

COMMUNITY-BASED ECOLOGICAL SOLID WASTE MANAGEMENT PROGRAMME IN THE PHILIPPINES (CBESWMP)

-Final Project Review and Evaluation Report-

Acknowledgement

Authorship of this evaluation report belongs to the stakeholders who tirelessly responded to the surveys conducted by the consultant. My role was simply to put their inputs and thoughts into one coherent report. The respondents made a thorough evaluation of the performance of the project including their own performance in the implementation of the project. The level of effort they put up in this evaluation study is a good indication of their resolve to help make CBESWMP work.

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I would like to end this acknowledgement by believing that **“The business of CBESWMP is making it the peoples’ business”**.

Candido A. Cabrido, Jr.
Consultant
11-15-06

Acronyms

List of Acronyms

CBESWMPP	- Community-Based Ecological Solid Waste Management Project
COA	- Commission on Audit
DENR	- Department of Environment and Natural Resources
EMB	- Environmental Management Bureau
ESWM	- Ecological Solid Waste Management
ESWMD	- Ecological Solid Waste Management Department
IEC	- Information, Education and Communications
FPRE	- Final Project Review and Evaluation
HH	- Household
LGU	- Local Government Unit
M&E	- Monitoring and Evaluation
MMDA	- Metropolitan Manila Development Authority
MOA	- Memorandum of Agreement
MRF	- Materials Recovery Facility
MSMO	- Metropolitan Sanitation Management Office
NGO	- Non-Government Organization
NSWMCS	- National Solid Waste Management Commission Secretariat
PMO	- Project Management Office
PNR	- Philippine National Railways
SWM	- Solid Waste Management
SWMO	- Solid Waste Management Office
UNDP	- United Nations Development Programme

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EXECUTIVE SUMMARY

Brief Project Background

The Community-Based Ecological Solid Waste Management Programme (CBESWMP) is funded by UNDP and implemented by MMDA from January 2002 to 2005 and by the NSWMCS from January until December 2006 for its extension phase. The project aims to establish a community-based ecological solid waste management system in pilot barangays, which can serve as models for replication in other barangays; and to develop the capability of barangay LGUs to implement RA 9003.

In accord with its objectives, the project has three major components, namely: 1) setting up the CBESWMP system, 2) building up the capabilities of barangay implementers, and 3) developing the enabling tools for policy development from which a model shall evolve to guide replication in other LGUs.

Final Project Review and Evaluation (FPRE) Study

This report presents the results and findings of the Final Project Review and Evaluation (FPRE) study. The FPRE study reviewed and **evaluated the performance of the CBESWMP project** in terms of its level of effectiveness, efficiency in the delivery of outputs, benefits and impacts generated, and sustainability potential so that its design and implementation can further be improved when it is replicated in other barangays.

The evaluation study covered all the 11 pilot barangays, the 10 solid waste management offices of the City/Municipal LGUs, the implementing agencies – MMDA, NSWMCS and their PMOs, and the UNDP Program Officers for the project.

Pilot barangays and their LGUs which are included in the evaluation study are:

- 1) Sto. Nino, Paranaque City
- 2) Barangay 598, Manila City
- 3) Barangay 52, Caloocan City
- 4) Barangay 56, Caloocan City
- 5) Barangay VASRA, Quezon City
- 6) Barangay Niugan, Malabon City
- 7) Barangay Pilar, Las Pinas City
- 8) Barangay Rosario, Pasig City
- 9) Barangay Tanza, Navotas Municipality
- 10) Barangay COMEMBO, Makati City
- 11) Barangay Tunasan, Muntinlupa City

The **triangulation method** was employed in the evaluation study, wherein the data used for analysis were derived from three sources: secondary data from project documents, the survey data on perception and information from interviews and focus group discussions involving the stakeholders from the pilot barangays and City/Municipality solid waste management officers, and the survey data provided by respondents from implementing agencies to include MMDA, NSWMCS, PMO and UNDP. The data and information collected from the three sources were checked for their consistency and accuracy.

The **participatory approach** was adopted wherein the stakeholders were directly involved in the rating of the performance of the project using the criteria prescribed in the TOR of the study. The parameters used in evaluating the performance of the project were evaluated by the stakeholders using a scale of 1 to 10 with 10 as the highest.

Performance Evaluation Results and Findings

Based on the **prescribed criteria** for evaluating the performance of the project, the main findings of the study are briefly described below.

Objectives of the Project

Overall, the objectives of the project were attained. Even surpassed was the objective on increasing recycling level to 10% by 2010 in which the **pilot barangays** were able to **attain an average of 42% waste diversion rate**. However, the objective on the institutionalization of instruments (tools and models) and appropriate implementation mechanisms relevant to SWM was initially limited to the establishment of the M&E system but later on the documentation of best practices or emerging CBESWMP model was also accomplished. Guidebooks on CBESWMP were published towards the closing month of the project.

Compliance to RA 9003 and the Project's MOA

The project was **instrumental in helping the pilot barangays comply with the key provisions of RA 9003** such as the preparation of SWM plan, waste segregation and recycling, MRF establishment and the prohibition of dumping and burning of wastes.

All the barangays complied with the provisions of the MOA in relation to MRF establishment except for three barangays (52, 56 and 598) which were not able to find suitable sites for its construction.

Relevance of the Project to the Needs of the LGUs

Majority of the pilot barangays gave a very high rating to the relevance of the project in meeting their mandate on ESWM. Both MMDA and NSWMCS were given high marks for providing active support in the implementation of the project. In particular, the core group formed by the project and the NGOs were very helpful in implementing the project's information and education activities.

Efficiency of Project Implementation

Despite the lack of time and few remaining funds, the **project's PMO was able to accomplish its major deliverables**. Most of the project's outputs were noted by the respondents to have been delivered on time except the **construction of MRF, which was greatly delayed due to inevitable circumstances**.

The top management of MMDA reportedly terminated the project in December 2005 upon being convinced that it had already served its purpose. Six months prior to its termination, the project entered a lull period and became less active. During this dormancy period, some of the barangays stopped their project activities including MRF operations due to miscommunication between them and the PMO.

Effectiveness of Project Implementation

Majority of the respondents gave high rating to the effectiveness of the project's outputs which include training, IEC, and community organizing. They **find these outputs very effective in making their ESWM efforts successful**. However, the project's efforts on waste segregation, site selection for MRF and MRF construction were found to be less effective.

Cost effectiveness of the project was highest in barangays Sto. Nino, 598, 52 and 56. This means that project investments were the lowest in these barangays and yet they produced the highest effects in terms of changing the residents' behavior on segregation. It should, however, be mentioned that barangays 52, 56 and 598 did not receive investments on MRF thereby lowering their project cost resulting in higher cost effectiveness. The other barangays with moderate level of cost effectiveness are: Rosario (P707/HH), VASRA (P841/HH) and Niugan (P863/HH). COMEMBO's improvement in compliance rate to segregation was nil because even before the project was implemented it had already a very high compliance rate of 98%. Thus, it was not cost effective for the project to invest in COMEMBO. Even without the project, the barangay can do well on its own of maintaining a high level of segregation rate.

Project Benefits and Impacts

Several **benefits and impacts were brought about by the project** and its components to the stakeholders particularly the LGUs and the communities. These include:

- 1) employment and income to ecoaides, street sweepers, SWM enforcers, pushcart vendors, junkshop workers from the sale of recyclables;
- 2) improved cleanliness of environment and minimized hazards to health;
- 3) minimized if not eradicated dumping of wastes on the sidewalks, streets and vacant lots (including hanging of garbage bags on fences, trees and lamp posts);
- 4) minimized odor and spread of vermins (rats, flies and cockroaches);
- 5) improved discipline among households (segregation);
- 6) improved cooperation among households in proper disposal of wastes;
- 7) reduced the volume of wastes collected by garbage trucks and the volume disposed in dumpsites/landfills extending the life span of dumpsites and sanitary landfills);
- 8) reduced the number of trips of dump trucks resulting in savings by LGU on garbage collection;
- 9) proper sorting and storage of recyclables made possible by MRFs; and
- 10) capacitated barangay LGUs on ESWM through training, IEC, planning and provisions of equipment and facility (pushcarts, ecotrikes, MRF, composter, computer, weighing scale, etc.).

Sustainability Potentials of the Project Initiatives

Sustainability of the CBESWMP project in pilot barangays is tacitly ensured due to several **driving factors**:

- 1) political factors - compliance with the law and fear of being penalized,
- 2) economic factors - income from MRF and incentive payment for waste diversion from City LGU,
- 3) environmental and social factors - clean environment, free from vectors of diseases, and contented residents,
- 4) institutional factors - barangay has the capability or know how and basic facility for ESWM, and
- 5) ethical factors - doing what is good for the residents, fulfilling what is expected of barangay officials and fulfilling good governance system).

All the pilot barangays are confident that they can sustain the initiatives of the project. The City/Municipal LGUs through their SWMOs also affirmed their commitment to continually provide support the CBESWMP efforts of the pilot barangays.

Project Ownership and Stakeholders' Participation

Project ownership is evidently shown by the strong cooperation and active participation of the stakeholders such as barangay officials, NGOs, community organizations, and local residents. The barangay implementers fully acknowledged the support of the NGOs and many households in the implementation of the project's activities.

Replicability of the Project

All the barangay respondents and the City/Municipal SWMOs **expressed their confidence that the CBESWMP will not pose much difficulty to replicate in other barangays**. Most of the City/Municipal SWMOs are ready and capable to replicate CBESWMP training, IEC and MRF establishment in other barangays.

Applicability and Usefulness of the Project's M&E System and IEC

Most of the pilot barangays find the **M&E system developed by the project to be useful in tracking down the volume of recyclable materials**. They also find the M&E forms relatively easy to fill-out.

Two of the IEC materials produced by the project got good feedback and high rating from the barangay respondents. They find the RA 9003 poster and the door-to-door flyers to be effective in informing and educating target audiences. The Basura Kid comics has a strong appeal to school children and a popular material with high demand from the general public.

Conclusions and Recommendations

The CBESWMP helped improved the compliance of pilot barangays to RA 9003. **The objectives of the projects were satisfactorily met**. Despite management set-backs and daunting tasks, the PMO was able to accomplish all its major deliverables.

Several benefits and impacts were generated by the project and contributed to the cleanliness and sanitation of the pilot localities and improved the capacity of barangay LGUs to sustain CBESWMP initiatives.

The CBESWMP system established under the project has a high potential for replication in other barangays because its implementation involves pragmatic ways and modest amount of investments from the City/Municipal and Barangay LGUs. **The pilot barangays are quite confident that they can easily sustain the CBESWMP system and its project components** and activities such as information campaign, training, MRF operations, and monitoring inasmuch as they have developed the capacity to do so.

Low compliance to waste segregation by local residents remains the bottleneck of the CBESWMP. This remains a challenge to the barangay and City/Municipal LGUs.

The construction of MRF buildings is a precursor to improving collection of recyclables and increasing waste diversion rate. However, there are other equally functional alternatives to MRF buildings such as mobile MRFs, use of junkshops as MRFs, and ecocenters in unutilized or vacant spaces in schools.

The evaluation study also made several recommendations to improve the design and implementation of the CBESWMP projects in preparation for its replication in other barangays.

1.0 BRIEF BACKGROUND

The Project contract was signed by UNDP and GOP represented by NEDA and MMDA in January 2002. The project was programmed to run for 36 months (January 2002 – 2004) with a total budget of US\$610,950 inclusive of the 39% counterpart from GOP's MMDA and LGUs. The project was not completed on the expected date and was extended to December 31, 2005 under the MMDA. It was further extended under the helm of NSWMCS to finish all pending deliverables and will be completed by the end of 2006.

The project's central theme is **community-based ecological solid waste management** which intends to provide catalytic support to the take-off of RA 9003 or the Ecological Solid Waste Management Act in Metro Manila by developing and showcasing the complete cycle of solid waste management from generation, collection, storage, recycling and disposal with the active participation of stakeholders at the level of the Barangay, City/Municipal LGU and national government agencies. However, the project does not aim to be responsible for the direct implementation of RA 9003.

Three **immediate development objectives** of the project were set out as follows:

- 1) to increase the capabilities of LGUs on community-based ecological solid waste management. The project aims to increase the LGUs ability to manage solid waste through the project's learning by doing approach, and through its assistance in increasing the capability of LGUs to implement RA 9003;
- 2) to set up catalytic community-based waste recycling systems in selected sites in the LGUs identified/selected for the project; and
- 3) to evolve institutionalization instruments like tools and models and appropriate implementation mechanisms relevant to solid waste at the community level and to the implementation of RA 9003.

Corollary to its development objectives, the **targeted outcomes** of the project are:

- 1) to contribute to meeting the target of increasing recycling level from 4% at the household level to at least 10% by the year 2010;
- 2) to develop a community-based ecological waste management system which can be adopted by LGUs with strong support from NGOs and POs; and
- 3) to attain an expanded capacity for communities and the country eventually, to achieve and implement a community-based ecological solid waste management system.

The original project design has **three components**: 1) setting up the CBESWMP system, 2) building the capabilities of barangay implementers, and 3) developing the enabling tools for policy development from which a model shall evolve to guide replication in other LGUs.

After going through the maze of deliverables that the project document tries to define, one can simply deduce that the **project aims to achieve three key results** to establish a sustainable solid waste management system in the pilot barangays: 1) change the behavior of households to support segregation through a well-thought and executed IEC as part of its social preparation and social mobilization package; 2) guide, train and support the barangays in establishing the enabling systems and provide equipment/facilities (MRF) to support recycling of wastes and reducing the volume disposed in

dumpsites; and 3) develop situational-adapted prototype CBESWMP models for replication in other barangays.

The project was under the execution of MMDA from 2002 to 2005, being the agency mandated to manage proper solid waste disposal in Metro Manila. In August of 2004, the management of the project was transferred from MMDA's Solid Waste Management Office (SWMO) to the Metropolitan Sanitation Management Office (MSMO) to provide more impetus to cleanliness and sanitation and for other undisclosed reasons.

Under MMDA's administration, the focus of the project was the implementation of intensive information drive to support the door-to-door scheme of garbage collection within the context of the community-based ecological solid waste management approach. MMDA's top management believes that the key to the success of solid waste management is the efficient collection, recycling and proper disposal of wastes.

After several turn of events, the management of the project was transferred to NSWMCS-DENR in January 2006 when MMDA decided not to extend the life of the project despite pending important deliverables. Under the aegis of NSWMCS, the project was initially extended by UNDP until July 2006 to finish pending project components and activities. But due to delays in the production of IEC materials and the fabrication of two mobile MRFs, which are two of the major deliverables of the project, the project completion deadline was reset to the end of 2006.

The **main purpose of this Final Project Review and Evaluation (FPRE)** is to examine the performance of the CBESWMP project in terms of the level of its effectiveness, efficiency, benefits and impacts, and sustainability potentials so that the replication of the project in other barangays can draw out lessons from its experiences.

2.0 SCOPE AND OBJECTIVES OF THE FPRE

The evaluation study covered all the 11 pilot barangays, the 10 solid waste management offices of the City/Municipal LGUs, the implementing agencies – MMDA, NSWMCS and PMO, and the UNDP Program Officers for this project.

Pilot barangays and their LGUs included in the evaluation study are:

- 1) Sto. Nino, Paranaque City
- 2) Barangay 598, Manila City
- 3) Barangay 52, Caloocan City
- 4) Barangay 56, Caloocan City
- 5) Barangay VASRA, Quezon City
- 6) Barangay Niugan, Malabon City
- 7) Barangay Pilar, Las Pinas City
- 8) Barangay Rosario, Pasig City
- 9) Barangay Tanza, Navotas Municipality
- 10) Barangay COMEMBO, Makati City
- 11) Barangay Tunasan, Muntinlupa City

The **objectives of the FPRE** are:

- 1) to assess the project's performance and achievements vis-à-vis the project's overall objectives and its impact on the various stakeholders especially community beneficiaries;

- 2) to generate lessons learned from the implementation of the project's activities and the outcomes achieved that will be useful for similar projects in the future for the same sector; and
- 3) to develop specific recommendations for major stakeholder groups anchored on the conclusions the different stakeholder groups will develop based on their own recommendations and insights.

The FPRE examined the performance of the project in terms of the successful implementation of its project components as follows:

- 1) Setting up the CBESWMP system, which is mainly comprised of: a) selection of sites based on commitment, provision of counterpart budget, availability of SWM plan and other criteria listed below, b) community organizing and planning, c) infrastructure support – MRF construction, composting sites, d) institutional arrangements, which included a) core group formation, b) collection system, and c) M&E system.
- 2) Capability building consisting of a) community planning, b) IEC design, production and dissemination, c) study tours and exchange visits, and d) learning by doing.
- 3) Developing the enabling tools for policy implementation, which primarily involved: a) the institutionalization of CBESWMP, and b) replication models based on best practices.

3.0 APPROACH AND METHODS

3.1 Approach and Method Adopted in the FPRE

The evaluation study employed the **triangulation method** wherein the data and information collected are checked for their consistency and accuracy against three sources: secondary data in the form of project documents, the survey data on perception and information provided by the respondents from pilot barangays and City/Municipality solid waste management officers, and the survey data provided by respondents from implementing agencies to include MMDA, NSWMCS, PMO and UNDP. Complemented by his field observations, the primary and secondary data and information gathered were analyzed by the Consultant.

The review and evaluation study adopted the **participatory approach** wherein the stakeholders were directly involved in the rating of the performance of the project using the criteria prescribed in the TOR of the study. The following steps were undertaken in the evaluation process:

- 1) Review of project documents to examine project issues, problems and accomplishments vis-à-vis objective and target outcomes of the project. The project documents reviewed include: contracts and agreements between UNDP and MMDA and NSWMCS, project reports, project fact sheets, IEC materials (printed and AV materials), signed copy of MOA between barangays and PMO, and implementing rules and regulations of IRR.
- 2) Preparation of evaluation instrument in the form of survey questionnaire. The questionnaire was designed to generate responses that address the criteria for evaluation. Four types of questionnaires were prepared and administered to key respondents from barangay LGUs, SWMO of City/Municipality LGUs, implementing agencies: MMDA, NSWMCS and UNDP-PMO, and UNDP.

- 3) The survey questionnaires were reviewed and commented by PMO and NSWMCs staff and were revised accordingly. The revised survey questionnaires were then tested in one barangay LGU and one SWAMO LGU and then refined for administration to all target respondents.
- 4) Interviews were conducted in Tagalog and respondents from the barangays usually included the barangay chairpersons and SWM Kagawads. In barangays wherein other barangay officials joined the interview, the approach in generating responses was shifted to a group discussion type but focusing on the questions being asked (FGD approach). In 7 of the 11 barangays surveyed, the barangay chair was present. Only the barangay chairpersons of barangays 52, 56, Rosario, and VASRA, were not available during the time of the interview. Of the 10 LGU-SWM Officers, only three were not available for the interview, namely: Manila, Muntinlupa and Malabon although they fully filled-out and submitted the questionnaire sent to them. The last batch to be interviewed included: NSWMCs top officials and staff, PMO staff, and UNDP Program Officers. The former Project Directors of MMDA were the first to be interviewed at the start of the evaluation study. The complete list of respondents is given in Annex 1.
- 5) The results of the interviews were documented for reference of the NSWMCs and UNDP in their future undertaking of similar projects.
- 6) The Project Evaluation Report which contains the results and findings of the evaluation study was submitted and presented to UNDP-PMO, implementing agencies, pilot barangays and LGU SWMO for information, validation and comments.

The participatory review and evaluation process adopted gave an opportunity for the PMO, NSWMCs, Barangay LGUs, and City SWM participants to exchange learning experiences, ideas and suggestions. The interview sessions and FGDs also gave the stakeholders the opportunity to **assess the project and at the same time self-evaluate their level of performance** in the implementation of the project and compliance with RA 9003. The participatory process is axiomatically a social learning process and the stakeholders have ownership of the results of the evaluation study including its recommendations.

3.2 Criteria Employed in the Evaluation of Project Performance

The participatory review and evaluation rated the performance of the project in terms of the following **criteria established by the implementing agencies**:

- 1) Compliance to RA 9003 and the project's MOA,
- 2) Relevance of the project to the needs of the LGUs,
- 3) Efficiency of project implementation,
- 4) Effectiveness of project implementation,
- 5) Project benefits and impacts,
- 6) Sustainability potentials of the project initiatives,
- 7) Project ownership and stakeholders' participation,
- 8) Replicability of the project, and
- 9) Applicability and usefulness of the project's M&E system and IEC.

3.3 Rating employed

A rating system, using a **scale of 1 to 10 with 10** as the highest score, was used in the evaluation of the project's performance in terms of the criteria adopted. **The rating for the aforementioned criteria was done by the stakeholders** who responded to the

interviews and focus-group discussions that were conducted. Depending on the criteria, either the average or the mode of the ratings was derived to draw out conclusions.

4.0 EVALUATION RESULTS AND FINDINGS

This chapter presents the summary tables that were mainly derived from the results of the stakeholders' survey. The tables show the ratings made by the respondents to the criteria that were adopted in the evaluation study. Although most of the tables provide quantitative results of evaluation, some tables are descriptive. All the tables serve as the bases for analyzing the results of the evaluation study.

4.1 Project Objectives and Design

Overall, the objectives of the project were generally attained; however, the objective on the institutionalization of instruments (tools and models) and appropriate implementation mechanisms relevant to SWM at the community level was somewhat operationally vague and difficult to evaluate. The PMO cited its IEC and M&E system accomplishments as part of this objective. However, the development and institutionalization of tools and models should appropriately be contextualized in terms of the documentation of workable and practical systems of implementing CBESWMP, which is equivalent to best practices that emerged in pilot barangays; and laying the groundwork for the adoption or replication of the LGUs of these best practices in their other barangays. Nonetheless, the PMO, under the initiatives of the NSWMCS, was able to document and print the CBESWMP guidebooks towards the closing month of the project.

The **following objectives of the project were satisfactorily met** with the first objective even surpassed:

- 1) to contribute to meeting the target of increasing recycling level from 4% at the household level to at least 10% by the year 2010; and
- 2) a developed community-based ESWM system which can be adopted by LGUs with strong support from NGOs and POs.

One deliverable mentioned in the original project document that was not accomplished is the linking-up of the CBESWMP with the Local EPM of the DENR. The planned educational tours of representatives from pilot barangays to learn from the ESWM experience of Tagbilaran, Bohol, Cagayan de Oro and Lipa City, Batangas did not materialize. Instead, the participants were brought to San Fernando, La Union, Baguio City and San Fernando, Pampanga to showcase the best practices on ESWM in these areas. In addition, the manual cum educational modules on community-based planning and management of ESWM, which is intended to guide project implementers at the start of the project, was only produced during the end of the project hence, defeating its purpose. These manuals and guidebooks can still serve their purpose when CBESWMP is replicated in other barangays. At present, the experience on CBESWMP of Tanza is currently being replicated in other barangays in Navotas.

Something must also be said about the criteria for selecting pilot project barangays, which were employed by the project's implementing agency – the MMDA. Pilot barangays were selected based on the following criteria:

- 1) willingness and commitment of Mayor and local officials and solid waste managers as expressed by their submission of the CBESWMP core group composition with at least 5 members;
- 2) number of households is between 1,000 to 1,500 only;
- 3) not a village or subdivision;

- 4) not an informal community
- 5) with available site for MRF building
- 6) not a recipient or beneficiary of any SWM-related assistance.

Three of the selection criteria are somewhat flawed namely criterion numbers 2, 3, and 4. Of the 11 pilot barangays, 7 barangays have households exceeding 1,500 (criterion no. 2), namely: 1) Barangay Rosario – 11,984, 2) Barangay Tanza – 6,422, 3) Barangay COMEMBO – 3,026, 4) Tunasan – 9,875, 5) Barangay 598 – 2,440, 6) Barangay Sto. Nino – 2,962, and 7) Barangay Pilar – 6,418. The barangays that are only partially covered by the project because of their very large population include Rosario, Tunasan, Tanza and Pilar. It appears, nowadays that even urban barangays with small land areas exceed 1,500 households.

Criteria numbers 3 and 4 may not have been strictly followed in the process of selection considering the nature of the pilot sites selected. For example, barangays Pilar and Rosario have a mix of subdivision and traditional residential areas. Likewise, most of the pilot barangays have clusters of informal settlers of varying sizes.

The conduct of future similar project in other urban barangays would require the modification of these selection criteria to attain better homogeneity of areas for CBESWMP model construction purposes. It would rather be difficult to construct prototype models for replication if the pilot areas are wide heterogeneous in character.

4.2 Project Performance based on Evaluation Criteria

The pilot barangays were evaluated in terms of their compliance to RA 9003 and the projects Memorandum of Agreement (MOA). The compliance rate of the barangays is a good indication of the project's contribution to local governance.

4.2.1 Barangay Compliance to RA 9003

The compliance of the pilot barangays to the key provisions of RA 9003 was rated by their respective respondents consisting of barangay officials (Barangay Chairperson, Kagawad for SWM and other officials). Table 1 shows the compliance rating before the project and during the project.

Before the project, six (6) barangays of the total 11 pilot barangays or 55% did not have a written SWM plan; 7 barangays (64%) were not strictly enforcing segregation and households were not into recycling of wastes; 9 barangays (82%) were not composting; 9 barangays (82%) did not have an MRF; and 8 barangays were not strictly enforcing the prohibition against dumping and burning of wastes. **In summary, the survey results show that before the project, most of the pilot barangays were not able to comply with the key provisions of RA 9003.**

During the implementation of the project, most of the barangays got the opportunity to comply with RA 9003's key provisions. Seventy three percent (73%) of the respondents gave a high rating (8 and above) of their compliance in strictly enforcing the dumping or burning of wastes; 63% gave high rating of their compliance with recycling and MRF establishment; and 45% gave high rating of their compliance with waste segregation and preparation of SWM plan (Table 1).

4.2.2 Barangay Compliance to Project MOA

The MOAs between the project and the pilot barangays were signed only during the extension phase of the project in 2006 under the NSWMCS. The MOA requires that the

latter should meet the following requirements: site for MRF, materials and facilities for MRF, personnel to supervise the MRF operations, sustain the operations of the MRF, ensure that junkshops are sanitary and orderly, and submit monthly monitoring reports on recyclables to the project.

All the barangays complied with the provisions of the MOA related to MRF, except for Barangays 52, 56 and 598, which found no suitable sites for MRF (Table 2). Of the 8 barangays compliant to MRF establishment, 5 barangays, namely: VASRA, Niugan, Tanza, COMEMBO and Tunasan did not provide materials and facilities for MRF construction. The cost of construction was entirely borne by the project.

All the barangays monitor closely and keep tab of the cleanliness and orderly of junkshops within their jurisdiction. Only barangay Rosario reported that they do not have junkshop located within the barangay. Of the 11 pilot barangays, only barangays 52, VASRA and Niugan have missed some months in the submission of monthly monitoring reports due to various reasons: computer breakdown, delayed inputs by Ecoaides, and lack of literacy in computer operations. These barangays are now trying to catch up with their backlogs.

Table 1. Barangay Compliance to RA 9003

Barangay	Compliance Rating to Key Provisions of RA 9003											
	SWM Plan		Waste segregation		Recycling		Composting		MRF Establishment		Burning/dumping prohibitions	
	W/o proj	W/ proj	W/o proj	W/ proj	W/ proj	W/o proj	W/o proj	W/ proj	W/o proj	W/ proj	W/o proj	W/ proj
Bgy. Sto. Nino	3	8	No	9	7	9	No	9	No	9	7	9
Bgy. 598	No	7	No	5	No	5	No	None	No	None	AE	9
Bgy. 52	No	3	No	3	No	8	No	None	9	None	AE	9
Bgy. 56	No	5	1	9	1	9	No	None	No	None	AE	NR
Bgy. VASRA	No	8	No	7	No	7	No	None	No	5	No	10
Bgy. Niugan	NR	7	NR	5	NR	9	No	None	No	8	AE	9
Bgy. Pilar	No	NR	No	7	No	7	No	None	No	8	1	10
Bgy. Rosario	1	8	No	8	No	8	No	No	No	9	AE	NR
Bgy. Tanza	5	9	4	8	5	9	4	8	8	10	5	9
Bgy. COMEMBO	5	8	5	9	5	9	Yes	Yes	5	9	AE	NR
Bgy. Tunasan	Yes	NR	2	7	2	7	No	None	No	8	AE	9
	5/11	9/11	4/11	11/11	5/11	11/11	2/11	3/11	3/11	8/11	10/11	11/11

No means non-compliance to the RA 9003 provision cited.

NR – no response

AE – already enforcing the provision

Table 2. Barangay Compliance to Project MOA

Barangay	Compliance to Key Provisions of the Project MOA					
	Site for MRF	Materials & facilities for MRF operations	Personnel assigned to supervise MRF operations	Sustain the operations of MRF	Ensure that junkshops are sanitary and orderly	Submit monthly monitoring reports
Bgy. Sto. Nino	Yes	yes	yes	yes	yes	yes
Bgy. 598	No	yes	yes	NA	yes	yes
Bgy. 52	No	NA	yes	NA	yes	no
Bgy. 56	No	NA	yes	NA	yes	yes
Bgy. VASRA	Yes	no	yes	yes	yes	no
Bgy. Niugan	Yes	-	yes	yes	yes	no
Bgy. Pilar	Yes	yes	yes	yes	yes	yes
Bgy. Rosario	Yes	yes	yes	yes	yes	yes
Bgy. Tanza	Yes	no	yes	yes	yes	yes
Bgy. COMEMBO	Yes	no	yes	yes	yes	yes
Bgy. Tunasan	Yes	no	yes	yes	yes	yes
	8/11	4/11	11/11	8/11	11/11	8/11

4.2.3 Relevance of the Project to the Needs of the LGU

Eight of the 11 pilot barangays (73%) gave a high rating (8 and above) on the importance of the project to their SWM efforts (Table 3). The rest of the barangays, namely: barangays 598, VASRA and Pilar also gave a good rating of 7 to the project in terms of its relevance to the needs of the locality. The project was viewed as a vehicle that facilitated the implementation of the barangays' mandate on ESWM.

About 70% of the barangays which gave ratings, graded MMDA and NSWMCS with a high mark (8 and above) in terms of the support they provided in the implementation of the project in the locality (Table 3). All the barangays gave a very high rating to their core group because of the high level of support the members provided in the implementation of the project activities.

For the project to be more relevant to the LGUs' needs as far as their mandate on SWM is concerned, the pilot barangays gave several suggestions (Table 4), some of which are unique to their case while the others they commonly share. In summary, the pilot barangays **suggested the following improvements in the design and implementation of the project**, in the event of its replication, so that it will be more responsive to the needs of barangays:

- 1) more intensive IEC campaign to cover all households in the barangay especially depressed or squatter areas;
- 2) efficient garbage collection and more intensive collection in areas near rivers and creeks;
- 3) encourage composting at the household level in their backyards or using containers such as big pots;
- 4) composting machine and equipment for barangays with potential supply of compostable materials such as those collected from wet markets;
- 5) better and sturdier ecotrikes should be purchased to maximize their life span;
- 6) adequate training for barangay implementers including their private cooperators and volunteers;
- 7) involve schools and school children in segregation and collection of recyclables in their homes;
- 8) enforcement of fines and penalties (violation tickets) to violators; and
- 9) deputize more SWM enforcers.

Table 3. Importance of the Project to ESWM Efforts of Barangay

Barangay	Project Importance Rating	Level of Support Rating		
		Core Group	MMDA	NSWMCS
Bgy. Sto. Nino	9	9	10	10
Bgy. 598	7	NR	NR	NR
Bgy. 52	9	9	9	7
Bgy. 56	9	8	5	10
Bgy. VASRA	7	9	9	9
Bgy. Niugan	8	8	9	9
Bgy. Pilar	7	8	10	NR
Bgy. Rosario	9	8	8	10
Bgy. Tanza	9	9	5	10
Bgy. COMEMBO	9	9	9	9
Bgy. Tunasan	8	7	4	7
Average	8.27	8.40	7.80	9.0

NR – no response

Table 4. Proposed Improvements in CBESWMP Design to Be More Responsive to LGU Needs

Barangay	Proposed Improvements
Barangay Sto. Nino	• Marketing assistance for compost. • More intensive information campaign in depressed (squatter areas). • Intensify garbage collection in areas near rivers and creeks. • Provide service vehicle for collecting recyclables from commercial establishments.
Barangay 598	• Ensure that MRFs are provided to barangays. • Composting machine should be provided to barangays since wastes from wet market are ideal for composting. Instead of being thrown into the drainage causing its clogging, market wastes can be composted and sold. It will save money spent on declogging drainage and earn additional income for the barangay especially the Ecoaides. • Better and sturdier pushcarts (the wooden wheels should be replaced by iron to prolong the life of the pushcart).
Barangay 52	• Seminars for all households. • Intensify IEC campaign.
Barangay 56	• Intensify public information. • Training of barangay implementers. • Issuance of violation tickets to non-compliant residents.
Barangay VASRA	• Composting equipment and follow-up training. • Provide more ecotrikes
Barangay Niugan	• Provide barangays with big area and population with mini-dump trucks for collecting wastes. • Provide bigger weighing scales. • Provide support for training of new members of core group and Kagawads. • Provide composting facilities if space is available. • Provide more durable bicycles (easily get rusted; maintained by Ecoaides from the sale of recyclables).
Barangay Pilar	• Intensify IEC. Better participation of LGU and other barangays. • Pass ordinance on ESWM. • Strengthen enforcement and adopt ticketing of violators (barangay is presently slapping fines of P1,000 for violators). • Signages and bill boards on ESWM in vacant lots
Barangay Rosario	• Distribute more IEC materials. • Enforce law with the issuance of violation tickets.

	• Deputize more enforcers.
Barangay Tanza	• Seed money to buy recyclables. • Additional information materials and training for new personnel. • Composting equipment like rotary mixer and shredder. • Deputize more enforcers of SWM.
Barangay COMEMBO	• More information materials should be distributed. • Provision of mini-dump truck to collect and dispose the wastes of big barangays in the dumpsite.
Barangay Tunasan	• Strengthen IEC campaigns. • Involve schools in recycling efforts. • Tap church and other sectors to promote ESWM. • Expand CBESWMP to other barangays. • Strengthen enforcement of RA 9003 and ordinances on SWM through tapping the services of barangay police, Ecoaides, informers of violators. • Adopt the ticketing of violators through the issuance and implementation of an ordinance with provisions on fines and penalties.

4.2.4 Efficiency of Project Implementation

Timeliness of Project Implementation

Despite the lack of time and few remaining funds, the project was able to accomplish its major deliverables. The PMO craftily optimized the use of funds to finance pending major deliverables by skipping the implementation of less critical project activities such as educational travels in other countries. Instead, the money for this activity was channeled to more important deliverables such as MRF construction and printing of information and education materials.

Most of the deliverables of the project were noted by the barangay respondents to have been delivered on time. However, the major set back of the project as a whole was the **delay in the construction of MRFs** and the failure of the three barangays: Barangays 598, 52 and 56 to provide suitable site for their MRFs.

The other problems and issues encountered by the project in the construction of the MRF are briefly described below per barangay.

Problems and Issues on MRF Construction

Failure of barangays to comply on time with requirements such as lot title, locational clearance, and building permits either delayed or aborted MRF construction by the project. MRF was not constructed in Barangays 52, 56 and 598 due to various inevitable causes. On the other hand, mobile MRF (container van) was constructed in barangays Niugan and Rosario because of the lack of available site for building construction.

In some barangays, the residents opposed the construction of MRF in their neighborhood because they compare it to mini-dumpsites which are smelly, noisy and crawling with insect pests.

Barangays 598, 52 and 56 failed to meet the requirements for the construction of MRF due to several problems and issues they encountered and which were not resolved. These problems are briefly described below.

- **Barangay 598** - The barangay failed to get a permit from the City Government for the use of its lot to construct the MRF building. The City Council was not able to meet the request of the project to issue an ordinance for the deed of donation of the land where the MRF will be located. Moreover, the site was found to be easily flooded and would require earthworks and concreting to elevate it which would entail additional cost. But according to the barangay officials, they submitted all requirements for the establishment of an MRF but the construction was delayed due to the revision in the design of the MRF. They claimed that the former PMO disapproved the inclusion of a comfort room in the design. Eventually, no MRF was constructed even a mobile MRF because the streets are too narrow for the container van to pass through.
- **Barangay 52** – Unfortunately, the barangay was not able to find a suitable space for a bigger MRF. The prospective site is located in the land owned by PNR but there is an existing claim on this land by a private individual who is reportedly a

former barangay councilor. A mobile MRF was proposed to be housed inside a school yard but this was reportedly disapproved by the City's Environmental Sanitation Service (ESS). The barangay is now using the old barangay office or station (about 4 by 4m space) as its temporary MRF.

- **Barangay 56** - No MRF building was constructed under the project due to the absence of a suitable site. The site identified near the railroad is not suitable because it will be covered under the expansion plan of the South Rail Project. Temporary MRF (2x2 meters in size) is located inside the barangay office to store recyclables.

The difficulties encountered by the different pilot barangays in the construction of MRF, which upset the project's timetable are briefly discussed below.

- **Barangay Sto. Nino** – There was difficulty in locating a site that is owned by the government. If the volume of recyclable wastes grows, a bigger and permanent MRF is planned to be constructed in a government land along JP Rizal. The site poses no problem because there are no nearby residential areas.
- **Barangay VASRA** – Difficulties were encountered in finding a suitable site because residents in the area oppose the establishment of MRF near their neighborhood. There is a plan to relocate the existing MRF built by the project to a new site which has already been identified because the present site will be used for the construction of a government housing project. The new site is at the back of the Public School Teachers' Association building.
- **Barangay Niugan** – The barangay had difficulty in locating available space for MRF construction. At the same time, residents object to MRF because they think it is dirty, noisy and emits foul odor. A mobile MRF (20-foot van located in the sidewalk across the fire station) was instead constructed. The mobile MRF is currently used for storing dry materials like cartons and papers. The barangay's old temporary MRF located at the barangay hall is used to store bottles, glass, tin cans and other greasy recyclable materials. The mobile MRF is always maintained dry clean and also used as a sleeping quarter of the lone Ecoaide of the barangay.
- **Barangay Pilar** – The barangay had no problem with MRF establishment since the barangay LGU provided the lot and building and the project provided for the expansion of the MRF. The MRF is an extension of the existing barangay building located at the back of the barangay hall.
- **Barangay Tanza** – The barangay attributes the delay in the construction of its MRF to the inactivity of the PMO during the period when the project was transferred from the MMDA's Solid Waste Management Office (SWMO) to the Metropolitan Sanitation Management Office (MSMO). The period when MRF construction became inactive, according to the barangay Chair, lasted for twelve months (January – December 2005), which was the transition period for the PMO. PMO2 was then transferred to NSWMCS – DENR starting January 2006 during which project activities were continued including the completion of the construction of MRF. Hence, most of the MRFs' in the different pilot barangays were inaugurated from March to May 2006.

- **Barangay Rosario** –Before the project, the barangay has a mini-MRF in the form of a 4x4 cubicle. The selected site for MRF construction along ROTC was occupied by a funeral parlor. Thus, the barangay opted for the construction of a mobile MRF instead. However, the mobile MRF can not also pass through the narrow street of the selected site. Another site was selected; it is located in the Clean and Green Department Office of the barangay and it is where the mobile MRF now resides. Even the other Puroks of the barangay outside the scope of the project area are now also serviced by the MRF.
- **Barangay COMEMBO** – Similar to the case of Tanza, the delayed construction of MRF was due to the inactivity of the project for one year before a new PMO was organized and later transferred to NSWMCS.
- **Barangay Tunasan** – The barangay did not report any significant problem they encountered in the construction of its MRF. Their problem at present is that the City LGU has also its own MRF located inside the barangay. The City's MRF reportedly competes with the project's MRF and a cause of friction between the barangay MRF manager and the City's Solid Waste Management Officer.

Problems and Issues on Ecological Solid Waste Management at the Barangay Level

Several problems and issues on ecological solid waste management in the pilot barangays were documented because they are hurdles to be overcome in the smooth implementation of the CBESWMP project. These **problems and issues involving the disposal of wastes by residents of the pilot barangays** are briefly described below.

- **Barangay Sto. Nino** – It is the common practice of several households to hang their bags of wastes in posts, trees and fences. Some households dump their garbage bags in sidewalks being confident that the garbage trucks will pick them up. Likewise, some households do not segregate their wastes.
- **Barangay 598.** - Barangay 598 is scheduled last in the collection of wastes by garbage truck collectors because they get minimal recyclables from the barangay. The garbage truck is already full when they reach barangay 598 and some wastes are left behind. Most of the renters living in the barangay do not cooperate and follow the rules on proper solid waste disposal. They just throw their uncollected wastes into the river, sidewalks and streets. They usually send their children to dump their wastes in prohibited sites thinking that they will not be apprehended because they are minors. The barangay also complains that during heavy rains, the wastes from the upper barangays are carried by floodwaters to them. Even if the barangay keeps its surroundings clean, this phenomenon makes their environment dirty during the rainy season.
- **Barangay 52** - Collection of garbage is not done daily resulting in the accumulation of wastes which are then dumped by residents in the streets and designated pick-up points. Barangay 52 adopts a different method of garbage collection: the Ecoaides collect the garbage from households with narrow streets and bring them to a collection point (curbsite) for the garbage truck to pick-up three times a week (MWF). The collection site is located adjacent to the

temporary MRF (5x2 meters) in the former barangay office. The Ecoaides are only allowed to place the wastes in the collection point during the time the garbage truck is scheduled to arrive. Solid wastes disposed by households are partially segregated but the garbage truck collects even mixed wastes. Another problem in the implementation of the project was that about 50% of the households did not attend meetings and seminars on proper waste disposal conducted by the barangay.

- **Barangay 56** -. The barangay had difficulty in implementing segregation at the start of the project; about 20% of the households do not want to segregate their wastes and the garbage truck collectors collected all wastes even those which were not segregated. The barangay posted stickers on the walls of violators and non-compliant households. Now about 90% of households are reported by the barangay to segregate their wastes. The problem of the barangay is how to recycle plastic bags used for packaging items bought in malls and grocery stores. Plastic bags thrown as wastes usually end up clogging drainage in the barangay causing flooding of streets. During the rainy season, bags of wastes from nearby upstream barangays like Barangay 52 are carried by flood waters running through the streets and settling down and scattering wastes all over Barangay 56. To solve this problem, Barangay 56 constructed a grilled gate in the entrance of their barangay's street which conveys the flood water from the other barangays to filter out the bags of wastes from entering their area.
- **Barangay VASRA** – About 30% of the households do not segregate their wastes. At first, contracted garbage trucks do not collect unsegregated wastes but now all wastes are collected, even mixed wastes. The barangay knows which households violate the regulation and send them reprimand letter. If they still do not comply, the barangay reports them to the environment police of the LGU's Environmental Protection and Waste Management Division. Another problem of the barangay is the number of ambulant vendors passing through on their way to the junkshops. About 50 junkshops are found in the vicinities of VASRA and there are estimated 50-60 pushcarts which pass through Visayas avenue and other streets of barangay VASRA and try to salvage recyclables from parked garbage bins or garbage plastic bags. This causes the spillage of waste in the sidewalks and streets making them dirty and smelly.
- **Barangay Niugan** – About 10% of the households illegally dump their wastes in the sidewalks, streets and river. Most of those who are lazy to segregate their wastes are located in depressed areas of the barangay. Delay in the collection of garbage by dump trucks causes the accumulation of garbage bags in the sidewalks and streets of the barangay. Collection is door-to-door but even mixed garbage is collected and there is no color coding of plastic bags. The households keep their wastes in their waste bins which they keep inside their homes to keep the sidewalk free from obstruction. During the scheduled day of collection, when the garbage truck arrives, the barangay announces through their megaphones or the trucks blow their horn to alert the households to bring out their wastes. The barangay occasionally suffers from the pollution of mass of wastes carried by water runoff or floods from upstream barangays. This incident burdens the barangay's clean-up efforts and in maintaining cleanliness of its surroundings.

- **Barangay Pilar** - Meetings had low turn-out which delayed project implementation. The barangay captain noted that disposal of wastes depends on the location. For old residents, they maintain their bad practice of hanging their plastic waste bags in fences, walls or trees in front or near their houses for pick up by garbage trucks. The project activities including the MRF operations in the barangay stopped during the time when the management of the project was transferred from MMDA's SWMO to MSMO. The cause of the stoppage was reportedly a miscommunication between the SWMO and the barangay officials.
- **Barangay Tanza** - Some households living near the river throw their wastes into it. This prompted the barangay to form the Bantay Ilog (River Watch) groups to monitor and apprehend violators. Some areas are used as dumping sites by some non-compliant households and these areas are closely monitored by the barangay's ecoenforcers to catch violators. Heaps of wastes from other barangays find their way into the Tanza river (Navotas rivers) through the Tullahan river (a highly polluted and dead river). Most of the wastes reaching the Tanza river come from Pier 18 and the Metro Manila cities and municipalities. The burden of cleaning these wastes in the river is shouldered by the barangay of Tanza. With regards to the operations of the barangay's MRF, seed money of P50,000 is needed by MRF operators to buy recyclables since many households are already selling their recyclables.
- **Barangay Rosario** - The garbage collection trucks, which are contracted by the City LGU collect mixed wastes. The garbage truck collectors segregate the recyclables from the mixed wastes. Segregation is not compulsory in the collection of garbage in the barangay.
- **Barangay COMEMBO** – The barangay had difficulty in implementing segregation at first. This problem was solved by patiently training households by pilot streets first before doing it in other zones (i.e., one zone = 2 to 3 streets). Meetings were conducted in every street on how to segregate wastes and the ordinance to support RA9003 was explained clearly to the residents. Barangay COMEMBO is experiencing problems on the spillage of wastes in the sidewalks and streets due to scavenging by pushcart vendors coming from other barangays.
- **Barangay Tunasan** – wastes from upstream barangays are carried by flood waters and deposited in the streets during heavy rains. The river is used by some households as dumping ground for their garbage.

The project implementation issues and problems encountered by the implementing organizations (MMDA/PMO1, NSWMCS, PMO2 and UNDP) are listed in Table 5.

Table 5. Project Implementation Issues and Problems Encountered by the Implementing Organizations

Organization	Implementation Issues and Problems Encountered
MMDA/PMO1	• It took some time for LGUs to endorse their chosen pilot barangays. • Lack of appreciation of the project by top MMDA official giving it less priority. • Mass resignation of community organizers due to poor support from top management of MMDA. • Poor system of project fund administration which adopted the regular agency procedures. • Unclear roles and responsibilities of project implementers. • Lengthy process of site selection and MRF establishment. • Lack of leadership and capability of barangay LGUs. Some barangay heads either did not have enough time to attend to the project or lack the capability to implement the project's activities.
NSWMCS	• Unclear delineation of the responsibilities of organizations implementing RA 9003. • Composting may not be applicable to some highly urbanized barangays. • Training assistance provided to barangays was not based on the outcome of the TNA.
PMO2	• Delayed processing of project requirements (release of funds for project operations). Work and financial plan was not adhered to by MMDA officials; some deliverables were not pursued. • Some LGU officials did not fully enforce RA 9003 for fear of losing votes come election. • Most LGUs lack the resources to sustain IEC campaign. • Resistance of many households to practice segregation.
UNDP	• Project implementation stopped for 6 months prior to the transfer of project execution from MMDA to NSWMCS. Barangays Tanza and COMEMBO resented the project stoppage because they were not properly notified. Barangay Pilar stopped its MRF operations during the lull period. • Mass resignation of PMO staff due to weak support from MMDA top leadership. • Some City/Municipal LGUs were not too enthusiastic about the project and did not assign a permanent focal point; there were frequent changes in representatives to meetings and project activities.

Implementation Issues and Problems Encountered by the MMDA

Several issues and problems in the implementation of the project were raised by the MMDA respondents during the survey interview. These issues and problems include: 1) inefficient system of fund administration; 2) unclear roles and responsibilities of project implementers; 3) low level of appreciation of the project by the top official of MMDA; and 4) lack of leadership and capability of some barangay LGUs. The highlights of these issues and problems are briefly described below.

1) Inefficient System of Fund Administration

According to the MMDA respondent, the COA suggested that the implementing agency should handle the project's account, although the UNDP fund could be directly accessed by the Project Director. Thus, the project's request for funds and their approval and releases went through the regular financial management process of MMDA with its Chair signing the checks. The lengthy processing of funds delayed the implementation of the components of the project.

Another problem encountered in budgeting was that the budget allotment for the construction of MRF was underestimated by the MMDA PMO.

2) Unclear Roles and Responsibilities of Project Implementers

The Terms of Reference of the Project Manager and Project Director were not clearly defined causing some confusion in the process of implementing the project. Moreover, the roles of the City and barangay LGUs, MMDA, private collectors, civic organizations, NGOs and households were not explicitly defined to facilitate the implementation of CBESWMP. To cope up with the situation, the PMO adopted flexibility in terms of implementing certain activities of the project.

3) Low Level of Appreciation of the Project by MMDA Top Official

The idea of compulsory waste segregation did not augur well with the MMDA Chair as the key solution to improving solid waste management. Because he was not fully convinced about the effectiveness of waste segregation at the household level, the MMDA Chair instructed the project management to focus more on door-to-door collection, which when done properly will keep the surroundings clean and sanitary.

Door-to-door collection is viewed as a tool to improve segregation at source. Door-to-door collection ensures collection efficiency and cleanliness of sidewalks and streets. The MMDA respondent explained that the Metropolitan Sanitation and Management Office (MSMO) gave more impetus on the sanitation and door-to-door information campaign aspects of the project during the time when management of the project was turned-over to the office from the Solid Waste Management Office (SWMO). The MMDA Chair wants to keep the sidewalks and streets clean of garbage and the door-to-door policy is seen as the key to this vision. The project was transferred to NSWMCs in January 2006 when the MMDA Chair decided to terminate the project.

4) Lack of Leadership and Capability of Barangay LGUs

The barangay captains of pilot sites are expected to take the leadership in the implementation of the project but this is not an assurance that they will be able to steer the project into its successful finish and sustain its initiatives because they either lack the capability or the time and focus to attend to the project. The project's implementing agency had a hard time looking for "champions" in the Barangay. In some pilot barangays, the Kagawad on Solid Waste Management plays a more active role in the implementation of the project on the ground.

Many Barangay Officials lack knowledge about the provisions of RA 9003. Furthermore, the Barangay LGUs' capability to monitor, and sustain operations of CBESWMP is still weak and would require capability building and technical support.

Factors Affecting the Efficiency of Project Implementation

There were several factors that delayed and facilitated the implementation of the project components and activities. These factors are enumerated in Table 6 from the perspective of the implementing agencies such as the MMDA/PMO1, NSWMCS, PMO2 and UNDP.

The **common factors delaying the implementation** of the project were: 1) bureaucratic system in funds management resulted in late releases of funds; 2) unclear roles and responsibilities of Project Director and Project Manager; 3) less active participation of some barangay Chairs; 4) poor enforcement of RA 9003; 5) inactivity of MMDA-PMO and failure to communicate to barangay LGUs during project management transition period; 6) difficulty in acquiring sites for MRF construction.

On the other hand, the implementation of the **project was facilitated by the following factors**: 1) high competency of PMO1 and PMO2; 2) good cooperation and support from barangay officials; 3) active participation of household community groups and NGOs, 4) better coordination between City/Municipal LGUs - SWAMO and NSWMCS; 5) full support by NSWMCS top officials; 6) dedicated and committed PMO staff; 7) simplified system of fund management involving faster processing, approval and releases of funds; 8) strong leadership of some barangay Chairs and Kagawads; and 9) better social preparation of communities through community organizing.

Table 6. Factors Affecting Project Implementation

Organization	Delaying Factors	Facilitating Factors
MMDA/PMO1	• Lack of experience in implementing UNDP-assisted types of projects. • Retirement of Project Director without formal turn-over of project and full briefing of MMDA top official. • Late releases of project funds. • Confusion due to unclear responsibilities of Project Director and Project Manager. • Less active participation of some barangay captains.	• Knowledgeable, active and determined head of the PMO of MMDA. • The active participation of some barangay captains and many of the Kagawads on SWM.
NSWMCS	• Weak enforcement of law. • Lull period prior to the transfer of project from MMDA to NSWMCS.	• Support provided by core groups and NGOs. • Better coordination between LGUs and NSWMCS.
PMO2	• Delayed processing of project requirements under MMDA. • Inadequate support from LGUs (city and barangay) in disseminating information on RA 9003. • Signing of documents took a long time because of bureaucratic process. • Location of sites for MRF faced several problems.	• Full cooperation of NSWMCS officials and staff in the implementation of project activities. • Dedicated and committed PMO staff. • Proper financial management. Simplified system of project request processing and approval. • Active support of UNDP and timely releases of funds. • Support from NGOs pushed forward the implementation of project activities.
UNDP	• Centralized financial management following regular agency procedures. • Approval of project activities had to be sought from top MMDA executives. • Mass resignation of PMO staff.	• Good cooperation of barangay and city/municipal LGUs. • Strong leadership of barangay captain and barangay Kagawad on ESWM. • Better social preparation of communities through community organizing.

The **recommendations made by respondents** from MMDA/PMO1, NSWMCS, PMO2 and UNDP **to improve CBESWMP project operations**, in case the same type of project will be implemented in other barangays, are given in Table 7.

Table 7. Recommendations to Improve CBESWMP Project Operations

Organization	Recommendations to Improve Project Operations
MMDA/PMO1	• Training of barangay officials in monitoring and sustaining the CBESWMP activities. • Intensified IEC campaign on segregation. • Promote door-to-door collection of garbage to maintain the cleanliness of surroundings especially sidewalks, streets and creeks and rivers. • Provide simplified guidelines to the barangays on how to fully implement the provisions of RA 9003. • Use of junkshops as MRFs in the absence of space to construct MRF building or mobile vans. • Clearly define the roles and responsibilities of implementing agencies in the operations of CBESWMP. • Provide guidelines on the use of income from MRF. • Promote backyard composting for areas with no adequate space. • Educate households on what types of wastes are toxic and hazardous and how they should be disposed properly. Provide a separate garbage collection truck for toxic and hazardous wastes.
NSWMCS	• TWG should be a part even in the initial formulation of the criteria for Site/beneficiary selection. • Space for MRF should not be a problem. Each barangay can have its own approach in the establishment of MRF. An MRF may cover a cluster of barangays. • To attain replication, the necessary adaptable system should be properly documented. Best practices should be propagated. • Coordination between NSWMCs and LGUs (municipality and barangay) is working well. • The project should be spread out to areas outside of Metro Manila such as Region IV and the Cordilleras. Major shipping ports should adopt the ESWM project and use container vans as their MRFs. • Composting may not be applicable to some highly urbanized barangays. • MOA with LGU should be first established before the implementation of project. • Training assistance provided to barangays should be based on the outcome of the TNA. • Need to track or monitor where the garbage goes.
PMO2	• Involvement of the school and school children in waste segregation and recycling.
UNDP	• Strengthen the capability of barangays to implement ESWM. • Closely monitor compliance to RA 9003. • Designation of permanent LGU representative to future CBESWMP undertakings.

The **performance of PMO1 and PMO2** was rated by the respondents from the pilot barangays. All the barangays gave ratings on the performance of PMO1 while ten barangays provided ratings for PMO2. The results of the ratings are provided in Table 8.

Both PMOs got satisfactory rating in managing the implementation of the project. Of the 11 barangays, 9 gave PMO1 a very high rating of 8 and above. PMO2 got a high rating of 8 and above from 9 of the 10 barangays which rated them.

Table 8. Performance Rating of PMO

Barangay	Performance Rating	
	PMO1	PMO2
Bgy. Sto. Nino	9	8
Bgy. 598	8	8
Bgy. 52	9	9
Bgy. 56	5	10
Bgy. VASRA	9	9
Bgy. Niugan	8	9
Bgy. Pilar	10	NR
Bgy. Rosario	8	10
Bgy. Tanza	5	10
Bgy. COMEMBO	9	9
Bgy. Tunasan	8	7
Average	8.0	8.9

PMO1 – January 2002 to December 2004 (36 months)

PMO2 – July 2005 to October 2006 (16 months)

NR – no response. Respondents are not sure or confident on what rating to give.

4.2.5 Effectiveness of Project Outputs

The effectiveness of the project outputs was measured in two ways: 1) based on the rating of the pilot barangay LGUs and the City/Municipality solid waste management officers; and 2) based on project cost effectiveness index.

Effectiveness Rating of Outputs by Barangay LGUs

The effectiveness ratings of the project's outputs made by the pilot barangay LGUs are shown in Table 9. The project outputs, which were rated according to their level of effectiveness include: site selection for MRF, community organizing, participatory SWM planning, IEC materials and campaign, training conducted, segregation, door-to-door and unified SWM, MRF building/van, wooden pushcarts, ecotrikes, and M&E system.

Almost all the project's outputs were rated very high (8 and above) in terms of their effectiveness by majority of the respondents from pilot barangays (Table 9). Most remarkable is the very high rating (8 and above) given by all the 11 barangays (100%) to the effectiveness of the training conducted by the project. Similarly, the IEC materials and campaign got a very high rating from 10 of the 11 barangays. Community organizing, and participatory ESWM planning, also did very well with 9 of the barangays giving them very high rating.

The other project outputs that got very high effectiveness rating from the pilot barangays are: M&E system (9 out of the total 9 barangays which responded); ecotrikes (also 9 out of 9 respondents); and wooden pushcarts (4 out of 5 respondents since some of the barangays did not receive pushcarts). The output on door-to-door and unified SWM information materials got a very high rating from 7 of the 9 pilot barangays which responded to the question item.

Comparatively, the **project outputs which got low ratings (i.e., the least number of high ratings) from the respondent barangays include the site selection of MRF, segregation of wastes and the construction of MRF building.**

Effectiveness Rating of Outputs by City/Municipality Solid Waste Management Officers

The solid waste management officers interviewed gave very high rating (8 and above) on the effectiveness and level of success of the following deliverables of the project: IEC materials and campaign (10 out of 10 respondents gave very high rating); collection of recyclables (8 out of 9 respondents); and training and orientation seminars (8 out of 10 respondents).

The project deliverables, which got a fair number of respondents giving them very high rating include: community organizing and planning (7 out of 10 respondents) and MRF operations (7 out of 10 respondents). Two respondents gave their MRF operations a low rating, namely: Manila with a rating of 3 and Las Pinas with 4. These ratings can be interpreted that MRF operations are only 30% successful in Manila and 40% successful in Las Pinas.

The level of effectiveness or level of success of **segregation in the pilot barangays got the lowest number** of respondents (5 out of 10) who gave it a very high rating. In particular, the respondents from Manila and Las Pinas gave a low rating of 5 to the effectiveness or level of success of segregation. Three other respondents, namely: Quezon City, Malabon and Muntinlupa rated the level of success of segregation with 7. These results can be interpreted that segregation is only 50% effective in Manila and Las Pinas and 70% effective in Quezon City, Malabon and Muntinlupa. These results verify earlier findings about the difficulty of implementing segregation in the pilot barangays.

The results of the ratings obtained from the barangay respondents more or less match those of the City/Municipality respondents. **In summary, the project deliverables which have a high level of effectiveness and success based on the outcomes of the rating made by both the barangay and City/Municipal respondents are IEC, training, and community organizing.** The level of success of MRF operations was rated fair by the two groups of respondents (i.e., 6-7 out of 10 respondents gave it high rating of 8 and above). The **effectiveness of segregation was rated low** by both cohorts of respondents.

Project Cost Effectiveness Index

Cost effectiveness index refers to the cost effectiveness of project investment in changing, *ceteris paribus*, the behavior of households in terms of complying with segregation rule. The index is the amount of investment spent in changing the behavior

of a household to adopt segregation. The lower is the index; the higher is the cost effectiveness.

Based on PMO2 data derived from the reports submitted by the pilot barangays, only two barangays reported compliance to segregation before the project was implemented: Barangays Pilar (49%) and COMEMBO (98%). The rest of the 9 barangays either did not comply nor had very minimal compliance level. **When the project was implemented, all the eleven barangays were able to comply with the segregation rule of RA 9003.** The following barangays registered the highest compliance rate (Table 11): COMEMBO was able to maintain its pre-project compliance rate of 98%; Niugan (70%); VASRA (66%); Tunasan (62%); and Rosario (60%). Five barangays reported a compliance rate of above 40%, namely: Barangay 598 (50%), Sto. Nino (55%), Tanza (49%) and 52 and 56 (43%).

The top two barangays which posted the highest cost effectiveness in changing the behavior of households towards segregation are: Sto. Nino (P313.54/HH) and Barangay 598 (P389.47/HH). Table 11 shows the cost effectiveness index of the other barangays. The other barangays with moderate level of cost effectiveness are: 52 and 56 (P697/HH), Rosario (P707/HH), VASRA (P841/HH) and Niugan (P863/HH). COMEMBO's improvement in compliance rate to segregation was nil because even before the project was implemented it had already a very high compliance rate of 98%. Thus, **it was not cost effective for the project to invest in COMEMBO.** The barangay can do well on its own of maintaining a high level of segregation rate even without the project.

Table 9. Effectiveness Rating of Project Outputs by Barangay LGU

Barangay	Effectiveness Rating of Project Outputs										
	Site for MRF	Community organizing	Participatory ESWM Planning	IEC Materials and Campaign	Training conducted	Segregation	Door-to-door and Unified SWM	MRF building or van	Wooden pushcarts	Ecotrikes	M&E System using PC
Bgy. Sto. Nino	7	9	8	9	9	9	9	9	9	7	9
Bgy. 598	0	10	10	9	10	7	7	None	5	10	8
Bgy. 52	0	10	10	8	10	3	10	None	10	3	2
Bgy. 56	0	7	8	8	10	9	-	None	none	NR	10
Bgy. VASRA	NR	6	7	8	9	7	9	9	9	9	NR
Bgy. Niugan	NR	8	8	8	8	5	9	7	none	8	10
Bgy. Pilar	NR	8	7	5	8	NR	5	NR	NR	NR	NR
Bgy. Rosario	8	9	10	10	10	8	10	10	none	9	8
Bgy. Tanza	10	9	9	8	8	8	9	10	none	9	8
Bgy. COMEMBO	10	9	8	8	10	9	6	9	NA	6	8
Bgy. Tunasan	10	9	9	9	8	9	NR	8	9	9	8
Average	5.62	8.54	8.54	8.18	9.09	7.40	8.22	8.85	8.40	7.77	7.88

NR – no response. Respondents cannot provide a reliable rating.

Table 10. Effectiveness and Level of Success Rating of Main Project Outputs by City/Municipality LGU

City/Mun. LGU Solid Waste Management Officers	Effectiveness and Level of Success Rating					
	Community organizing & planning	IEC materials and campaign	Training and orientation seminars	Segregation	Collection of recyclables	MRF operations
Paranaque	9	9	9	8	9	9
Manila	5	8	7	5	8	3
Caloocan	8	10	10	8	10	8
Quezon City	8	8	6	7	8	7
Malabon	9	9	9	7	9	8
Las Pinas	6	10	10	5	NR	4
Pasig	8	10	9	8	9	9
Navotas	10	9	10	8	8	9
Makati	9	9	9	9	9	9
Muntinlupa	7	9	9	7	7	9
Average	7.9	9.1	8.8	7.2	8.5	7.5

Table 11. Project Cost Effectiveness Index

Barangay	Total Project Cost (Php)*	Segregation Compliance Rate (%) W/O Project	Segregation Compliance Rate (%) W/ Project**	Total Number of Households Within the Project Area	Cost Effectiveness Index Php/HH
Bgy. Sto. Nino	511,664	0	55	2,967	313.54
Bgy. 598	475,164	0	50	2,440	389.47
Bgy. 52	475,164	0	43	832	697.18
Bgy. 56				753	
Bgy. VASRA	818,500	0	66	1,473	841.92
Bgy. Niugan	636,514	0	70	1,053	863.53
Bgy. Pilar	737,247	49	66	1,391	3,117.71
Bgy. Rosario	636,720	0	60	1,500	707.46
Bgy. Tanza	756,022	0	49	1,136	1,358.18
Bgy. COMEMBO	1,208,787	98	98	3,026	1,208,787
Bgy. Tunasan	894,645	0	62	1,507	977.51

*Project expenditures as of June 2006

**PMO data as of 2006 based on reports gathered from barangays.

4.2.6 Project Benefits and Impacts

The project apparently brought about several benefits and impacts to the stakeholders particularly the LGUs and the communities. The **most significant benefits and impacts of the CBESWMP project** are as follows:

- 1) generated income from sale of recyclables which benefited the households, barangay ecoaides, street sweepers, ambulant vendors, garbage truck collectors and junkshops;
- 2) provided employment to ecoaides, street sweepers, SWM enforcers, pushcart vendors, junkshop workers from the sale of recyclables and keeping the environment clean;
- 3) improved cleanliness of environment and minimized hazards to health;
- 4) minimized if not eradicated dumping of wastes on the sidewalks, streets and vacant lots (including hanging of garbage bags on fences, trees and lamp posts);
- 5) minimized odor and spread of vermins (rats, flies and cockroaches);
- 6) improved discipline among households (segregation);
- 7) improved cooperation among households in proper disposal of wastes;
- 8) reduced the volume of wastes collected by garbage trucks and the volume disposed in dumpsites/landfills extending the life span of dumpsites and sanitary landfills);

- 9) reduced the number of trips of dump trucks resulting in savings by LGU on garbage collection;
- 10) proper sorting and storage of recyclables made possible by MRFs;
- 11) capacitated barangay LGUs on ESWM through training, IEC, planning and provisions of equipment and facility (pushcarts, ecotrikes, MRF, composter, computer, weighing scale, etc.).

Table 14 provides the rating made by the respondents from pilot barangays on the major impacts of the project. **The respondents from 10 of 11 barangays gave a very high rating of 8 and above on the project's impact on improving cleanliness and sanitation in the environment (sidewalks, streets and vacant lots) and on improving the knowledge and skills of barangay personnel on ESWM.** Eight barangays gave very high rating on improving income and employment in the barangay; six barangays believe that the project significantly improved the cooperation and instilled disciplined among households and greatly reduced the volume of wastes disposed in dumpsites.

Table 12. Project Benefits and Impacts

Barangay	Rating of Project Benefits and Impacts				
	Income and employment	Cleanliness and sanitation	Cooperation and discipline of households	Reduction in volume of wastes*	Knowledge and skills of bgy personnel in ESWM
Bgy. Sto. Nino	8	9	8	8	9
Bgy. 598	9	9	6	10	9
Bgy. 52	10	9	3	4	NR
Bgy. 56	10	10	9	NR	10
Bgy. VASRA	9	8	7	8	8
Bgy. Niugan	7	NR	8	8	8
Bgy. Pilar	NR	8	6	NR	8
Bgy. Rosario	9	9	9	7	10
Bgy. Tanza	9	9	9	9	8
Bgy. COMEMBO	10	9	9	8	10
Bgy. Tunasan	NR	8	7	5	8
Average	9.00	8.80	7.36	7.44	8.00

*Rating of project's impacts in reducing the volume of wastes (waste diversion).

NR – no response. Respondents cannot provide a reliable rating.

Project Impacts on Waste Diversion and Recycling

The project was able to reduce the volume of wastes collected in pilot barangays by means of improving recycling of recyclables. This, in effect reduced the volume of wastes thrown in dumpsites.

An average of 42% waste volume reduction or waste diversion was registered by the pilot barangays (Table 13). Barangay COMEMBO registered the highest rate of

waste diversion at 80%. Three barangays, namely: 598, Rosario and Tunasan reduced the volume of their wastes collected by dump trucks by half (50%) while barangays Sto. Nino and Tanza posted a waste diversion rate of 40% and 30%, respectively. At the bottom of the list are barangays 56 and Niugan which accomplished 25% and 15% diversion rate, respectively. Three barangays (52, VASRA and Pilar) did not submit an estimate of their waste diversion rate.

Table 13. Project Impact on Waste Diversion* of Pilot Barangays

Barangay	Waste reduction (%)*
Bgy. Sto. Nino	40
Bgy. 598	50
Bgy. 52	NR
Bgy. 56	25
Bgy. VASRA	NR
Bgy. Niugan	15
Bgy. Pilar	NR
Bgy. Rosario	50
Bgy. Tanza	30
Bgy. COMEMBO	80
Bgy. Tunasan	50
Average	42.5

*Estimate on the reduction in the volume of wastes disposed in dumpsites as provided by key respondents.

NR – no response.

The respondents from the pilot barangays gave the following accounts on the benefits and impacts of the project, particularly on waste diversion:

- **Barangay Rosario** – Before the project, two trucks per day were needed to collect the garbage in the barangay. Now, only one truck is needed daily.
- **Barangay Sto. Nino** – Before 5 trucks per day were needed to collect garbage in the barangay; now only 1-2 trucks are needed to collect the wastes in the barangay.
- **Barangay 598** – There was a 50% increase in the volume of recycled materials during project implementation. The project was also able to help the barangay in its efforts to comply with RA 9003. The implementers of the project were able to gain knowledge on the proper ways of disposing solid wastes such as segregation and recycling. They also learned to appreciate the economic benefits of recycling such as the use of waste materials in making flower vases, bags, Christmas lanterns and other home decors. Before, there were lots of households who throw their wastes in the streets, but now there are only a very few left.
- **Barangay 56** - There was a 25% increase yearly in the collection of recyclables. The most significant impact of the project is that the stakeholders (barangay officials and the households) learned and realized the importance of waste segregation, recycling and in keeping their surroundings clean. That there is money in wastes was also realized by the households. The children know what

materials are recyclables and bought by junkshops. In one party given by the Mayor, the hundreds of used packs of Zesto juice drink were collected by the children making the venue clean of litter after the big party. The children also collect tin cans, newspapers, cartons and other recyclables which they sell in junkshops.

- **Barangay Niugan** – Wastes collected by dumped trucks were reduced by about 15% due to recycling.
- **Barangay Tanza** – There was 30% estimated increase in volume of recycled materials when the project was implemented. There are initiatives of the barangay to convert some recyclable materials into decorative and straw ropes to provide livelihood or supplemental income to waste collectors (Ecoaides) and the unemployed.
- **Barangay COMEMBO** – The barangay was able to achieve 80% reduction in the volume of wastes disposed in dumpsites. Before the project, the garbage trucks made 3-4 trips per day; now only 1-2 trips are made daily.
- **Barangay Tunasan** – Before the project, the number of trucks that collect the garbage was about 10 but now this was reduced by half with only 5 trucks adequate enough to collect the wastes from the pilot site. The residents have even learned to sell their recyclables directly to the junkshop because of the good price they get and the additional income they earn from trash. There is now a 50% reduction in the volume of wastes thrown in the dumpsite.

Major Accomplishments of the Project per NSWMCS Assessment:

From the viewpoint of the NSWM officials and key staff, the project accomplished two major tasks required under the project, namely: 1) print IEC information materials and, 2) construct/fabricate MRFs in pilot barangays. **A novel contribution of the project is the establishment of mobile MRFs.**

The project's IEC materials such as Basura Kid and RA 9003 Posters were widely disseminated and got good feedback from their users. Several schools and barangays are still requesting for copies of these IEC materials. The Website is also believed to be very useful in educating the general public which has access to internet facilities.

The project's massive information campaign was also able to mobilize schools to support its recycling efforts. Moreover, the project was able to help the pilot barangays sustain the operations of MRF and continually increase the number of households practicing segregation.

4.2.7 Sustainability Potential of Project Initiatives

There are a number of good reasons why pilot barangays will be able to sustain project initiatives:

- 1) they have already acquired the know-how;
- 2) they have the facility and equipment (MRF, pushcarts, ecotrikes, etc.);
- 3) they have experienced and enjoyed the benefits of segregation and recycling;

- 4) they are earning income from MRF operations that will be the source of funds to maintain the facility and equipment;
- 5) they have already established partnership with and given support by core groups, NGOs and village organizations which will also monitor and push them to deliver whenever they seem to becoming dormant;
- 6) they have brought out champions and leaders on ESWM;
- 7) they have already acquired the cooperation of a large number of residents and have mobilized school children in segregation and recycling;
- 8) they have the mandate to comply with RA 9003 and will be penalized for non-compliance; and
- 9) they are inspired and proud of their achievement in keeping their surroundings clean.

In brief, the barangays are driven to sustain the project's initiatives due to political factors (compliance with the law and fear of being penalized), economic factors (income from MRF and incentive payment for waste diversion from City LGU), environmental and social factors (clean environment, free from vectors of diseases, and satisfied residents), institutional factors (barangay has the capability or know how and basic facility for ESWM), and ethical factors (doing what is good for the residents, fulfilling what is expected of barangay officials and local governance system).

The success of the barangay in sustaining the project initiatives also depend on the support of the City LGU. The City LGU should be able to maintain its efficient collection of garbage and provide guidance, capability building and economic incentive to barangays.

All the pilot barangays, except barangay 598, are confident that they can sustain the project initiatives on segregation and IEC campaign (Table 14). However, almost half of the pilot barangays (45%) either find it difficult or will not be able to sustain training on CBESWMP because they lack the capability to do so.

Training can be sustained by majority of the barangays except 598 and VASRA, which find it difficult by themselves to continue the training on SWM. Barangays 52 and 56 are convinced that they can not do the training by themselves.

Funding for the MRF operations could also be sustained according to the respondents, except for barangays 56, 52 and 598, which were not provided MRF by the project.

Table 14. Capacity of Barangay to Sustain Project Initiatives

Barangay	Capacity to Sustain Project Initiatives			
	Segregation	IEC	Training	Funding for MRF Operations*
Bgy. Sto. Nino	Yes	yes	yes	yes
Bgy. 598	Difficult	difficult	difficult	difficult
Bgy. 52	Yes	yes	no	difficult
Bgy. 56	Yes	yes	no	no
Bgy. VASRA	Yes	yes	difficult	yes
Bgy. Niugan	Yes	yes	no	NR

Bgy. Pilar	Yes	yes	yes	yes
Bgy. Rosario	Yes	yes	yes	yes
Bgy. Tanza	Yes	yes	yes	yes
Bgy. COMEMBO	Yes	yes	yes	yes
Bgy. Tunasan	Yes	yes	yes	yes
	10/11	10/11	7/11	7/11

*Operations and maintenance of MRF, ecobikes, pushcarts, and M&E system

Selling recyclables guarantees the sustenance of the operations of the MRF, maintains existing equipment (pushcarts and ecotrikes, weighing scales) and buying of new ones.

The income from MRFs will also sustain the employment of ecoaides and street sweepers.

Most of the recyclables collected by the barangays and stored in their MRFs are given free by the households although some MRFs are starting to buy from households to compete with junkshop agents. Many low-income residents are already selling their recyclables because of the good price they get from junkshops and this lessens through time the volume of recyclable materials obtained free by the barangay MRFs. The barangays anticipate the fact that in the near future, they have to buy recyclables from the households to stay in the business of getting income from recycling to sustain the operations of their MRFs and to support other operations of their ESWM efforts.

At present, the barangays are getting monthly incomes ranging from a low of P700 to a high of P50,000 from the sales of the recyclables they collect (Table 15). Most of the pilot barangays sell their recyclables to big junkshops outside of their barangays because of the good price they get from these junkshops. A big percentage of the income they get goes to the ecoaides and MRF operators and a moderate share goes to the barangay.

Table 15. Income from Recyclables

Barangay	Mode of acquiring recyclables from households	Monthly cost of buying recyclables	Monthly income from selling recyclables	Location of Junkshops where recyclables are sold	Disposition of Income from Recyclables
Barangay Sto. Nino	Given free – 70%; Buy – 30%	NR	5,000/day?	Outside of barangay – big junkshops	30% to bgy committee on health and sanitation; 70% to NGO operators of MRF
Barangay 598	Given free – 80%; Buy- 20%	NR	4,500	Outside junkshops	All income goes to ecoaides
Barangay 52	Given free	NA	1,400	Outside junkshops	30% to ecoaide; 70% to barangay MRF

					maintenance.
Barangay 56	Given free	NA	800	Outside and inside junkshops	Ecoaides; Rental for tricycle service; lunch for MMDA personnel declogging canals
Barangay VASRA	Given free	NA	6,000	Outside junkshop	Ecoaides; maintenance of MRF
Barangay Niugan	Given free	NA	1,200	Outside junkshops	Ecoaide; Maintenance of MRF and ecobikes
Barangay Pilar	Buy	P2,500/day	50,000	Outside junkshops	10% to Ecoboys; 10% to bgy; 80% MRF (junkshop) operator
Barangay Rosario	Given free	NA	3,600	Outside bgy	10% - bgy; 90% ecoaides
Barangay Tanza	Given free	NA	Bgy MRF – P1,500 Schools – P700	Inside junkshops	Ecoaides and MRF maintenance. School income for school projects.
Barangay COMEMBO	Mostly given free	NA	P9,000-12,000	Outside junkshops	Ecoenforcers and street sweepers; 25% bgy MRF
Barangay Tunasan	Given free – 70%; buy – 30%	NR	P5,000	Outside junkshops	Ecoaide - 100% (maintenance of MRF ecobikes and pushcarts)

NR – no response. Respondents cannot make a good estimate of the cost they shelled out in buying recyclables from households.

NA – not applicable.

In the past years, when only few of the households were selling their recyclables to junkshops, the monthly incomes that the barangays earned from the recyclables were quite substantial. For example, COMEMBO used to get P20,000 per month and VASRA with P12,000 per month

Support by Top LGU Officials to the Project

The support that the City/Municipal LGU will provide to barangays will be crucial in their success to comply with RA 9003 and to successfully undertake CBESWMP. Table 16 lists the present support provided by the LGU officials to the project. The City/Municipal LGUs through their SWM officers also provided the list of potential support they can provide once the project will be replicated in other barangays.

Most of the City/Municipality SWM offices are ready and able to provide the barangays IEC, training, and MRF support for the replication of CBESWMP. They will also provide assistance in the enforcement of the RA 9003 provisions (Table 16).

One of the most important support of the City/Municipal LGUs is to ensure that garbage collection is efficiently sustained. Of the 10 LGUs, only three have their own garbage collection trucks (Manila, Las Pinas and Navotas) while the rest contract out garbage collection. All the LGUs practice door-to-door collection scheme and strictly follow their collection schedules (Table 17). They also enforce the rule on “no collection of non-segregated wastes” but still many of their barangays do not comply yet.

Compliance Rating of Cities and Municipalities to the Segregation Rule of No Collection of Non-segregated Wastes

The Cities/Municipalities with the highest compliance rate to the segregation (i.e., enforcing the “no collection of non-segregated wastes” as reported by their SWM officers include (Table 18): Manila (51%) and Pasig (50%). They are followed in the compliance rate ranking by Malabon (38%) and Makati (33%). Those with less than 30% compliance rating include: Quezon City (26%), Las Pinas (25%), and Muntinlupa (24%). The cities/municipalities with the lowest compliance rate are: Paranaque (16%), Navotas (14%) and Caloocan (4%).

In brief, the statistical reports show that a large volume of **mixed wastes is still being collected by dump trucks in most of the barangays in the ten cities/municipalities covered in the study.** Overall, the average rating of **compliance by the barangays to the segregation rule was only 28% as of 2006.**

Most of the City/Municipal SWM offices had difficulty in implementing segregation among the households primarily because of the lack of discipline of residents with some of them too busy to practice segregation (Table 18). Segregation was particularly difficult to implement in depressed or squatter areas. Transients and renters in the barangays usually comprise the bulk of the violators of segregation rule because they care less about the cleanliness of the environment and will not stay there for long, anyway.

When the non-segregated garbage are not collected by dump trucks, the residents got angry and some of them just throw their wastes in the sidewalks, streets, rivers and vacant lots further worsening sanitation in the locality. In worst situations, one or two residents ran after the garbage collectors with their bolos or threw at them the garbage bags. On the brighter side, some residents learned their lesson and begin to cooperate.

Waste Diversion Rate Attainment of Cities and Municipalities

On the basis of the waste diversion rate, Makati and Paranaque top the list with a record of 54%. Las Pinas and Quezon City have a waste diversion rate of 40% and 30%, respectively. Those with waste diversion in the range of 20-25% are Manila, Muntinlupa, Pasig and Navotas (Table 18). Caloocan (17%) and Malabon (8%) registered the lowest diversion rate.

The average percentage of waste diversion in the 10 cities/municipalities was only 28% as of May 2006. It is interesting to note that the average percentage of diversion rate has the same figure for the compliance rate in the collection of garbage truck of mixed wastes.

Table 16. Support Provided by City/Municipality to the CBESWMP Project

City/Municipality	Present Support to CBESWMP	Potential Support to CBESWMP Replication in other Barangays
Paranaque	• Capability building. • Provision of additional manpower such as street sweepers and garbage watch. • Bicycles for collecting wastes.	• Deputize enforcers. • Showcase Sto. Nino as a model CBESWMP. • Provide video on ESWM to other barangays. • Provide training to barangay SWM personnel. • Strict enforcement of the law.
Manila	• IEC campaign. • Training on recycling, reuse and household composting.	• Training and IEC campaign. • Conduct of Waste Analysis and Characterization Study (WACS).
Caloocan	• Distribution of RA 9003 poster. • House to house information campaign on SWM • Monitoring of MRF operations • Regular garbage collection and waste segregation	• Training • IEC • MRF establishment The mayor gives P60,000 for each barangay to construct their MRF. • SWM Planning.
Quezon City	• Enforcement of the “no segregation, no collection” scheme. • IEC campaign through seminars, orientations and door-to-door campaign on proper solid waste management.	• Provide technical assistance such as community organizing and planning. • Conduct of orientations and seminars on proper solid waste management. • Improve monitoring system by using uniform and standard forms. Possibly adopt website monitoring system.
Malabon	• Manpower in clean-up operations • IEC campaign • Equipment for hauling of garbage, and garbage collection trucks	• Additional equipment like pushcarts, trash busters for door-to-door collection. • Strict enforcement of “no segregation, no collection” policy coupled with massive IEC drive.
Las Pinas	• IEC campaign on waste segregation for waste reduction.	• Funding of the MRF construction.
Pasig	• Deputize environmental police to enforce SWM laws. Training and seminars for barangay officials.	• Establish MRF in every barangay funded by the City.

		• Monitor the performance of the barangay captains in terms of implementing RA 9003.
Navotas	• Deputized barangay Tanod to enforce ESWM law.	• Intensify enforcement of laws. • Provide incentives to enforcers.
Makati	• Manpower support for the monitoring of waste disposal. • IEC on SWM. All streets will be oriented on proper waste disposal. • Provision of waste receptacles. Monthly monitoring of the volume of wastes diverted.	• Deputize enforcers. • Strict enforcement of laws. • Replicate mobile MRF in barangays without adequate space. • IEC materials and campaign.
Muntinlupa	• Separate collection for biodegradables and non-biodegradables. • Apprehension of violators (illegal dumping, scavenging)	• Conversion of junkshops into MRF • Provide appropriate equipment for separate collection of garbage such as trolley bin for houses along the railroad tracks • IEC materials and campaign; enforcement of laws; giving incentives to law-abiding households.

Table 17. Method of Garbage Collection by City/Municipal LGU

City/Mun	Ownership of Garbage Trucks	Collection Efficiency	Mode of HH Disposal	Mode of Garbage Collection
Paranaque	Private contractor	Collection schedule is followed except during heavy rains.	Door-to-door collection by garbage trucks in major thoroughfares. Same mode of collection made by ecobikes in houses located in narrow streets.	Non-segregated wastes are not collected.
Manila	Own 9 units of 6 wheeler dump trucks; private contractor	Collection schedule is followed	Door-to-door; HHs only bring out their garbage when the truck arrives. Garbage bins are discouraged to prevent scavenging.	Non-segregated wastes are not collected. LGU-owned garbage trucks collect wastes left on the streets after collection schedule of city contractor
Caloocan	Private contractor	Collection schedule is followed	HHs only bring out their garbage when the truck arrives	Non-segregated wastes are not collected
Quezon City	Autonomous barangays have their own garbage trucks and as a form of incentive the City government pays them the equivalent amount they spend for hauling their wastes to the dumpsite.	Collection schedule is followed	HHs only bring out their garbage when the garbage truck arrives. The City encourages households to use jute sacks (Sako) as garbage bags.	Non-segregated wastes are not collected.
Malabon	Private contractor	Collection schedule if followed except in times of bad weather, high tides and breakdown of	Door-to-door; HHs only bring out their garbage when the truck arrives	Non-segregated wastes are not collected.

		trucks.		
Las Pinas	LGU owns 70 trucks	Collection schedule of 2 trips once a week by garbage truck is followed. During ordinary days, garbage is collected by the barangay multi-cabs and pushcarts.	Door-to-door collection is followed. HH only bring out their wastes when the truck arrives.	Non-segregated wastes are not collected. Recyclables are placed in separate garbage containers and are given to pushcart boys, barangay multi-cabs and junkshop collectors.
Pasig	Private Contractors	Collection schedule is followed	Door-to-door is adopted. HH only brings out their garbage when the truck arrives	Mixed wastes are collected. The “no segregation no collection” rule is only applied to 40% of the total barangays.
Navotas	Owens 9 garbage trucks with 4 new ten wheeler truck arriving.	Collection schedule is followed.	HHs bring their garbage to designated collection points when the truck is about to arrive. In narrow streets, ecoaides use pushcarts to collect garbage and bring them to designated collection points.	Non-segregated wastes are not collected and violators are issued violation tickets.
Makati	Private contractors.	Collection schedule is followed. Delayed collection happens during heavy rains when there is long queue in dumpsites.	Door-to-door collection is adopted. HHs only bring out their garbage when the truck arrives. In inner narrow streets, barangay sweepers collect the garbage with their pushcarts.	Non-segregated wastes are not collected. 85% of violators are renters or transients.
Muntinlupa	Private contractor	Collection schedule is followed with 70% rating		Non-segregated wastes are not collected.

Table 18. Implementation of the Segregation Rule and Achievement on Waste Diversion by the City/Municipality

City/ Municipality	% of Barangays Complying to Segregation Rule	Waste Diversi on rate (%)	Date of Waste Diversion Record	Difficulties in Implementing the Segregation Rule	Reaction of Households to Non- collection of Unsegregated Wastes
Paranaque	16	54	October 2006	Lack of discipline among residents.	Residents got angry when their unsegregated wastes are not collected. Garbage watch personnel hired by the City check whether wastes are segregated or not.
Manila	51	24	May 2006	Some households do not cooperate. Scavengers dump their residual wastes along garbage collection route.	Non-segregated wastes not collected were dumped along major thoroughfares and vacant lots. Harassment and physical abuse of garbage collectors by throwing wastes at them by a couple of residents. The mopping operations by LGU-owned dump trucks collect wastes dumped in the sidewalks and streets.
Caloocan	4	17	May 2006	Instilling discipline to households.	Some residents dumped their wastes in vacant lots; others learn how to segregate.
Quezon City	26	30	May 2006	Lack of household cooperation.	Residents whose unsegregated garbage was not collected got angry with the garbage truck collectors.
Malabon	38	8	May 2006	Lack of discipline and recalcitrant residents.	The residents reason out that they have no time to segregate. Some leave their mixed garbage outside of their premises.
Las Pinas	25	40	October 2006	Some households lack discipline to segregate their wastes.	Residents got angry when their unsegregated wastes were not collected. They filed complaints to City government.
Pasig	50	20	October	Lack of discipline and interest of	They complained and called the action

			2006	some households. Squatters do not follow segregation rule due to lack of knowledge.	line or just leave the wastes outside their backyard.
Navotas	14	20	May 2006	Lack of concern and discipline among households.	Residents got angry and threw their wastes elsewhere.
Makati	33	54	October 2006	Renters or transients comprise the bulk (85%) of violators. They do not take segregation seriously.	Residents got angry.
Muntinlupa	24	21	June 2006	Some residents have no time to segregate their wastes. Unauthorized collection of wastes by pushcart boys leaves wastes scattered in the streets. Undisciplined residents. Lack of monitoring.	Residents dumped their garbage in the sidewalks and vacant lots at night.
Average	28	28			

* Percent of barangays in the City/Municipality complying with the segregation rule of **no collection of non-segregated garbage** as of May 2006.

4.2.8 Project Ownership and Stakeholder Participation

The strong cooperation and active participation shown by the barangay officials evidently demonstrate their ownership of the CBESWMP project. The level of participation of the stakeholders, on the other hand, got an overall high rating from the barangay implementers (Table 19).

Six of the 9 barangays believe that their households' participation and support to the project were very high (rating of 8 and above) while only three respondent barangays gave low rating to the level of participation by their households (Table 19). The NGOs' were given high rating by 10 of the 11 barangays.

Table 19. Participation of Stakeholders in the Implementation of the Project

Barangay	Rating of Level of Participation	
	Households	NGOs
Bgy. Sto. Nino	8	8
Bgy. 598	10	10
Bgy. 52	3	9
Bgy. 56	9	8
Bgy. VASRA	3	8
Bgy. Niugan	5	8
Bgy. Pilar	8	8
Bgy. Rosario	8	8
Bgy. Tanza	8	9
Bgy. COMEMBO	NR	NR
Bgy. Tunasan	NR	7
Average	6.88	8.30

The households and the NGOs provided and are still giving the following support in the implementation of the CBESW project:

- **Barangay 598** - The vendors association are helpful in complying with recycling of wastes. The barangay Kagawad on SWM, however, is saddened by the fact that the core group in the barangay is not active; they mostly criticize the way the barangay officials implements the project. According to the barangay SWM officials, the core group lacks initiative and they need to be summoned to help in the project's information campaign.
- **Barangay 52** – The women's association and Purok leaders helped in implementing the project activities.
- **Barangay 56** – The core group is comprised of Women's Association, which helps in keeping the environment clean, collects recyclables and gives them for free to the barangay.
- **Barangay VASRA** – The core group and NGOs helps in information dissemination.

- **Barangay Niugan** - Religious group and ladies brigade are active and very helpful in information dissemination; relaying new messages from barangay captain to HH; and distributes flyers and other information materials.
- **Barangay Pilar** - Active homeowners and Purok leaders provide ideas, suggestions and assist in information dissemination. However, some of the members are now inactive in attending meetings.
- **Barangay Rosario** – The barangay health workers and homeowners association helps in information dissemination regarding segregation.
- **Barangay Tanza** - Area leaders and NGOs (religious groups, fishers association, and senior citizens) help in information dissemination. Since the barangay has no Ecoaides, the school children were mobilized and are now very active in waste segregation and the collection of recyclables. it is rather dependent on school children to collect recyclables from their homes.
- **Barangay COMEMBO** – The NGOs help in information dissemination on segregation.
- **Barangay Tunasan** – The NGOs, youth volunteers, Kiwanis, Lions club, Fishermen's association help clean canals, disseminate information, and conduct educational campaigns.

To improve the implementation of the CBESWMP project, the barangays undertake parallel programs and projects as briefly described in Table 20.

Table 20. Barangay Programs and Projects to Support CBESWMP

Barangay	Barangay Programs and Projects to Support CBESWMP
Bgy. Sto. Nino	• Cleanliness, beautification and sanitation program. • Linis Ilog/Sagip Ilog program – removal of wastes in rivers and creeks. • Relocation of squatters living under the bridge. • Street sweeping and repainting of sidewalks. • Passage of resolutions creating committees for enforcement of solid waste management.
Bgy. 598	• Issuances of resolutions and ordinances on solid waste management.
Bgy. 52	• Cleanliness program (“Tapat ko linis ko” – clean my frontage). • Street sweepers.
Bgy. 56	• Tapat ko Linis ko program (clean my frontage). • Clean and green program (the barangay places waste bins in stores).
Bgy. VASRA	• Passes resolutions and ordinance on cleanliness. – • Put up signages and wall notices on waste dumping prohibitions in specific areas. • Distributed leaflets on ESWM. • Held meeting with HH on segregation. • Creek clean-up program (Sagip Batis). • Enforces regulations on unauthorized ambulant vendors who scavenge on garbage and scatter them on streets and sidewalks in the process.
Bgy. Niugan	• Ladies brigade conducts street sweeping every last Sunday of the month. • Samahan Pagkakaisa ng Barangay Niugan conducts declogging in Sitio Jasmin.
Bgy. Pilar	• Plastic bags for garbage. • Lot and building for MRF.
Bgy. Rosario	• Street sweepers are provided by City LGU • Enforcement of laws on SWM • Clean and green program • Landscaping and beautification of surroundings.
Bgy. Tanza	• Bantay Ilog program (River watch program). • Law enforcement - Ticketing of violators by sanitary police • Deputized NGOs to enforce SWM. • Conducts cleanliness contest. • Promotes livelihood from wastes.

	• Linis Ganda Program (Cleanliness and Beautification Program) • Street sweeping (municipal LGU has assigned 36 sweepers to clean 45 streets in barangay Tanza). • Linis Kanal (Cleaning of canals) – two cleaners under barangay payroll.
Bgy. COMEMBO	• Project Angel where school children bring recyclables to schools and stored in the school's Ecocenters. • Conducts Contest on Cleanest and Greenest zone barangay • Provides P3,000 for every zone officials to buy recyclable materials to bring to MRF. • City provides color coded trash bins to households.
Bgy. Tunasan	• Produces its own IEC materials. • Signages and billboards on “pera sa basura” (money in trash) • Landscape beautification (tree planting). • Cleaning of canals by Tanod Bayan. • Linis Ilog (River cleaning) involving the removal of garbage in 2 rivers and one creek by NGOs, Fishermen association and Homeowners' association.

4.2.9 Replicability of the Project

All the barangay respondents and the City/Municipal SWO are confident that the CBESWMP has a high level of replicability. Replicability is viable because of the simple and easy to follow CBESWMP system and procedures, self-sustaining MRF, effective IEC materials and the presence of living showcases. Moreover, the City/Municipal SWM officers also affirmed their support in the replication of the CBESWMP project in other barangays of their area of jurisdiction.

According to the respondents in the pilot barangays, the best practices on ESWM, which other barangays may learn from them, are as follows:

- **Barangay Sto. Nino** – The solid waste management in Grandia subdivision is worth emulation as a case wherein the homeowners' association takes the initiatives in keeping their surroundings clean and in disposing their solid wastes in accordance with RA 9003..
- **Barangay 598** – The barangay is proud of its “bayanihan” style of cooperation in waste segregation. It also boasts about the success of its program “Tapat ko Linis Ko” which means that the households always keep their front yards clean.
- **Barangay Niugan** – Barangays without space for MRF building can learn from the experience of barangay Niugan's mobile MRF. The barangay is also a show case for eradicating the old practice of hanging waste bags in fences, posts, trees and other places.
- **Barangay Pilar** – The barangay is a case example of a successful partnership between the barangay and junkshop owner in the operation of MRF. The junkshop operates and maintains the MRF and remits part of the income to barangay LGU.
- **Barangay Tanza** – The barangay is proud of its program in mobilizing the students in the segregation and recycling of wastes. The different schools allotted space to house ecocenters, which can be demonstrated as a good substitute for MRFs. It is also a showcase of the partnership between the barangay and the school in the operations of the barangay MRF.
- **Barangay Rosario** – Other barangays can learn much from the successful operations of the mobile MRF in the barangay.
- **Barangay COMEMBO** – The complete cycle of ESWM including composting can be seen by other barangays in COMEMBO. Moreover, the high rate of compliance by households to waste segregation at source can be seen in this barangay. The barangay's clean and beautiful streets will encourage other barangay to seriously implement ESWM.
- **Barangay Tunasan** – This barangay showcases the successful use of trolley bins for collecting wastes in houses located along the railroad tracks. It has a well-organized MRF and clean streets.

All the City/Municipal SWM officers recommend the replication of the CBESWMP project to the other barangays within their City/Municipality. However, they suggested several improvements in the design of the project (Table 21).

Table 21. Suggestions by City/Municipal LGU Solid Waste Management Offices to Improve Project Design and Implementation

City/Municipality	Suggestions to Improve Project Design
Paranaque	• Deputize enforcers and strictly enforce the law through issuance of violation ticket.
Manila	• Support barangays in community organizing.
Caloocan	• Close monitoring of the implementation of RA 9003 by barangay LGUs
Quezon City	• Waste analysis and characterization studies should be done by the barangays. • Weigh bridge should be provided in the disposal facility. • Data base development and design. • Establishing of standards and methods of computing diversion rate (e.g., formula for the computation of diversion rate).
Malabon	• No suggestion.
Las Pinas	• Require junkshops to participate in the collection of recyclables by providing pushcarts and ecobikes. • Employ ecoboys to gather recyclables.
Pasig	• Mobilize champions or leaders in the community to lead ecological solid waste management.
Navotas	• Deputize volunteer NGOs as environmental police. • Intensify information drive directed to non-compliants.
Makati	• Flexibility in MRF design. MRFs do not have to be buildings; they can be vans or ecocenters where recyclables can be stored. • Regular monitoring and assessment (quarterly) of project sites to sustain efficient operations.
Muntinlupa	• No suggestion

The NSWMCS recommends the following actions in the replication of CBESWMP:

- 1) CBESWMP replication in areas outside of Metro Manila, which are also having serious problems on waste disposal.
- 2) Establish Ecocenters at the regional and provincial levels, which will assist municipal and barangay LGUs in the implementation of CBESWMP.
- 3) Target school children for their value formation on SWM. Also mobilize them in implementing waste segregation and waste recycling.

4.2.10 Applicability and Usefulness of the Project Monitoring and Evaluation System and IEC

Most of the pilot barangays find the M&E system developed by the project to be useful in tracking down the volume of recyclable materials (Table 22). They also find the forms relatively easy to fill-out. The completed forms are submitted to PMO and to their City/Municipal SWM offices.

Of the 11 barangays, 7 barangays are able to comply with the requirement of the project to submit computer-processed M&E forms (Table 22). The 4 barangays are not readily able to comply and instead submit manually-processed forms. There were two major reasons why these barangays were not able to submit computer-processed form: 1) lack of computer literacy; and 2) malfunctioning computer. There

are now efforts among these barangays to submit computerized forms for their M&E reports. The PMO has also extended assistance to fix their computers and software.

Table 22. Usefulness and Compliance to M&E System of the Project

Barangay	Usefulness Rating	Compliance
Bgy. Sto. Nino	9	Computer-processed forms submitted monthly
Bgy. 598	8	Manual reports submitted monthly
Bgy. 52	2	Manual report submitted monthly
Bgy. 56	10	Computer-processed forms submitted monthly
Bgy. VASRA	NR	Manual reports submitted monthly?
Bgy. Niugan	10	Computer-processed forms submitted monthly
Bgy. Pilar	NR	Computer-processed forms submitted monthly
Bgy. Rosario	8	Manual reports submitted monthly
Bgy. Tanza	8	Computer-processed forms submitted monthly
Bgy. COMEMBO	8	Computer-processed forms submitted monthly
Bgy. Tunasan	8	Computer-processed forms submitted monthly
Average	7.88	

The project conducted IEC in the pilot barangays using several types of information materials. The types of the materials and the number of copies produced are given in Table 23.

The comics were mostly distributed to schools because they appeal to the school children. The RA 9003 posters were given to the barangay officials for posting in strategic places such as barangay hall and village stores. Likewise, the posters (Unified approach to SWM and Baha at Basura) and stickers (Paligid Ko Malinis sticker) on ESWM were disseminated to the barangays for display in conspicuous places. A large number of flyers on door-to-door garbage collection and “Mga Uri ng Recyclables” (types of wastes) was distributed to the barangays. Materials such as guidebook and ESWM video have very limited circulation for now.

Table 23. IEC Materials Produced by the Project

IEC Material	Number of Copies Printed
ESWM Guidebook on SWM Made Easy	5,000
Comics on Basura Kid	10,000
ESWM Video – long and short version	-
RA 9003 posters	5,000
Door-to-door Garbage Collection Flyers for MMDA	500,000
Unified Approach to SWM Posters for MMDA	16,000
Baha at Basura Posters for MMDA	560
Mga Uri ng Recyclables Flyers	16,000
Paligid Ko Malinis Na Sticker	3,000

Most of the respondents gave a high rating to RA 9003 poster and the door-to-door flyer (Table 23) in terms of their usefulness and effectiveness.

Table 23. Usefulness and Effectiveness of IEC Materials

Barangay	Rating of Usefulness and Effectiveness				
	Door-to-door Flyer	Paligid Ko Malinis Na Sticker	Magbukod-bukod Tayo Poster	Unified Approach to SWM	RA 9003 Poster
Bgy. Sto. Nino	9	9	NA	9	9
Bgy. 598	NA	8	8	NA	8
Bgy. 52	10	NA	3	NA	7
Bgy. 56	NR	NR	NR	NR	10
Bgy. VASRA	8	NR	NA	NR	8
Bgy. Niugan	8	8	8	NA	8
Bgy. Pilar	NR	NR	NR	NR	NR
Bgy. Rosario	5	7	8	10	10
Bgy. Tanza	8	NA	NA	8	10
Bgy. COMEMBO	NA	NR	NA	NA	10
Bgy. Tunasan	NA	NR	NR	NR	7

NR – no response

NA – not applicable. Pilot barangays did not receive information materials.

4.3 Lessons Learned

The replication of CBESWMP in other barangays will be able to attain a higher rate of success by taking a closer look at the experience of the project and the lessons that can be learned from it. It would be wise to consider the lessons learned from the implementation of the project in further improving the schemes adopted by the project.

4.3.1 Project Management and Coordination

- The **success of CBESWMP at the barangay level depends on the commitment and support of top management of NSWMCs, MMDA and City/Municipal LGU Executives**. Support should be given to all barangays regardless of the political affiliation of barangay leaders
- For future CBESWMP project that will be supported by international funding institutions, it is imperative that a special project financial management scheme be adopted by implementing agencies to facilitate approval and to effect timely releases of funds. **The handling of project funds should not be subsumed under the agency's regular accounting and financial processing system to avoid too much bureaucracy that oftentimes slow down project implementation.**
- To facilitate the implementation of CBESWMP, it would be much advantageous to **clearly define and delineate the roles and responsibilities of implementing agencies** such as the City LGUs, MMDA, NSWMCs, and private garbage collectors, civic organizations, NGOs and community organizations (e.g., homeowners association).

A MOA among the key actors should be drawn to clarify their responsibilities and at the same time get their commitment. **The MOA signing among the stakeholders should be done during the preliminary phase of project implementation to properly set the stage of collaboration.**

- **Barangays with very low compliance to segregation should be given priority for support** by City/Municipality in the construction or fabrication of MRF to generate a high level of return on investments (i.e., ensure high cost effectiveness). Due to limited funds, the City/Municipality has to employ a set of criteria for prioritizing barangays that will be given support in the construction of MRF and in the conduct of information and education campaign. One important criterion that should be given high rating is the present compliance rate in enforcing the segregation rule.

4.3.2 Community Organizing and Information Campaign

- **Social preparation and mobilization is critical to the successful implementation of CBESWMP.** It is a means to gain the trust, confidence and cooperation of the local community organizations and NGOs in the implementation of the project. It is the stage wherein champions and leaders are identified, mobilized and given support by the project.
- **The NGOs and local organizations play an important role in information dissemination and in keeping the environment clean.** They also keep the barangay officials on their toes in the implementation of CBESWMP and push them to move during periods when their efforts wane.
- **Improving the capability of barangay officials and SWM personnel on CBESWMP through training is a major step to equip them with adequate knowledge and skills and make them more effective agents of change** in their locality. At the same time, an intensive information drive directed at households is strategic in making them understand and appreciate the benefits of complying with RA 9003.
- **The comics is an effective medium in educating children and the general public.** Such information material should be widely disseminated to be able to reach out to as many stakeholders as possible. Copies of the comics are usually passed on to several readers and the printed material lasts for sometime, thus making it a good investment. The poster on RA 9003 was also reported by the stakeholders as effective in informing the local residents on RA 9003 particularly its punitive measures.

4.3.3 Waste Segregation

- **Segregation is difficult to implement without intensive IEC and strict enforcement of regulations.** All the pilot barangays encountered difficulties in making the residents comply with the rule on segregation. Some headway were made when non-complying households were identified, reprimanded and ultimately fined for their violations.

- **For the segregation campaign to be effective, the households should be educated on its economic and sanitation benefits.** Households are motivated to segregate when they learn that the recyclables command good prices from junkshops and will earn them income.
- The economic benefits of segregation should be stressed in tandem with the **strict enforcement of RA 9003's fine and penalty measures.** Many households comply with ESWM law for fear of being penalized but this only works when the households know that the barangay strictly enforces the law.
- **It is difficult to instill discipline among households to practice segregation if the garbage truck collectors do not implement the no collection no segregation rule.** If the households learn from experience that garbage dump truck collectors collect mixed wastes, they do not bother to segregate their wastes. Worst, if the garbage truck collectors collect garbage bags left on the sidewalks and streets, the residents will have no qualms in leaving their wastes outside their premises even during off-schedule for garbage truck collection.
- Mobilizing school children to segregate their households' wastes is an effective strategy to improve compliance rate to the segregation rule. **School children are proven to be effective agents to implement segregation.** Every barangay should therefore adopt this strategy.
- **A successful campaign in segregation is a key to achieving a high level of waste diversion.** Efforts to increase compliance rate of barangays to segregation have to be given impetus in CBESWMP to meet the objective of significantly reducing the volume of wastes disposed in dumpsites or sanitary landfills.

4.3.4 Site Selection, Construction and Operations of MRF

- The site for locating MRFs should preferably be near the barangay hall for close monitoring and supervision; and with safe distance or buffer space from residential houses to avoid complaints during their operations. **The MRF should be constructed in government-owned lands without encumbrances** such as existing land ownership claims from the private sector or individual persons.
- **Barangays without available space can opt for mobile MRF.** Other alternatives to MRF, which are also functional, include using junkshops as MRFs or establishing ecocenters in schools to store recyclables. Barangays with small population can form clusters and share a common MRF.
- **It is not always necessary to construct MRF buildings especially in barangays with small population and with limited available space.** Barangays with no available site for MRF buildings can tie up with junkshops and define their partnership and standard operations. The junkshops meeting the requirements and standards of the barangay can serve as MRFs.

- **MRFs should be maintained clean to avoid conflict with nearby residents.** There should be a processing area to clean recyclables and flatten plastics and cans, which is far from residential areas.
- **Efficient collection of recyclables is warranted to generate higher incomes from MRF operations.** Moreover, incomes from MRF necessitate proper accounting and budgeting to allow rationalized allocation to various expenditures items that would ensure the sustenance of its operations and maintenance of its cleanliness.

4.3.5 Garbage Collection

- The success of CBESWMP hinges on the support of City/Municipal SWMOs by ensuring efficient and adequate garbage collection. **Timely collection of garbage is a key to cleanliness and sanitation.**
- **In areas with narrow streets not accessible to dump trucks, ecoaides and street sweepers using pushcarts and ecotrikes play important role in the timely collection of wastes** and giving these to dump trucks in designated collection points. All barangays should adopt this scheme and systematize the procedures for the proper collection of garbage by ecoaides. Only accredited ecoaides, who are properly trained, should be allowed to collect wastes from households to avoid encroachment by unauthorized pushcart vendors.
- **For barangays located near creeks and rivers, more efficient and intensified garbage collection should be provided** by the City/Municipal LGUs. Such policy will greatly minimize the dumping of wastes into bodies of water which are now highly polluted.
- **Garbage of upstream barangays carried over by floodwaters spoil the cleanliness drive of downstream barangays.** Barangays 598, 56, Tanza, Niugan and Tunasan are perennially flooded and experience this problem because of their low elevation. The proper disposal and timely collection of garbage in upstream barangays will significantly reduce this problem. Priority should therefore be given to upstream barangays in the segregation of wastes, implementation of door-to-door collection scheme, and in the strict enforcement of laws and application of punitive measures to violators.

4.3.6 Monitoring and Enforcement

- **Tapping ecoaides or ecoenforcers to monitor and report on solid waste disposal violators is an effective way of minimizing violations.** By closely marking and monitoring households which are habitual violators and imposing fines and penalties on them in accordance with the law will certainly discourage other households in the neighborhood from doing the same illegal practices
- **Monitoring forms which are simple to fill-out even manually have better chance of being complied to and sustained by barangays.** In addition, the form should be able to capture the data requirements for computing waste diversion rate. Simplified and user-friendly monitoring forms can easily be

filled-out by ecoaides and barangay SWM officers who submit these reports to NSWMCS and the City/Municipal SWMOs.

- NGOs may serve as a conduit organization which are deputized by the barangays to monitor household compliance to segregation and to apprehend and file cases against violators. Under this scheme, the deputized **NGOs serve as effective organizations to impose fines and penalties without favor or political flavor** unlike the barangay officials who do not want to displease residents for fear of losing their votes come election time.
- **Reports on percent of recyclables collected in the barangay are most likely underestimated due to the leakages which are not properly accounted for.** The volume of recyclables collected by garbage trucks, scavengers and junkshop agents does not enter the record books of the barangay or the record books of the junkshops residing within the barangay.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The CBESWMP project was instrumental in **realizing the improved compliance of pilot barangays to RA 9003**. The **objectives of the projects were satisfactorily met** including the documentation of model CBESWMP and best practices. The project was able to accomplish all its major deliverables despite some management set-backs that stalled project implementation for several months.

The project's intervention strategies and actions paid-off well considering that **the pilot barangays posted an average of 42% waste diversion**, which is higher than the average of 28% attained by the ten (10) City/Municipal LGUs.

Several benefits were derived from the project, most importantly to wit: improving the capability of pilot barangays on SWM; increasing the number of households practicing segregation; reducing the volume of wastes disposed in dumpsites or landfills; improving the cleanliness and sanitary conditions of the locality's environment; and providing employment and income to ecoaides, street sweepers, garbage truck collectors and junkshop owners.

The CBESWMP system established under the project has **a high potential for replication in other barangays** because its implementation involves pragmatic ways and modest amount of investments from the City/Municipal and Barangay LGUs. However, community organizing and ESWM plan preparation would require assistance from NGOs and similar organizations which have the skills and experience for such types of undertakings. The barangays may then have to look for funds to engage the services of NGOs or academic institutions to assist them in community organizing and SWM plan preparation.

The **pilot barangays are confident that they can easily sustain the CBESWMP system and its project components** and activities such as information campaign, training, MRF operations, and monitoring inasmuch as they have developed the capacity to do so. However, the low-income barangays expressed their apprehensions regarding their financial capacity to fund MRF construction and their limited technical capability to conduct training.

Low compliance to segregation by local residents remains the bottleneck of the CBESWMP. Segregation is predicated on several interrelated factors for it to fairly succeed: economic motivation of households to recover recyclables; consistent enforcement of the punitive measures of the law; strict adherence by garbage

collectors on the “no segregation no collection rule”; and intensified drive to inform and educate local residents.

The construction of MRF buildings is a precursor to improving collection of recyclables and increasing waste diversion rate. For barangays with limited space and small population size, there are better alternatives to MRF buildings such as mobile MRFs made of container vans which occupy less space and cost less; use of junkshops as MRFs capitalizes on the experience and business skills of operators making them suitable partners; and harness unutilized or less utilized vacant spaces in schools as ecocenters for storage of recyclables.

The following are recommended to improve the design and implementation of CBESWMP when it is replicated in other barangays:

- The CBESWMP should give equal emphasis on the components comprising the whole cycle of solid waste management from waste minimization, source segregation, recycling and composting, collection and proper disposal. CBESWMP is not fully anchored on MRF although it is an important component and a requirement, which some barangays find difficulty complying with. **Other alternatives to the construction of MRF building should be fully explored and further studied in terms of their functionality, adaptability to local situation, and cost effectiveness.**
- To determine other viable options for the management and operations of MRF, those MRFs presently being managed and operated by cooperatives and junkshop owners should be evaluated. **The economic viability and sustainability of MRFs being managed and operated by cooperatives and junkshops should be compared with those operated by barangay LGUs to come out with model variants for MRF management and operations.**
- **Guidelines and accounting system on the use of the income from MRFs should likewise be formulated** and published to guide the barangays in the efficient and effective utilization of such income in supporting ESWM activities.
- When not properly managed, MRFs generate noise and odor pollution, pose as fire hazard, become breeding places for pests (rats, mice, cockroaches, flies) and obstruct sidewalks. **Operational guidelines to prevent these nuisances should be established jointly by NSWMCS, MMDA and the City/Municipal SWMOs.** It is also advisable to include in the Barangay's ESWM plan an initial assessment of the potential social and environmental impacts of sites selected for MRF. Maintaining the cleanliness of MRF is important to make ESWM system work and acceptable to the community.
- **Training of barangay ecoaides, out-of-school youth, and unemployed housewives on the design and crafting of house decors, fabrication of plastic tiles and production of ropes from recycled materials.** The skills training will promote livelihood activities and add more economic value to finished products using recycled materials.
- The IEC campaign materials (e.g., printed and video materials) should not only focus on giving target audiences information about CBESWMP within the context of RA 9003 but should also be able to stir emotions to effectively change behavior and attitude. **The IEC materials should emphasize on the**

economic and environmental benefits of segregation and the penalties of violating RA 9003. The approach should lean strongly towards marketing an advocacy stance rather than just informing people what should be done.

- **The door-to-door scheme of garbage collection should strengthen its campaign on segregation.** Non-collection of unsegregated wastes should be strictly enforced, and to maintain cleanliness of the surroundings, garbage should be kept inside the households' property line before they are collected to avoid their spillage on the sidewalks and streets.
- Educating and mobilizing school children is an effective means of improving the level of recycling and waste diversion in the barangay. School children should be taught how to segregate recyclables and to give these to their school or barangay MRFs. Thus, **the involvement of the school children should be made a regular component in the design and implementation of CBESWMP.**
- **The LGUs – SWMOs and the barangays should establish closer coordination through the creation of a joint monitoring team to oversee the timely and orderly collection of garbage by the dump trucks.** The monitoring system should be formalized to clearly establish roles and responsibilities as well as implementation procedures to avoid confusion and redundancies in tasking.
- **Composting should be encouraged in areas where adequate space is available.** Making composting mandatory in crowded and highly built-up barangays is impractical. Instead, backyard composting should be promoted in barangays which lack space. Plant pots and large container drums can be used by households for their backyard composting.
- **One of the considerations for replication is to educate the households on what types of wastes are toxic and hazardous so that they can properly segregate them.** The LGUs should dedicate one truck for the collection of toxic and hazardous waste to easily monitor their volume and ensure that they are disposed in designated locations or treatment sites.
- **The city/municipality should fully implement the financial incentives given to barangays on the basis of their waste diversion rate or equivalent amount of savings they incur as a result of the number of truck-trips avoided.** They should also support the barangays in setting-up their system of issuing violation tickets and in strengthening their system of monitoring compliance of households to segregation.

Other more specific recommendations are provided in the main text of this report.

