilot Project: The installation of a movable collection bay in the project area and the provision of pushcarts have made a difference in the collection activities in the area. Aside from the daily collection at 12:00 a.m., a collection in the morning is being done in the area, between 7:00 a.m. – 11:00 a.m. The pushcart collector's primary function is to collect from the residents living within the project area, particularly those within the narrow alleys and those who live far away from the collection bay, which is located in front of the barangay office of Barangay Bayan-bayanan. Collection time from the collection bay took about 51 mins. and 5 secs. The dumping site is about 13 mins. away from the project area and is about 3.16 kms. away.

The data sheets used and routing of collection vehicles for the time and motion survey are shown in Annex 4 and Annex 5 respectively.

2) Time Distance and Amount of Waste Collected

The survey yielded the following results:

i) Barangay 182

	Before Pilot Project[1/]			During Pilot Project[2/]		
	1st trip	2nd trip	3rd trip	1st trip*	2nd trip*	3rd trip
Collection Time	-	-	-	55'57"	32'48"	43'34"
Travel Time	-	-	-	17'32"	11'21"	3'23"
Total Working Time	-	-	-	1.13'29"	44'09"	46'57"
Travel Distance	-	-	-	8.4 km	2.4 km	0.25 km

Note: * indicates that the project area was not covered.

ii) Kalayaan B&C

	Before Pilot Project				During Pilot Project		
	1st trip	2nd trip	3rd trip	4th trip	1st trip	2nd trip	3rd trip
Collection Time	21'04"	33'56"	23'58"	9'44"	21'50"	30'12"	41'40"
Travel Time	2'11"	2'18"	2'26"	17'47"	4'19"	13'26"	10'43"
Total Working Time	23'15"	36'14"	26'24"	17'31"	26'09"	43'38"	52'23"
Travel Distance	0.16 km	0.48 km	0.79 km	1.24 km	4.33 km	1.22 km	6.1 km

iii) Barangay Bayan-bayanan

	Before Pilot Project[3/]			During Pilot Project[4/]	
	1st trip	2nd trip	3rd trip*	1st trip	2nd trip
Collection Time	37'15"	24'38"	76'17"	51'05"	30'34"
Travel Time	0	0	0	0	0
Total Working Time	37'15"	24'38"	76'17"	51'05"	30'342
Travel Distance	0	0	0	0	0

Note: * indicates that the project area was not covered.

(3) Time & Motion Survey for Primary Collector

(a) Objectives

The Time & Motion Survey for primary collector was conducted to observe the work of collectors, the degree of cooperation and understanding of residents on the pilot project, and other related aspects.

(b) Methodology

(i) Survey items
- Time, distance and volume of waste collected and hauled,
- Types of containers used,
- Collection routes, and
- Observations on household participation and level of service.

(ii) Survey schedule

The survey was conducted according to the following schedule:

Pilot Area	Date
Barangay 182	March 20, 1998
Kalayaan B St.	March 20, 1998
Bgy. Bayan-Bayanaan	March 25, 1998

(iii) Results of Survey

1) Collection Activity

Barangay 182 Zone 16 Gagalangin, Tondo, Manila

All pushcart collectors were formerly barangay street sweepers.

Primary Collector No. 1 - Mr. Totoy Garcia

He starts his activity by sweeping the streets between 6:30 - 7:00 in the morning and then he starts to collect the garbage from the residents. Sometimes he gets some voluntary contributions from the residents, but in most cases he does not receive anything. After the collection, he then waits for the arrival of the garbage truck. He also assists the collection crew in transferring the garbage into the collection vehicle. After the departure of the collection truck, he sweeps the surrounding area and cleans the pushcart. After this, he parks and secures the pushcart along Pag-asa St.

Primary Collector No. 2 - Mr. R. Francisco

Mr. Francisco starts collecting much earlier, sometimes before 7:00 a.m. Like Mr. Garcia, he is sometimes able to collect some contribution. He usually makes a maximum of three trips a day. And sometimes only one trip, when he has to sell sweet corn. He makes it a point to finish his job earlier when he is going to sell sweet corn. Sometimes he also assists in transferring the garbage into the collection vehicle and then proceed in cleaning the pushcart and parking it to safety.

Primary Collector No. 3 - Mr. D. De Guia

He starts the collection from 6:30 - 7:00 a.m. and finishes at around 9:00 a.m. Unlike Mr. Francisco and Mr. Garcia, he cleans his pushcart and parks it to safety near his house along Hermosa Street. He receives daily contribution from the residents. He segregates recyclable materials that he can sell to gain some profit in his collection.

Primary Collector No. 4 - Mr. J. Galoso

Collection activity of Mr. Galoso starts at 6:30 - 7:00 a.m. and he usually finishes the collection by 8:30 a.m.. He makes a minimum of two trips and a maximum of three trips. He sometimes gets a cigar from the residents and sometimes monetary contributions at the latter days of the monitoring. He often times helps Mr. De Guia collect some recyclable materials. He parks the pushcart near his house at G. Santos Street.

Primary Collector No. 5 - Mr. B. De Guzman

He starts collecting at around 6:30 to 7:00 a.m. and finishes between 8:30 - 9:00 a.m. When he still dumps at waste collection 3 Hermosa cor. R. Cruz, he waits for the collection truck and helps in transferring his collected garbage into the truck. He cleans the pushcart and parks it at Hermosa St., cor. Taladtad St. He makes a minimum of two trips and a maximum of three trips daily.

Kalayaan B St., Barangay Batasan Hills, Quezon City

Six primary collectors conducted the garbage collection activity in this project area. They were supervised by barangay Councilor Elias Gamboa. Since there were only five pushcarts, two of the members share in one pushcart. They were given a respective area of responsibility by Councilor Gamboa. Two of the members do collection in the northern part along Commonwealth; the other two members do collection in the mid-section of the project area, and the remaining member, in the southern part along IBP road.

- Collection Time : Collection activity in the project area is scheduled on Monday, Wednesday and Friday only at around 6:00 a.m. up to 10:00 a.m.

- Collection Fee : Aside from the agreed 2,000.00 pesos per month compensation for each primary collector, they also received voluntary contribution from the residents averaging 40.00 pesos each per collection day.

- Pushcarts and Collection Bay : Primary collector does the cleaning of their respective pushcart after every collection day. They bring home their shovels for safekeeping.

The collection bay remains dirty because the private collector has no interest in cleaning the scattered left-over garbage inside and outside the bay.

Barangay Bayan-bayanaan, Malabon

Collection activities by the pushcart collectors usually start at around 6:30 in the morning and ends at 11:30 a.m. The five pushcarts are stored beside the residence of the Barangay Captain Felix Clemente, Jr. of Brgy. Bayan-Bayanan, Malabon. There are five pushcart collectors, namely: 1) Mr. Leopoldo Aragon Sr.; 2) Mr. Leopoldo Aragon, Jr.; 3) Mr. Ernesto Epawra; 4) Mr. Joselito Paragas and 5) Mr. Ricardo Dy.

Barangay Bayan-bayanan is basically composed of five major streets: Rodriguez St., Celia I St., Celia II St., Katipunan St., and Liwayway St. And these routes are assigned to the five pushcart collectors where they are tasked to collect the garbage of all the residents and to keep the surroundings of that area as clean as possible. During collection some of the residents, particularly those living in Celia I. St., and Rodriguez St. give voluntarily a small amount of money (usually between 2.00 – 5.00 pesos) to the pushcart collectors. Sari-sari store owners and those who sell cooked food usually give the collectors some food or coffee for free. If they have already collected all the garbage, the collectors usually sweep the streets they are assigned to and sometimes clean the canals as well. Some residents provide rice sacks to the primary collectors when they are sweeping the street and cleaning the canals. The disposal area is located in front of the Barangay Hall of Bgy. Bayan-bayanan. It is a 2.0 m x 3.0m steel collection bay where the primary collectors unload all the collected garbage. The garbage at the steel collection bay usually is being collected at 7:00 a.m. and at around 10:00 a.m. by the LGU collection truck. The pushcart collectors usually bring with them broom sticks, dustpans and metal containers when collecting garbage and when cleaning their assigned areas. After the collection is finished, they usually sweep the wooden flooring of the pushcart of any excess garbage before returning the pushcart at the storage area.

The data sheets used and routing of primary collectors for the time and motion survey are shown in Annex 6 and 7 respectively.

2) Time, Distance and Amount of Waste Collected

	Barangay 182	Kalayaan B	Bgy. Bayan-bayanan
Working Time	6:55 - 8:24 (1 hr. 29 mins.)	6:17 - 10:20 (3 hrs. 3 mins.)	6:34 - 11:42 (4 hrs. 8 mins.)
Number of Trips	2	4	4
Dumping Time at Collection Point	39'	26'	45'
Travel Distance (m)	433	3,233	-
Collected Waste Volume (cu.m)	2.4	3.2	3.5
Collected Waste Vol. Per Trip (cu.m.)	1.2	0.8	0.88

(4) Monitoring Survey

A monitoring survey is being conducted in the three pilot project sites to validate the impact of the proposed system and to identify the issues and improvement points.

(a) Monitoring Survey by JICA (March, 1998)

Barangay 182, Manila City

1) Some residents living near the collection point in Hermosa Extension are not in favor of the arrangement. The barangay decided to use another area near Estero de Sunog Apog as the collection point.

2) Complaints on non-availability of collection trucks as scheduled were also heard from the residents in Estero de Sunog Apog. There are also times when the primary collectors have to wait for the arrival of the collection truck.

3) Collection by the primary collectors is completed at 9:00 a.m. The primary collectors make two to three trips a day collecting garbage from their areas of assignment. To avoid scattering of garbage, the primary collectors are requesting that plastic bags/sacks be provided to the residents.

4) Primary collectors receive voluntary contribution from P10.00 to 20.00 per day.

Kalayaan, Quezon City

1) The delivery of big size movable collection bay to the project site was late for the first collection day. The small size movable container, which is placed at the IBP road, can accommodate three pushcart loads of garbage only. Because of this, the fixed collection bay has reached its full capacity already. As a result, piles of garbage is observed scattered around the fixed collection bay. The gate of the small size collection bay, however, was closed after being filled up by garbage. Foul odor and littering at the surroundings was not observed.

2) Transtar, the private contractor assigned in the area, sent a $5m^3$ dumptruck at 10:30 am. The private contractor made three round trips collecting garbage, the capacity of which is equivalent to two trucks from the fixed collection bay and one truck from IBP road. The barangay-owned dumptruck ($5m^3$ capacity) also hauled garbage from the collection bay to Payatas and made one trip in the process.

3) The five primary collectors completed their task after 10 a.m. Plastic containers were not used by some of the residents to store their garbage. Bulky wastes, such as big drums, were received from the residents by the primary collectors. The primary collectors were given money by some of the residents.

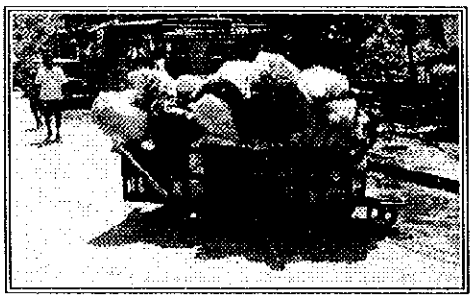
Barangay Bayan-bayanan, Malabon

1) Structural defects were found in the movable collection bays. It was constructed with slits, thus allowing the unpacked garbage to fall out. Repair of the communal storage will be carried out by the contractor under the supervision of the barangay chairman. It was reported that the collection bay is also being used by some of the residents of Bgy. Flores, an adjacent barangay.

2) The schedule of LGU collectors is not being followed. The fixed schedule is 10:00 a.m. - 12:00 noon; however, the schedule being followed is from 4:00 a.m - 7:30 a.m. The responsible person promised to follow the fixed schedule of collection.

3) So far, the residents have reacted favorably with the new collection system. They voluntarily give P2.00 - P3.00 a day to the primary collector. A suggestion was even made to hold a general clean up day every Saturday or Sunday. A request, however, was made to the barangay chairman and the primary collectors that the collection bay be kept clean.

The Study Team is requesting MMDA and LGUs to continue the monitoring and inspection regularly. Quezon City has a plan to extend the collection system to other inaccessible areas.



Barangay 182, Manila City

(b) Monitoring Survey by MMDA (April-July, 1998)

MMDA continued with the monitoring of the pilot areas from April to July 1998. Following is their report:

Barangay 182, Manila City

Date: April 20, 1998 *Time: 1:30 p.m.* *Weather: Fair*

1) The garbage was already collected by the private contractor. The primary collector properly parked the pushcarts in the collection point. The pushcarts were clean and well maintained.
2) The cleanliness of the area is observed. The environmental condition of the area was improved as compared to our previous visit. There are no piles of garbage scattered in the area. The estero/creek is free from clog-causing materials and water is flowing smoothly.
3) The residents are satisfied with the project. It improved the collection system of the area. They are willing to give P1 to P2 to the primary collector.
4) Benjamin de Guzman, the primary collector assigned at Hermosa Extension, makes four trips daily. He receives P500/mo. from the barangay. He was not in complete uniform. He needs gloves for his own protection.
5) The barangay chairman and Bgy. Officials/Chairman are very supportive of the project. They always monitor the collection activities to make sure that the garbage is properly place in the pushcarts.

Date: April 27, 1998 *Time: 9:00 a.m.* *Weather: Fair*

1) It was observed that one primary collector, Juanito Galoso used the pushcart for another purpose - to carry water from one house to another.
2) Danilo de Guia, the primary collector assigned at Benita Ext., makes two trips daily and he receives P80 from the residents while Reynaldo Francisco makes one trip and receives P30 from residents.
3) The vicinity is clean. There were no piles of garbage in the area.
4) The residents are very happy with the result of the project. In return, they cooperated by putting their garbage in bags/sack and by giving some amount of money to the primary collector.

Date: May 18, 1998 *Time: 12:55 p.m.* *Weather: Fair*

1) The barangay officials and residents conducted general cleaning activities after the election. They also removed/scraped the election poster off some walls.
2) The pushcarts are full of garbage, still waiting the arrival of the collection truck .
3) No primary collector was interviewed during the visit because they were not available, having completed their tasks already.
4) Bgy. Chairman Unamayor informed us that he terminated the services of one of the primary collectors, Mr. Juanito Galoso.

Date: June 5, 1998 *Time: 8:00 a.m.* *Weather: Fair*

1) The pushcarts are full of garbage and are parked in the collection points. According to one of the primary collectors, the contractor has not collected the garbage for almost three days.
2) Primary collector Ernesto Garcia was not in complete uniform. He only makes one trip per day. He receives P25 from the residents and has not yet received his salary from the barangay for almost 5 months.
3) The area is not in satisfactory condition. Piles of garbage are observed in the vicinity because the private contractor has not yet collected the waste.
4) The residents are complaining because they are affected by the foul odor coming from the uncollected garbage in the pushcarts.
5) Bgy. Captain Unamayor is complaining about the irregular schedule of garbage collection by the contractor Leonel.

Date: July 10, 1998 *Time: 1:45 p.m.* *Weather: Fair*

1) The garbage was already collected by the contractor. The pushcarts are clean and in good condition, and are properly parked in the collection point at Hermosa Street.
2) The office of the barangay chairman is still processing the salary of the primary collector which has accumulated for 6 months.
3) No primary collector was interviewed during the visit because they have already completed their task, and are no longer in their areas of assignment.
4) The residents are satisfied with the collection project. It improved the collection system in the area, although there were some problems like foul odor caused by the uncollected pile of garbage in the pushcarts that was not collected by the garbage truck.
5) The barangay chairman informed us that he plans to transfer the collection point beside the creek at Mendiola St., cor. Pagasa Ext. (Sunog Apog) because the residents are complaining about the foul odor caused by the uncollected garbage.
6) The contractor did not comply with the Memorandum of Agreement as he was unable to have the garbage collected regularly.

Date: July 31, 1998 *Time: 8:30 a.m.* *Weather: Fair*

1) For the collection points, the fixed schedule of daily collection by the private contractor was not being followed. Instead, collection is done thrice a week only. As a result, collection by the primary collectors is done weekly in every street with no fixed schedule.
2) When there is no schedule of garbage collection, the primary collectors park the pushcarts upside down to prevent the resident from putting their garbage in the pushcart.
3) The primary collectors have already received their uncollected salaries for the previous six months.
4) Coordination with Mr. Recato and Engr. Nicodemus of the Engineering Office, District III, Manila, regarding the transfer of location of the collection point at Mendiola St. cor. Pagasa Ext. (Sunog Apog) is still on-going.

Evaluation of Bgy. 183 Pilot Project

The project was a partial success based on our observation. According to the information we gathered from interviews with the residents and barangay officials, the environmental condition of the area has improved. There are no traces of waste materials in the estero/creek; the vicinity is clean and there are no piles of wastes seen in the area because the collection system improved. The residents are very happy with the results of the project. The only problem they have is the irregular collection schedule of the contractor resulting in the accumulation of waste causing foul odor. The regular collection schedule of the contractor is the main factor for the complete success of the project.

Kalayaan, Quezon City

Date: April 20, 1998 *Weather: Fair*

1) General sentiment of the residents at Kalayaan C is positive. They acknowledged the support provided to them particularly the pushcarts and movable containers assigned to their area. They also commended the performance and attitude of the primary collectors. In return, they showed cooperation by doling out small amounts for the collectors.
2) The collection bay along Commonwealth Ave. is also being maintained by the primary collectors. Most of the garbage are now contained in plastic bags. This makes it possible for the collectors to pile the garbage properly and keep them in order. No bags of garbage were observed at the sides of the street.
3) The odor emanating from the creek has minimized. After the clean -up day, the cleanliness of the creek has improved. No new garbage was thrown by the residents. Cooperation from everyone is expected to maintain the cleanliness of the creek. The residents are looking forward to another clean-up day.
4) The doors and lock of one movable container are missing. Fortunately, it was recovered by Barangay Captain Laxina from a nearby junkshop. Capt. Laxina committed to reinstall this.
5) The primary collectors received their first salary last April 17, 1998. They were satisfied with the income from the barangay and the residents. According to them, the residents are slowly getting used to their collection schedule. They requested that they be provided with raincoats and boots come rainy season.

Date: April 27, 1998 *Weather: Fair*

1) Pushcarts of the primary collectors were observed to be in good condition and parked correctly in front of Capt. Laxina's office along Commonwealth Avenue.
2) Residents along IBP road are clamoring for the removal of the movable containers installed by the Study Team. This move is being led by a certain Dr. Belen Guevara-Sugon who has a dental clinic near a movable container to have . She complained that her patients are being affected by the foul odor coming from the container. Todate, 40 people have signed a petition letter addressed to the Barangay Captain. One of the residents, Ms. Evelyn Avelis, reported that one child almost died due to continuous vomiting.
3) The doors of the movable container were still missing. This will be taken up

with Capt. Laxina.

Date: May 5 (Discussion with Barangay Captain)

1) Through telephone, I relayed and discussed the petition letter with Capt. Laxina. He was emphatic that he will disapprove the petition and will not transfer the container to another location. Being the Barangay Capt., he stressed that they should follow his decision. He added that MMDA personnel acknowledged their barangay's request and visited them for five days to assist in cleaning the creek. He also spent P 750/day for the food and brought 100 sacks for the clean-up drive.
2) The issue of the missing doors of the removable container was taken up.

Date: May 18, 1998 *Weather: Fair*

1) The following primary collectors received their allowances:

Collector	Amount Received	Average
Rene De La Rosa	Max. of P 40, Min. of P 20	P 30.00
Crispin Cantaros		80.00
Benedicto Panganiban		80.00
Jose Olado	Total - P 150.00, thrice given	50.00

2) Mr. Celing of Transtar was interviewed. He mentioned that on Mondays, there are two trucks, one big and another small, collecting garbage along Commonwealth. There is another big truck servicing IBP road.
3) It was observed that the roof of the fixed container along collection bay is beginning to collapse.
4) Mr. Jose Dingwan, the caretaker of the movable container along IBP Road assigned by Dr. Gamboa, mentioned that he was encountering difficulty requesting some of the residents to comply with the day and time when they can dump their garbage at the movable container. Mr. Dingwan, resides at the junkshop near the container.

Date: June 8, 1998 *Weather: Fair and humid*

1) The streets are much cleaner compared to previous visits. No bags or piles of garbage were observed along the street. The residents seem to be comfortable with their collection schedule. Peace and order, however, remains to be a problem. While passing along Kalayaan B, there were residents fighting and throwing stones at each other.
2) The primary collectors were not interviewed. It was past collection time. The push carts were parked in front of the barangay's office.
3) The two doors of the big movable container along IBP road were still not in place. The lock and doors of the small container were accounted for.
4) There was garbage in front of the container. The reason is that the doors of the container are still missing and garbage is dumped any time of the day. The contractor's big truck was collecting trash at time of monitoring. The primary collectors were advised to also clean the floor and the surroundings of the container after their collection.

Date: June 10 (Conversation with the Barangay Captain)

Capt. Laxina reported during our telephone conversation that he was able to apprehend those who had stolen the container doors. He said that he has already assigned a person to monitor the container for a fee of P200.00. The missing doors were reinstalled yesterday; but broke down today and will be repaired the next day.

Date: July 10, 1998

1) Monitored the status of the primary collectors.

Primary Collector	Assignment	Trips Made	Ave. Amt. Rec'd/Day
- Benedicto Panganiban	Kalayaan B	2 trips	P60.00
- Robert Bautista			
- Jose Olado	Kalayaan C	2 trips	P30.00
- Freddie Erasga			

2) The primary collectors expressed their concern about the worn out tires of their pushcarts. They requested that they be provided with gloves and boots, since one of them (Jose Olado) suffered a cut in this hand already. The boots will be used during rainy days especially in Kalayaan C which easily gets flooded.
3) Jose Olado, a primary collector, painted his pushcart to prevent it from rusting. Others painted their assigned pushcarts but only on certain portions.
4) The doors of the big movable container were still missing.
5) According to Gloria Remetillo, a resident of Kalayaan B, she was happy with the performance and attitude of the primary collectors. Now they are used to giving out a small amount of money to them.

Date: July 31, 1998 *Weather: Cloudy*

1) Status report on the primary collectors is as follows:

Primary Collector	Assignment	Trips Made	Ave. Amt. Received.
- Freddie Irasga	Kalayaan B	4	P60.00
- Rene dela Rosa	Kalayaan A	5	
	Katuparan Ext. Kagitingan		
- Jose Olado			

2) The primary collectors concluded their route at 12:30 p.m. It was observed that they were not wearing their ID's. Also, they were not using their shovels and bells for fear that these will be taken by thieves. They reported that they receive their salary on time.
3) The small movable container is intact. One of the two doors of the big movable container is missing. However, according to Dr. Gamboa and Capt. Laxina (throught telephone conversation at the barangay office, 12:00 noon, July 13), they will have it fixed the following day. A request was made to have the door fixed before the arrival of Mr. Kusunoki, the JICA study team member.
4) Dr. Gamboa also mentioned that he has a direct hand in monitoring the project; the feedback from residents was more or less confirmed positive. Dr. Gamboa inquired if they could request for additional pushcart. I relayed to him my observation that the garbage along IBP road (movable container) are piling up because of the missing door. He said the reason for this is that there are times the assigned contractor picks the garbage at a later time.

5) Jose Dingwan has been deputized and carries a barangay ID to safeguard the containers and warn the residents from other areas not to throw their garbage in

said containers.

Evaluation/Recommendation for Kalayaan B&C Pilot Project

In general, the collection improvement system of Mr. Kusunoki, JICA study team member, is a success in Bgy. Batasan Hills, Kalayaan A, B, C,. This project is being supported by the majority of the residents through financial contributions.

It is recommended that the LGU should monitor the JICA project so that they could evaluate for themselves the benefits obtained from the project and present a similar project to nearby barangays. By using LGU resources it is felt that a positive response will also be obtained.

Barangay Bayan-bayanan, Malabon

Date: April 20, 1998 *Time: 11:00 a.m.*

1) There is waste under the houses resulting in foul odor. Garbage is also scattered along the sidewalk of Gen. Luna.
2) A partition wall between the fishpond of Celia 1 and Katipunan St. was constructed by the local government.
3) The collection bay area is flooded. The barangay chairman has suggested to elevate the collection bay to above 3 feet.
4) Ms. Bihasa of Celia 1 St. was interviewed. She stated that she favors the new collection system and provides support by using plastic bags for her household waste. She also gives P2.00 to P3.00 to the primary collector per collection trip. It was also mentioned that there is a general cleaning in the area every Saturday.
5) Mr. Leopoldo Aragon, a primary collector, is not wearing an ID and has no gloves on. He does seven trips a day and receives P70.00 daily. Mr. Aragon reported that the residents were very cooperative.
6) The barangay chairman was having difficulty in collecting garbage fees from residents. From the P950.00 that was collected, he gave a partial payment of P450.00 to Mr. Padwa and P550 to Mr. Aragon, Jr. The balance will be paid next month.

Date: April 27, 1998 *Time: 10:30 a.m.*

1) One of the movable collection bays has been pulled out and construction of a base for it as protection against flooding is ongoing. The cost (P1,500 - P2,000) will be shouldered by the barangay chairman out of his own money.
2) Ms. Arlene Mendillion of Katipunan St. was interviewed. She noted that the primary collector starts work at 5:00 a.m. Usually, she gives the collector in her area a cup of coffee, aside from her tip of P2.00 to P3.00. Overall, she is satisfied with the new collection system.
3) Mr. Ernesto Padwa, a primary collector assigned at Liwayway St., was also interviewed. He makes two trips a day and receives P40.00 a week from around 400 households in his area of responsibility. He was not in complete uniform.

Date: May 18, 1998 *Time: 10:30 a.m.*

1) The construction of a base for the collection bay has not been completed. The barangay chairman promised to have it finished within next week.
2) The fishpond area at Celia 1 is full of garbage despite the presence of the partition wall constructed by the local government.
3) In an interview with Mr. Leopoldo Jr, he stated that he receives P40.00 per day for his collection work, making five trips per day.

Date: June 5, 1998 *Time: 9:30 a.m.*

1) The collection bay without base is full of waste. The barangay chairman has requested the local government's collection office by phone to collect all the garbage at the collection point. Meanwhile, the collection bay with a fixed base has already been installed.
2) It has been observed that E. Rodriguez St. is clean.

Date: July 10, 1998 *Time: 10:30 a.m.*

1) According to the barangay chairman, the collection bay will be closed anytime soon because Meralco will use the space. The collection bay is planned to be transferred to a sidewalk in Gen. Luna fronting the barangay hall.
2) LGU collection will be from 7:00 p.m. until 9:00 p.m.
3) The primary collector will be collecting the waste in the morning; the pushcarts with collected waste will be at Celia 2 St.

Date: July 31, 1998 *Time: 10:30 a.m.*

1) The disposal of waste in the morning and afternoon at the collection bay will not be allowed.
2) Primary collectors are satisfied with the payment they are receiving from the residents.
3) LGU collection will be from 7:00 p.m. to 9:00 p.m.
4) No primary collectors were interviewed since it was already past collection time. The loaded pushcarts were parked at Celia 2 St.
5) The cleanliness of the streets is much improved compared to previous visit. No bags of garbage along the street.
6) The barangay chairman is still looking for a site for the collection bay.

Evaluation of Bgy. Bayan-bayanan Pilot Project

The LGU seems incapable of sustaining a regular daily collection in the pilot area. A flexible and a more realistic schedule should hence be worked out calling for a review its present collection system to maximize the use of collection trucks and efficient servicing of all collection routes.

If an alternate collection point is identified, the use of a movable/mobile collection bay rather than a fixed one would be more practical to adopt. A modified schedule needs to be established again by the primary collector and LGU collection truck (i.e. every other day) with the household.

The collection point or temporary holding area should be manned by barangay personnel until such time that orderly dumping and a regular habit based on committed scheduled have been attained. If needed, the collection point or the mobile container should be placed within a guarding distance of the barangay.

Complementary campaign for waste reduction and segregation should be built in every collection improvement schemes supported by proper local legislation and enforced with a strong political will.

(c) Monitoring Survey by JICA (August-September, 1998)

The JICA Study Team conducted a second monitoring survey of the pilot project areas from mid-August to mid-September. It was found that the pilot project was progressing alright, but that there were minor problems in each project area. The causes of these problems were investigated and countermeasures were taken in the monitoring stage. Table 1-6 summarizes these issues/problems and countermeasures while a brief discussion follows.

Barangay 182, Manila City

Collection bays could neither be constructed nor installed anywhere in Bgy 193 because the residents were against the idea. The collection system, therefore, that has been adopted in Bgy. 182 required the designation of primary collectors to collect waste by means of pushcarts, transport the waste and unload them at three collection points; then a collection vehicle comes and hauls the garbage away. Problems arose when the private garbage contractor failed to follow the scheduled collection time resulting in piles of garbage remaining for long time at the collection points. Residents living near the collection points began to complain, and after sometime, disallowed piling of garbage at the collection points. When this happened, the waste that had been collected by primary collectors will remained in the pushcarts until an ordinary collection vehicle came, which subsequently reduced collection work to only one trip a day. There had been times when a collection vehicle did not come, thus, collection work stopped. As a result, the residents again started to discharge their waste in the esteros.

In order to prevent a repeat of this kind of situation, the following countermeasures had been instituted ;

- If the collection vehicle does not come or arrives too late at the barangay, the barangay chairman has to inform the DPS in Manila City Hall without delay; then DPS issues a warning to the private contractor to collect the waste immediately.
- To the newly elected mayor, an explanation of the purpose and requirement of the understanding and cooperation for the pilot project was made.

The key point of success in Barangay 182 is the establishment of a smooth linkage between the regular collection service and the proposed primary collection service, whereby there is precise coordination of private contractor by local government and primary collection service is supervised by the community. It then becomes a workable system that can be applied in areas where no collection bay can be

constructed or installed., such as the case in Barangay 182.

Kalayaan, Quezon City

The pilot project in Kalayaan is the most successful among the three pilot areas because of the following factors: (i) cooperation among the residents, (2) the efficient collection work of primary collectors, (iii) the follow-up system set up by the barangay; and (iv) the strong linkage between work by private contractor and by primary collectors. However, there are some maintenance problems, such as worn-out wheels of pushcarts and damaged doors of the collection bays which the Study Team has agreed to have repaired in order to sustain the project and enable it to become a model to similar inaccessible areas in Metro Manila.

Due to the damaged door of the movable collection bay, waste stored inside the bay can be seen from the outside, and residents discharge their waste just around the bay's area. Consequently, the residents living near the bay complain about the unsightly view and offensive odor.

Originally, three collection bays were planned to be installed at three different locations based on the amount of discharged waste in the area. But because of the complaints of residents, it was reduced to two. However, the volume of collected waste exceeded the capacity of the existing collection bays resulting in waste overflow around the collection bay. It has been decided, therefore, to install the third collection bay at the site of one of the existing bays in order to increase its capacity.

Barangay Bayan-bayanan, Malabon

Two movable collection bays were installed with permission at a privately-owned land located near Bgy. Bayan-bayanan because there was no suitable space for collection bay installation within the area. However, it has been observed that the collection bays become unusable during the rainy season because the area is always flooded. Consequently, the primary collectors are forced to leave the collected waste in the pushcart until a collection vehicle comes; collection work is reduced to one trip a day. The residents again start to discharge their waste to nearby esteros and/or under the houses.

In order to solve this problem, it was agreed among Malabon Municipality, Barangay Bayan-bayanan and the Study Team to modify the size and structure of the collection bays, transfer them to another location and construct a sidewalk along the main street.

Wages for primary collectors are shouldered by the barangay budget and by voluntary payment from residents.

Table 1-6 Issues/Problems and Countermeasures

Issue/Problem	Area	Issue/Problem	Countermeasure	Present Situation
Installation of Collection Bay	BGY.182 (Manila)	Nearby residents did not accept installation.	No collection bay installed, residents / officials identified 3 collection points	Because of irregular collection schedule by contractor, the collected waste by primary collectors is kept until collection truck comes. ⇒Complain to City Hall of Manila by the barangay and offer to have a meeting with the newly-elected mayor.
	Kalayaan (Quezon)	Installation of permanent structure was disapproved by residents nearby.	Only one permanent structure was installed outside residential area, 2 units of movable type installed	Nearby residents of movable type collection bays complain about overflowing waste from bays. ⇒Repair of door and installation to extra collection bay.
	Bayan-bayanaan (Malabon)	Site is a private property. Also, no site is available within the barangay.	Secured permit to use from concerned LGU official.	Unused collection bay because of flooding ⇒Transfer of collection bay to sidewalk; remodeling of collection bay to small size and closed type
Collection Service Fee	BGY.182 (Manila)	Residents did not accept mandatory fee. LGU-City Hall did not approve inclusion of voluntary fee	Basic allowance is P500 from Barangay. Fee was made voluntary. Issue not forced because residents approved anyway.	Primary collectors receive P500 allowance from barangay constantly, and voluntary fee from residents.
	Kalayaan (Quezon)	Residents did not accept mandatory fee.	Basic allowance is P1,000. Fee was made voluntary.	Primary collectors receive P1,000 allowance from the barangay constantly, and voluntary fee from residents.
	Bayan-bayanaan (Malabon)	Residents could not agree on "how much to give"	Proposed P10 per month per household was approved to be collected by Bgy. office.	Barangay employed only two collectors. The collectors receive P2,000 allowance from Barangay regularly, and voluntary fee from residents. Other 3 collectors receive only voluntary fee from residents.

Regular Collection	BGY.182 (Manila)	■ Frequency : daily ■ Time : 10:00 a.m. ■ Collection System : point collection	Irregular waste collection by private contractor (LEONEL) ⇒Complain to DPS in Manila City Hall by Bgy. Chairman in case collection service is not done. ⇒Offer to have a meeting with the new mayor to request support to the project
	Kalayaan (Quezon)	■ Frequency : MWF ■ Time : 10:00 a.m. ■ Collection System : point collection	Collection service is provided regularly.
	Bayan-bayanan (Malabon)	■ Frequency : daily ■ Time : 10:00 a.m. ■ Collection System : point collection	Collection time is changed to nighttime because of lack of the operational vehicles. ⇒Request municipality to change original collection schedule.
Equipment	BGY.182 (Manila)	■ Collection bay: no installation ■ Pushcart: 5 units	Well maintained
	Kalayaan (Quezon)	■ Collection Bay: fixed type : 1 unit movable type : 2 units ■ Pushcart: 5units	Damage to doors⇒Need to be repaired. Lack of capacity of collection bay⇒transfer of spare bay stored in Quezon City to project site Need for spare tires
	Bayan-bayanan (Malabon)	■ Collection Bay: movable type : 2 units ■ Pushcart: 5units	Unused collection bay because of flooding ⇒Transfer of collection bay to sidewalk; remodeling of collection bay to small size and closed type Well maintained

1.10 Finding

Generally, it was verified that the proposed primary collection system by pushcart is an effective system, especially in inaccessible areas. In case of introduction of the primary collection system to inaccessible areas, however, it is necessary to note the following points :

(1) The action plan based on the willingness and opinions of residents;
(2) Selection of place to install a communal storage and approval of the residents living near the communal storage;
(3) Structure of facility for communal storage;
(4) Combined system of regular collection service provided by Local Government (private contractor) and primary collection which will be done by the people living in the area;
(5) Collection service fee (salary/allowance for primary collectors);
(6) Establishment of financial resource mechanism;
(7) Agreement among residents, especially those living in the vicinity of the communal storage, barangay (community), local government, (private contractor), regarding the proposed collection system;
(8) Willingness of residents to clean up their own area; and
(9) Responsible sector to extend the collection system to other inaccessible areas in Metro Manila.

An explanation of each point mentioned above is given hereafter.

(1) The action plan based on the willingness and opinions of residents
A bottom-up approach in community-based planning such as workshop method (focused group discussion)

A workshop is an effective way to formulate an action plan and consider the following points:
- to make clear directly the issues and problems regarding residents' generated garbage;
- to provide a venue for residents to come up with solutions which they consider suited in their area; and
- to make residents appreciate the necessity for appropriate collection system in their own areas.

Hence, an action plan proposed in inaccessible areas is easy to be approved by residents because the system is their own.

(2) Selection of place to install a communal storage and approval for the residents nearby

After approval of the action plan by the barangay, it may happen that residents living near a proposed communal storage will refuse to have a communal storage nearby, as in the case of the project areas. The following countermeasures were taken;

(a) Street meeting with residents who live near the proposed communal storage was held to make them understand and get their cooperation (Barangay 182, Tondo, Manila City)

(b) Modification of collection bay structure (Kalayaan Barangay Batasan Hill, Quezon City)
- Installation of movable type collection bays; and
- Attachment of roof and wall with GI sheet to the collection bay structure to avoid odor and irregular discharge. This way the surrounding area is kept beautiful.

(c) Discussion with chairman of the barangay where the collection bay will be located (Barangay Bayan-bayanan, Malabon Municipality)

There was no suitable space for collection bay installation within the project area. An available space was privately owned and located outside the project area, but nearby. Approval was given and the collection bay was installed along Gen. Luna Street. The area, however, became inaccessible when the rainy season came. The collection bays were transferred to another location after modifications were made in their size and structure.

The size and structure of the communal storage should conform to the condition of the selected location, and to the agreement made with residents.

(3) Structure of facility for communal storage

Before starting the pilot project, the installation of a communal container was doubted as an appropriate facility for the collection system based on previous projects. In those previous projects, the installed communal containers ended up as disposal sites because of various reasons.

Hence, a collection bay, i.e. a momentary discharge point which has a structure that considers the situation of a community and area condition, and also has a management system, was proposed instead of a communal container. However, even with the collection bay, it was very difficult to get approval on installation from residents living near installation points.

It might be easy to establish a collection system without any collection facility in accessible areas. In this case, a primary collector collects waste only once and then waits until a collection vehicle comes. But then during this time, the pushcarts are loaded with waste and collection work cannot continue. Also, the system needs regular collection time of collection vehicle in order to work.

Installation of collection bay is recommend for collection system in inaccessible areas. The following should be considered in case of installation:

- secure the installation place(s) and get understanding/approval of residents for installation;

- ensure maintenance by primary collectors and supervision by barangay;
- investment for installation; and
- cost for maintenance.

(4) Combined system of regular collection service provided by local government (private contractor) and primary collection which will be done by the people living in the area

Even if an appropriate collection system in accessible area is already in place, if ordinary collection time is not provided regularly, the primary collection system cannot function. During implementation stage of the pilot project in Barangay 182, Manila City, the delay in collection caused by the non-compliance of the private contractor resulted in uncollected waste piled up in pushcarts, and this sight affected the surrounding area. As a minimum requirement, in order to establish a reliable primary collection system, regular collection should be provided by local government/private contractor.

(5) Collection service fee (salary/allowance for primary collectors)

A collection service fee is a very sensitive and essential issue for the primary collection system in accessible areas. Specially, since residents who live in those areas belong to the low income level.

In the pilot project, JICA-MMDA left the issue of a collection service fee to the decision of each barangay. It was verified that payment of salary/allowance to primary collectors came from the residents under barangay management:

Barangay 182: Basic allowance of collectors is P500.00 from barangay budget which was the amount previously paid to street sweeper. Plus voluntary payment from residents.

Kalayaan : Basic allowance of collectors is P1000.00 which is newly established from barangay budget. Plus voluntary payment from residents.

Barangay Bayan-bayanaan: P10.00 per month per household.

(6) Establishment of financial resource mechanism

In order to sustain the any proposed and on-going projects, it is necessary to establish a financial resource mechanism. The following may be considered:

- local government subsidy
- barangay budget
- collection fee inclusion in tax.
- package deal contract system with private company
- combination of above sources

(7) Agreement among residents, residents nearby communal storage, barangay (community), Local Government, (private contractor), regarding proposed collection system

To insure a reliable and regular collection system to the residents, an agreement should be drawn up among residents, esp. those living near the communal storage, barangay (community), local government, (private contractor).

(8) Willingness of residents to clean up their own area

A workshop and " Clean-up Day" held during the pilot project created an incentive and motivation for cleanliness in the community.

(9) Responsible sector to extend the collection system to other inaccessible areas in Metro Manila

JICA Study Team conducted an opinion survey to responsible officials regarding waste collection service in inaccessible areas. The results of the survey showed that all of the LGUs in Metro Manila considered that collection service is necessary in inaccessible areas. Many LGUs make an effort to cover those areas, but owing to physical limitation such as area condition, such as narrow interior streets and type of collection vehicles, it is difficult to do so using the present waste collection system. Six LGUs' contract for waste collection with private companies indicated that collection service in inaccessible areas is included. As to the question on who should be responsible for the collection system to other inaccessible areas, majority answered LGU (10), next was barangay (8), residents (2), and private contractor (2). Asked regarding appropriate collection system to be provided in inaccessible areas, pushcart and collection points were key words from their answer.

For implementation of the pilot project, it verified that the roles of both LGU and barangay are very important and essential.