

**MINISTRY OF HOUSING AND LOCAL GOVERNMENT
MALAYSIA**

**THE STUDY ON
NATIONAL WASTE MINIMISATION
IN MALAYSIA**

FINAL REPORT

**Volume III
Pilot Projects**

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Final Report

FINAL REPORT COMPOSITION

The Final Report is composed of the following:

1. Summary
2. Volume I – Main Report
3. Volume II – Guidelines
4. **Volume III – Pilot Projects**
5. Supporting Report – 1 Additional Information
6. Supporting Report – 2 Local Action Plans

This Report is “Volume III - Pilot Projects”.

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Appendix 11: Eco Pack in Miri; “3R for a Better Tomorrow”

Abbreviations

AFSB	Alam Flora Sdn Bhd
A/P	Action Plan
CBO	Community Based Organisation
C/P	Counterpart
DB	Dewan Bandaraya (City Hall)
DBKL	Dewan Bandaraya Kuala Lumpur (Kuala Lumpur City Hall)
DBKU	Dewan Bandaraya Kuching Utara (Kuching North City Hall)
DSWM	Division of Solid Waste Management
EPU	Economic Planning Unit
G3RS	Guidelines for Enhancement of 3Rs Activities in School
IEC	Information, Education and Communication
IMS	Information Management System
JICA	Japan International Cooperation Agency
LA	Local Authority
LAP	Local Action Plan
LAP-WM	Local Action Plan on Waste Minimisation
LGD	Local Government Department
MB	Majlis Bandaraya (City Council)
MBJB	Majlis Bandaraya Johor Bahru (Johor Bahru City Council)
MBKS	Majlis Bandaraya Kuching Selatan (Kuching South City Council)
MBM	Majlis Bandaraya Miri (Miri City Council)
MBMB	Majlis Bandaraya Melaka Bersejarah (Melaka City Council)
MD	Majlis Daerah (District Council)
MDK	Majlis Daerah Kerian
MDKS	Majlis Daerah Kinta Selatan (South Kinta District Council)
MHLG	Ministry of Housing and Local Government
MIDA	Malaysian Industrial Development Authority
MITI	Ministry of International Trade and Industry
MOE	Ministry of Education
MONRE	Ministry of Natural Resources and Environment
MP	Majlis Pernadaran (Municipal Council)
M/P	Master Plan
MPK	Majlis Perbandaran Kuantan (Kuantan Municipal Council)
MPPP	Majlis Perbandaran Pulau Pinang (Pulau Pinang Municipal Council)
MPPJ	Majlis Perbandaran Petaling Jaya (Petaling Jaya Municipal Council)
MPSJ	Majlis Perbandaran Subang Jaya (Subang Jaya Municipal Council)
MSW	Municipal Solid Waste
NCP3R	National Children's Programme on 3R
NGO	Non Governmental Organisation
NRD	National Recycling Day
NRP	National Recycling Programme
NSP	National Strategic Plan on Solid Waste Management
OECD	Organisation for Economic Co-operation and Development
OPP3	Third Outline Perspective Plan
PDM	Project Design Matrix
PP	Pilot Project
PR	Public Relations
PWD	Public Works Department
RA	Residents Associations
R&D	Research and Development
RIC	Recycling Information Centre

RM-8	Eighth Malaysian Plan
RM-9	Ninth Malaysian Plan
RNU	Recycling Networking Unit
SND	Stakeholders' Networking Database
SS	Source Separation
SW	Solid Waste
SWM	Solid Waste Management
SWMA	Solid Waste Management Act
SWMD	Solid Waste Management Department
SWMSB	Southern Waste Management Sdn Bhd
TWG	Technical Working Group
WM	Waste Minimisation
WMU	Waste Minimisation Unit
WM-M/P	Waste Minimisation Master Plan
3RAG	3Rs Action Guide

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background

In August 2005, the government officially approved the *National Strategic Plan for Solid Waste Management*, a document that sets the framework for the overall management of solid waste in Peninsular Malaysia for the next 15 years. To achieve waste minimisation and sustainable development, the National Strategic Plan through its “Action Plan for Implementation” identified a number of tasks that need to be implemented, amongst which include the enhancement of public awareness and participation in waste minimisation, strengthening stakeholders’ partnership in waste reduction, reuse and recycling, capacity development of the government and establishing a national waste database.

Consequent to the recommendations of the National Strategic Plan, JICA initiated a study in 2005 to develop a Waste Minimisation Master Plan and Federal Action Plan and a set of guidelines to promote and sustain waste minimisation at the federal and local authority level.

In conjunction with the Waste Minimisation Master Plan and Action Plan, three pilot projects were conducted over a 6-month period in the second half of 2005 to demonstrate and test key recommendations of the plans; and inversely, to receive feedback on the applicability and appropriateness of these recommendations.

The relationship of the pilot projects with the strategies of the Master Plan and recommendations of the Action Plan (A/P) are shown in Table 1.1.1 and in Figure 1.1.1.

Table 1.1.1 Relationship between Master Plan, Action Plan and Pilot Projects

Master Plan Strategies	Components of the Action Plan	Pilot Project
1. Enhancement of Awareness on Waste Minimisation	Action 1: Enhancement of Awareness Raising Activities under the National Recycling Programme (NRP)	PP-I
	Action 2: Enhancement of 3Rs Activities in Schools	PP-II&III
2. Strengthening of Partnership for 3Rs Activities	Action 3: Formulation of Stakeholders’ Networking and Development of Partnership Activities of NGOs/CBOs	PP-II
3. Enhancement of Institution to Strengthen Government Policies on Waste Minimisation	Action 4: Strengthening of Legal, Regulatory and Financial Mechanism Action 5: Improvement of Information Management Action 6: Provision of Guidance to LAs on LAP-WM	PP-I&II

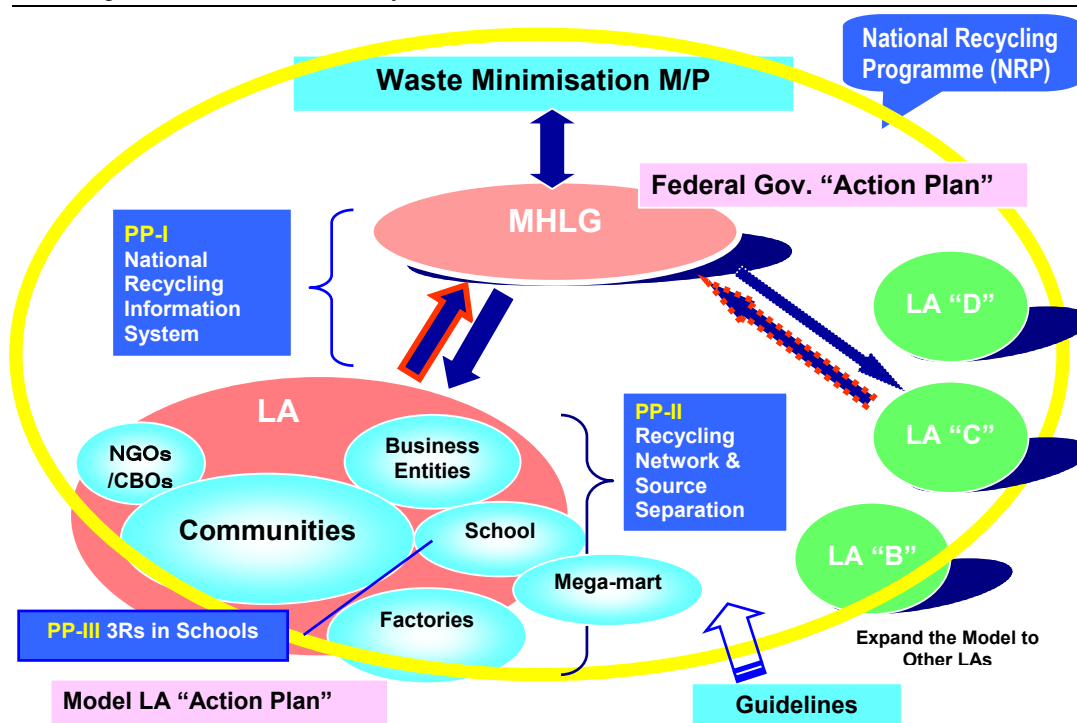


Figure 1.1.1 Conceptual Diagrams of the Action Plan Components and Pilot Projects

1.2 Objectives of Pilot Projects

The first pilot project (PP-I) pertains to the establishment of a National Recycling Information System at the Health and Environment Engineering Division of the Ministry of Housing and Local Government (MHLG). The objective of this pilot project is to set up a recycling networking unit, a data and information management system, and capacity building at the national level.

The second pilot project (PP-II) involves the setting up of a recycling network and intensification of source separation at the local level. The objective is to assist the local government to develop a local waste minimisation unit within its own organisation to manage a waste data and information system, promote 3Rs awareness and waste minimisation activities in areas within its administrative jurisdiction, to set up a network amongst the stakeholders in the waste scene, and to train local personnel.

The third pilot project (PP-III) involves the development of a set of guidelines to enhance 3Rs activities in schools, assist schools to initiate an awareness programme and sustain an active minimisation programme.

The pilot projects, their objectives and target groups are summarised in Table 1.2.1.

Table 1.2.1 Pilot Projects and Target Groups

PP	Project Objective	Target Groups
PP-I	Establishment of National Recycling Information System	MHLG, LAs
PP-II	Local Recycling Networks and Source Separation of MSW	LAs, NGOs, CBOs, RAs, Institutions, Religious Organisations, Schools, etc.
PP-III	Enhancement of School Activities on 3Rs	Primary and secondary students and teachers, Parents, PTAs,

CHAPTER 2

SELECTION OF PILOT PROJECTS

CHAPTER 2 SELECTION OF PILOT PROJECT

To be consistent with the objectives and targets of the A/P, it is imperative that the activities of the pilot projects (PP) include, amongst others, activities related to capacity development, awareness promotions on 3Rs, establishment and enhancement of the networking system, and physical activities towards waste minimisation. It is equally critical that the target groups cover a wide spectrum of stakeholders from the federal to the local level and selected from both the public and private sectors of the community.

At the initial stage of the Study, JICA Study Team (JST) together with MHLG conducted a number of information gathering visits and meetings with some of the stakeholders, i.e., LAs, NGOs, CBOs, associations, organisations and private companies. At these meetings, the stakeholders were requested to submit an outline of their proposal and ideas for the PP that is related to their scope of services or activities. At the same time, JST also prepared some outline concepts for the PP based on lessons and issues learnt during the interviews, and also with experience gained from Japanese 3R activities.

Similar to the selection procedure for the Model LAs, the PP target groups, project components, selection criteria and evaluation methods were presented to participants at the 1st Training Workshop held at INTAN, Kuala Lumpur on December 23rd, 2004. The proposed selection system was discussed and mutually agreed in principle to be adopted for the PP selection process.

The PP target groups, components and selection criteria were also presented to the Technical Working Group (TWG) Meeting that was chaired by MHLG on December 24th, 2004. It was mutually agreed during the meeting to accept, in principle, the proposed components and selection criteria for the PPs.

The selection process is briefly described in the flow diagram as shown in Figure 2.1.1.

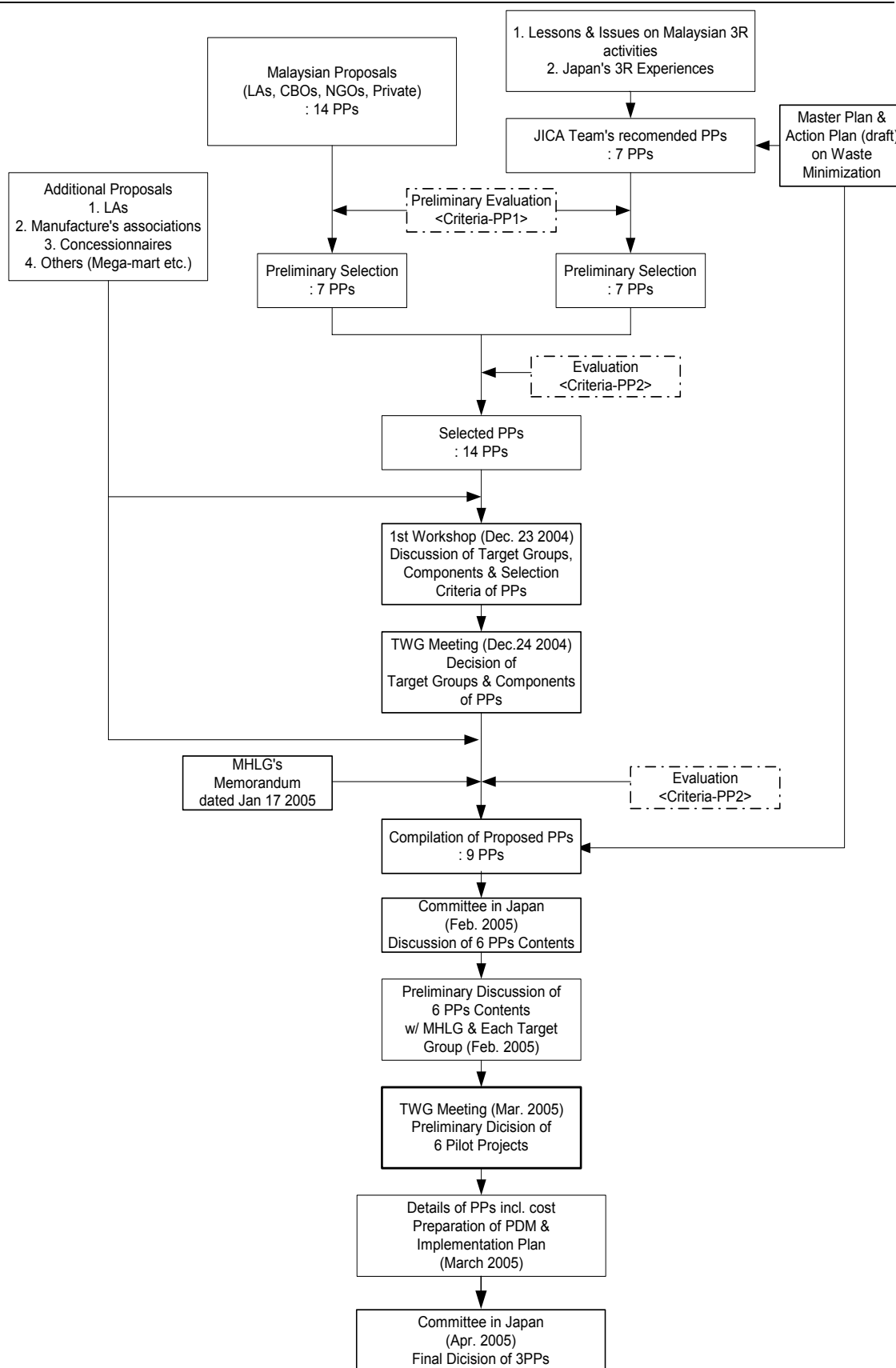


Figure 2.1.1 Flow Diagram of Selection of Pilot Project

2.1 Target Groups and Project Components

Encouraging participation both from institutional players and service users is essential to the success of the *Waste Minimisation Master Plan (WM-M/P)* and *Action Plan (A/P)*. People should be fully involved in issues concerning themselves and the community in which they live. In addition, effectiveness and sustainability depend at least partly on the commitment of all interested parties, (stakeholders), be they powerful or important to the planning process. Thus, broad participation is a central element in achieving the objectives of the WM-M/P and A/P.

Based on consultation with and agreement from MHLG, the target groups selected to participate in the PPs and the specific components of the PPs selected are as follows.

(1) PP for the Federal Government (MHLG)

It was generally agreed with MHLG that the PP at the federal level includes activities that are in-line with the National Recycling Programme, a programme initiated by MHLG and which they intend to intensify in order to strengthen its role in instilling public awareness in waste minimisation, form a stronger partnership with stakeholders and develop the capability of its human resources.

Arising from MHLG's requirements and needs, the components for the PP at the federal level include the setting up a Recycling Networking Unit and an Information Management System within the Health and Environmental Engineering Division of MHLG. The purpose is to set up a stakeholders' networking database, manage data and information from the LAs, conduct 3Rs awareness campaigns and disseminate information.

(2) PP for Model Local Authorities

According to the findings of the National Strategic Plan, more than 80% of the waste disposed at the landfills is household waste. MHLG and JST are fully aware that to achieve sustainable development in the country in the long term, waste minimisation efforts must start from the ground, that is, at the local level. Given the current state of low awareness and participation level of the general public in waste minimisation programme in most LA areas, the study identified a number of key components to be implemented in the PP involving the LAs. These components include:

- a) The setting up of a local networking of stakeholders and data management system to be managed by a unit within the LA.
- b) Introduction or intensification of source separation at households.
- c) Supporting recycling projects conducted by NGOs.
- d) Promotion of awareness programmes on waste minimisation in schools.

(3) PP for SMIs and Retail Establishments

Industries and businesses also produce waste, and these sectors can become significant players in the waste management system, particularly when these establishments must pay directly for their waste service.

The two key components identified to be implemented in the PP involving industrial and retail establishments include:

- a) Supporting and promotion of recycling activities in offices.

- b) Enhancement of waste minimisation in SMIs (Small & Medium Industries) and mega-marts.

2.2 Selection of Pilot Projects

In February 2005, various parties that include MHLG, LAs, JST, NGOs, CBOs and the private sector proposed a total of 24 PPs.

(1) Preliminary Evaluation and Selection

Based on Selection Criteria 1 listed below, a preliminary evaluation exercise was carried out. The initial list of 24 PPs was shortlisted to 14, i.e. 7 from the stakeholders and 7 from the JST. The lists of PPs are tabulated in Table 2.2.1 and Table 2.2.2 respectively.

Selection Criteria 1 for Preliminary Evaluation of Pilot Projects:

- a. The proposed activities are to be in line with the 3R activities and/or JICA Study on Waste Minimisation.*
- b. The target waste types are to be limited to municipal solid waste (MSW) and/or non-hazardous (and non-scheduled) waste.*
- c. Feasibility and timescale of the pilot project.*

(2) Secondary Evaluation and Selection

From the preliminary evaluation, the 14 shortlisted PPs went through a secondary evaluation process based on Selection Criteria 2 to further shortlist to number of potential pilot projects to 9.

Selection Criteria 2 for Preliminary Evaluation of Pilot Projects:

- a. The target group for the PP is to be one of the following:*
 - Federal Government (MHLG)*
 - Model LAs (incl. NGOs/ CBOs, private companies, etc.)*
 - Industry (Industrial Associations)*
 - Mega mart*
- b. The target waste types are to focus on the following recyclable items:*
 - Paper*
 - Plastics*
 - Metals*
 - Glass*
- c. The PP activities are to be in line with the National Recycling Programme.*
- d. The PP activities are to include one or more of the following components:*
 - Data / information management*
 - Networking of stakeholders*
 - The practice of source separation*
 - Promotions of education and public awareness in recycling*
 - Support stakeholders in recycling activities (i.e. NGOs, CBOs, RA, etc)*
- e. The PP activities are to be sustainable, i.e. continued by the stakeholders beyond the PP implementation period.*
- f. The PP activities are to be replicable, i.e. easily applied and implemented at other LAs and / or by other stakeholders.*
- g. The willingness of the recommending stakeholder to manage the PP activities, i.e. capacity of the supporting organisation to conduct the PP.*
- h. Budget of the PP*

Table 2.2.1 Pilot Projects Summary Proposed by the Malaysian Stakeholders

NO.	PILOT PROJECT PROPOSAL	CONTENTS	ORIGINATOR	LEAD AGENCY	CONCESSION AREA	PROJECT TYPE	PARTICIPANTS	TARGET BENEFICIARY GROUP	OUTPUTS
1	Petaling Jaya Demonstration and Documentation Centre on Waste Minimisation	To extend the existing recycling programme & to set up a Demonstration & Documentation Center (DDC).	MPPJ	LA	Central	PA & PE INFO	MPPJ (& LA21) Residents Assoc. Alam Flora Recyclers Shopowners	Fed G State G MPPJ Alam Flora Public	1. Demonstration & Documentation Centre (can replicate in other LAs) 2. Capacity to convert waste to handicrafts (value-added). 3. Information materials. 4. Increased awareness 5. Reduce waste generation.
2	3R Award For Primary And Secondary Schools In Miri Division	Seminar, workshop for primary & secondary schools, study visit to Recycling Facility in Kuching & prizes.	MP Miri	LA	Sarawak	PA & PE	MMC/LA21 Primary & Secondary Schools	Schools Fed G State G/LA LA21 Public	1. Award programme. 2. Increased Awareness
3	Penang Island Waste Minimisation & Waste Separation at Source Programme	To extend the existing 3Rs awareness programme & E-waste disposal and encourage separation at source.	MPPP	LA	Northern	WSAS PA & PE	MPPP Community SERI Recyclers Public	LA/State G Fed G MPPJ Business Industry Public	1. A LA-led Waste Minimisation Programme (can replicate in other LAs). 2. An improved recyclable collection system. 3. Information materials. 4. Database on recyclable generation & collection 5. Reduce waste generation.
4	Waste Minimisation & Recycling by Community-based Management	To extend existing programme & to promote segregation at source.	BSDRA	CBO	Central	WSAS PA & PE	Residents Assoc (RA) Alam Flora MPPJ Recyclers	Fed G RA Alam Flora Recyclers	1. A CBO-based Waste Minimisation Programme (can replicate in other LAs) 2. An improved recyclable collection system. 3. Information materials. 4. Improved database on recyclable generation & collection
5	Promoting Waste Minimisation in Small and Medium-scaled Industries (SMIs)	Survey of 50 SMIs & selection of 5 Pilot Projects for waste minimisation programme.	SERI	NGO	Northern	WSAS PA & PE	SERI SMIs SMIDEC FMM MPPP MPSP DOE USM?	SMIs Fed G State G. SERI	1. A Database of waste/recyclable generation. 2. 5 Waste Minimisation Programmes for Selected Industries. 3. Knowledge workers at SMIs. 4. Information & training materials (can replicate in other LAs).
6	National Recycling Information System & Information Centre	To design & set up an information system containing information on recycling for stakeholders. To set up Recycling Network Centre.	JICA Local Study Team	MHLG	NA	WSAS PA & PE	MHLG LAs FMM Ind Assoc. NGOs/ CBOs	Fed G. State G. LAs Other Fed. Agencies CBOs/NGOs Industry	1. A Database of waste/recyclable generation. 2. Establishment of data management unit in MHLG 3. Publication of 3R related information 4. Information & training materials (can replicate in other LAs).
7	Waste Minimisation in a Shopping Complex/Megamall	To promote waste minimisation among tenants & consumers.	JICA Local Study Team	Megamart	NA	WSAS PA & PE	Megamart Admin. Tenants Shoppers LA/Concessionaire Recyclers Suppliers of "green products"	Commercial Retailers Fed G. State G. LAs Recyclers Consumers	1. A Database of waste/recyclable generation. 2. Reduce waste for landfill 3. Waste Minimisation Programmes for Selected Retailers 4. Wise Buying by Consumers. 5. Information & training materials (can replicate in other shopping areas).

Notes: WSAS: Waste Separation at Source, INFO: Information Mgt., PA&PE : Public Awareness & Education, FACILITY: Facility Establishment

Table 2.2.2 Pilot Projects Summary Proposed by the JST

NO.	PILOT PROJECT PROPOSAL	CONTENTS	ORIGINATOR	LEAD AGENCY	CONCESSION AREA	PROJECT TYPE	PARTICIPANTS	TARGET GROUP/BENEFICIARY	OUTPUTS
1	Source Separation of Municipal Waste	To extend the existing recycling programme & to encourage separation at source into 4 waste groups: general waste (non-resource), household hazardous waste, bulky waste & resource waste.	JICA Study Team	LA	NA	WSAS FACILITY PA & PE INFO	LA Residents Assoc Concessionaire/contractors Recyclers	LA Residents Fed G. State G. Landfill operator Public	1. A LA-led Waste Minimisation Programme (can replicate in other LAs). 2. An improved recyclable collection system. 3. Information materials. 4. Database on recyclable generation & collection 5. Reduce waste generation.
2	Establishment and Implementation of Recycling Network for Local Authorities	To extend an existing recycling programme & to establish a Recycling Network.	JICA Study Team	LA	NA	WSAS FACILITY PA & PE INFO	LA Residents Assoc. Concessionaire/contractors Recyclers	LA Residents Fed G. State G. Landfill operator Public	1. A LA-led Improved Waste Minimisation Programme (can replicate in other LAs). 2. Recycling network 3. Knowledge workers at LA 4. Information materials. 5. Database on recyclable generation & collection 6. Reduce waste generation.
3	Waste Minimisation and Recycling by Community-based Management	To establish a CBO-led recycling programme & to encourage separation at source in a community comprising the 4 main ethnic groups.	JICA Study Team	CBO	NA	WSAS FACILITY PA & PE INFO	CBO LA Residents Assoc. Concessionaire/contractors Recyclers	CBO LA Residents Fed G. State G. Recyclers Landfill operator Public	1. A CBO-based Waste Minimisation Programme (can replicate in other LAs) 2. An improved recyclable collection system. 3. Information materials. 4. Improved database on recyclable generation & collection
4	Implementation of Separating and Collecting Resources in an Industrial Estate	To establish or improve waste minimisation among factories in an Industrial Estate. To examine resource diversion among the factories.	JICA Study Team	Factories	NA	WSAS FACILITY PA & PE INFO	Industries FMM /appropriate association LA DOE	Factories Fed G. State G. Recyclers	1. A Database of waste/recyclable generation & composition. 2. Model 3Rs Programmes for Selected Industries. 3. Knowledge factory workers. 4. Directory of Waste Generators & Takers (Re-processing).
5	Enhancement of Minimisation and Recycling in Megamart	To promote waste minimisation & recycling of packaging.	JICA Study Team	Megamart	NA	WSAS FACILITY PA & PE INFO	Megamart LA Recyclers	Business/Commerce Fed G. State G./LA Public	1. Award programme. 2. Increased Awareness
6	Recycling Activities and Waste Minimisation Education in Schools	To implement recycling activities by pupils and enhance awareness.	JICA Study Team	LA	NA	WSAS FACILITY PA & PE INFO	Min of Education Primary & Secondary Schools Media LA/Concessionaire	Schools LA/State G. Fed G. Recyclers Public	1. A LA-led Waste Minimisation Programme (can replicate in other LAs). 2. Information materials. 3. Database on recyclable generation & collection 4. Reduce waste generation.
7	Waste Minimisation Campaign at Religious Facilities (mosques, churches & temples)	To promote recycling & segregation at source as part of clean & healthy lifestyle.	JICA Study Team	Religious Facilities	NA	WSAS FACILITY PA & PE	Religious Facilities Residents Assoc.(RA) LA/Concessionaire Recyclers	Religious Facilities Fed G./State G. LA RA Recyclers	1. A CBO-led Waste Minimisation Programme (can replicate in other communities) 2. An improved recyclable collection system. 3. Information materials.

Notes: WSAS: Waste Separation at Source, INFO: Information Mgt., FACILITY: Facility Establishment

(3) Final Selection of the Pilot Projects

On 17th January 2005, a memorandum was received from MHLG requesting the inclusion of an additional PP for consideration. The proposal was to carry out composting of biodegradable waste from hotels, working in collaboration with a local university that is already conducting the composting study. The recommended PP was received by JST and included for evaluation.

Based on the final evaluation exercise, 9 PPs were short-listed and tabulated as shown in Table 2.2.3. The short-listed PPs were presented to the JICA Advisory Committee in Japan in February 2005 for discussion and approval of the proposed concepts. Based on the results of the discussions and recommendations, it was subsequently decided that amongst the 9 proposed PPs, 6 PPs be recommended for implementation due to technical, time and financial constraints. The two PPs that were omitted (PP-F and PP-I) require the procurement of high-cost and long lead-time machinery, and hence are not feasible under the PP time frame and scope of work.

The 6 PPs that were recommended for implementation are shown in Table 2.2.3.

Table 2.2.3 List of Proposed Pilot Projects

PPs	Title of Pilot Projects	Target Group	Decision
PP-A	National Recycling Information System	MHLG	Selected
PP-B	Establishment of Recycling Network in LAs	4 Model LAs	Selected
PP-C	Source Separation of Municipal Waste	4 Model LAs	Selected
PP-D	Waste Minimisation in Small-Medium Industries	SMI (Penang)	Selected
PP-E	3R Activities in Primary & Secondary Schools	Schools (Miri)	Selected
PP-F	Establishment of Waste Minimisation/Recycling System	SWMSB (J.B.)	Not selected
PP-G	PET, Bottles, Cans & Glass Bottles Recycling	Associations	Not selected
PP-H	Waste Minimisation/ Recycling in Mega-mart	Mega-mart	Selected
PP-I	Composting in Hotel and University	Hotel/ Univ.	Not selected

During the third field study in Malaysia in February 2005, JST presented the merits and implementation plans of the 6 PPs and discussed the individual components and target groups with MHLG.

The methodology used in the evaluation of the 6 PPs and conceptual scope of work was also presented to the Technical Working Group (TWG) meeting on March 9, 2005. It was mutually agreed, in principle, during the meeting to accept the concept of the proposed 6 PPs and the proposed target groups.

After the TWG meeting, JST and MHLG continued to discuss details of the PPs with each target group. At the discussion with the target groups, it was highlighted that the support from the mega-mart in PP-H might not be forthcoming. This feedback was subsequently reported to MHLG and the JICA headquarters. The advice and final decision from both parties was to exclude PP-H as a PP.

Moreover, because of the following reasons, it was finally decided that PP-B and C in MD Kinta Selatan (MDKS) and PP-D will not be implemented in Phase II of the Study.

1) PP-B and C in MDKS

- In case of district council such as MDKS, coordination with nearby city council is necessary in order to establish a sustainable recycling network. Because number of recyclers/end-users in district council is limited.
- In MDKS, coordination with MP Ipoh was considered for the preparation of LA's A/P in the Phase II study.
- As described in Chapter 7, MDKS has selected as one of the model LAs at the latest moment of Phase I study, and preparation of LA's A/P including above two items and pilot project is not preceded yet.
- For Phase II study in MDKS, it is necessary to focus to prepare LA's A/P considering coordination with MP Ipoh.

2) PP-D

JICA carried out a development study on the cleaner production for industries in Malaysia in the year 2000, and this study included the PP-D's component.

Consequently, 4 PPs were selected and PP-B & PP-C were combined as one project. These were re-numbered and as shown in Table 2.2.4.

Table 2.2.4 List of Pilot Projects

Pilot Projects Numbering		Project Name
Former No.	Re-numbered	
PP-A	PP-I	Establishment of National Recycling Information System
PP-B	PP-II	Local Recycling Network and Source Separation of MSW
PP-C		
PP-E	PP- III	Enhancement of School Activities on 3Rs

CHAPTER 3

OUTLINE AND PROJECT DESIGN MATRIX (PDM) OF PILOT PROJECTS

CHAPTER 3 OUTLINE OF THE PILOT PROJECTS

3.1 Outlines of Pilot Projects

The outline of the selected PPs is shown in Table 3.1.1.

Table 3.1.1 Outline of Pilot Projects

PP	PP-I	PP-II	PP-III
Project Name	Establishment of National Recycling Information System	Local Recycling Network and Source Separation of MSW	Enhancement of School Activities on 3Rs
Project Area	Kuala Lumpur	MPPP, MPSJ, MBM	Johor State, MBM
Target Group	MHLG, 10 LAs	3 Model LAs	Primary & Secondary schools
Project Purpose	1. To serve as a base for 3Rs data accumulation and dissemination in Malaysia through the setting up of a Recycling Networking Unit (RNU) in MHLG. 2. To enhance the capacity of MHLG to monitor SWM & 3Rs activities at Federal level.	1. To encourage sustainable recycling through partnership of stakeholders. 2. To improve the capacity of LAs to monitor recycling activity. 3. To increase the collection amount of recyclable materials separated at source.	1. To enhance the awareness on 3Rs amongst students and teachers.
Outputs	1. Data management system on solid waste management & 3Rs in national level is established. 2. Recycling Networking Unit (RNU) is established in MHLG (tentative-base). 3. 3Rs related information is published by RNU. 4. Capacity of MHLG C/Ps is developed.	<Recycling Network> 1. Data management system on SWM & 3Rs in local level is established. 2. Waste Minimisation Unit (WMU) is established in LAs (tentative-base). 3. Recycling is carried out by stakeholders participated in PP. 4. 3Rs related information is published. 5. Capacity of LAs officials and regional 3Rs leaders are developed. <Source Separation> 1. Residents/ communities, etc carry out source separation. 2. Recycling route of recyclables (paper, glass, can and PET) is established. 3. Profit from selling recyclables return to communities/ institutions. 4. Awareness of communities/ residents for waste minimisation is enhanced.	1. 3Rs education programme/ material in school is prepared. 2. 3Rs activities awards programme in school is implemented. 3. Capacity of school teachers on 3Rs is developed.

3.2 Project Design Matrix (PDM) of the Pilot Projects

In order to conduct the PPs effectively, the Project Design Matrix (PDM) was prepared by the JICA Study Team for each programme in the planning stage of the PPs.

PDM contains the pilot projects' overall goal, project purpose, outputs, activities, and inputs, and shows the logical interrelationship among those components, as well as the important assumptions related to the PP. It also identifies the objectively verifiable indicators (OVIs) to monitor progress of the projects to ensure consistent management throughout the project cycle.

All the PPs undertaken in the Study were implemented based on the PDM. The PDM for each PP are shown in Table 3.2.1, Table 3.2.2, Table 3.2.3 and Table 3.2.4.

Table 3.2.1 PDM for PP-I

Project name: PP-I Establishment of National Recycling Information System
Target groups: MHLG
Duration: June to November 2005
Date: March 16 2005

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal 3Rs practices in Malaysia can be clarified by MHLG. Waste minimisation is enhanced nationwide.	1. Waste miniimisation/ recycling ratio (%) in Malaysia	1. Record of 3Rs related data/ information collected and analysed by MHLG.	
Project Purpose Recycling Networking Unit (RNU) in MHLG is established to function as a base of 3Rs data accumulation and disbursement in Malaysia. Capacity of MHLG to monitor SWM & 3Rs activities in Federal level is enhanced.	Number of LAs (incl. 4 model LAs) and other stakeholders submit the 3Rs format to RNU in MHLG.	Record of number of LAs and other stakeholders submitting the 3Rs format to RNU.	National Recycling Programme (NRP) does not terminate.
Outputs 1. Recycling Networking Unit (RNU) is established in MHLG (tentative-base). 2. Data management system on solid waste management & 3Rs at the national level is established. 3. 3Rs related information is published by RNU. 4. Capacity of MHLG C/Ps is developed.	1. Number of RNU staffs 2. Reporting forms on waste generation amount, 3Rs quantities data and 3Rs activity practices are prepared/ finalised. 3. No. of 3Rs related information brochures, directory booklets and education & awareness leaflets are published. 4. Number of staffs that participated in training workshop.	1. Organization chart of RNU 2. Reporting forms on waste generation amount, 3Rs quantities data and 3Rs activity practices. 3. Number of information brochures, directory booklets and education & awareness leaflets printed and distributed. 4. Attendance list of training workshop.	No. of LA pertaining to NRP doesn't decrease rapidly.
Activities 1-1 Procurement of equipment 2-1 Review and development of reporting format 2-2 Analysis of existing data 2-3 Develop new reporting procedures and forms 2-4 Establishment of MSW Information Management System 2-5 Explanation of IMS and new reporting format 2-6 Desktop testing / trials of IMS 3-1 Development of networking database 3-2 Update of stakeholders directory 3-3 Publication of 3Rs related information 4-1 Proposal for the future IT system of NRWIC 4-2 Conduct on-the-job training	Inputs [Japan] (1) Personnel 1) JICA team members: 3 responsible for Material flow, Public participation and pilot project 2) JICA local team members: 2 Expenditure/ Operation • Local consultant fee (3) Equipment: • Computer x2 units/ printer x2 units • Information management Software	[Malaysia] (1) Personnel 1) MHLG • C/Ps 2) Local authorities • Each model LA task-force • LA officials pertaining to NRP (2) Facilities • Space for Recycling Networking Unit in MHLG	RNU staffs continue to work Preconditions National Recycling Programme (NRP) will continue to be carried out.

Table 3.2.2 PDM for PP-II-1

Project name: PP-II (1/2) Establishment of Recycling Network in LAs
Project area: Penang, Subang Jaya and Miri

Duration: June to November 2005
Date: March 16 2005

Target groups: 3 Model LAs

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal Waste minimisation in LA is enhanced.	Waste minimisation/ recycling ratio (%) in LAs	Record of 3Rs related data and information collected and analysed by LAs and reported to MHLG.	
Project Purpose Sustainable recycling is carried out by the leadership of LAs. Capacity of LAs to monitor recycling activity is improved.	1. Frequency of reporting 3Rs practices to MHLG 2. No. of players to be monitored	1. Report to MHLG on 3Rs in line with National Recycling Programme (NRP) 2. Directory booklet of stakeholders	Market of recyclables does not rapidly decrease.
Outputs 1. Data management system on SWM & 3Rs at the local level is established. 2. Waste Minimisation Unit (WMU) is established in LAs (tentative-base). 3. Recycling is carried out by stakeholders that participated in PP. 4. 3Rs related information is published. 5. Capacity of LAs officials and regional 3Rs leaders are developed.	1. Waste generation amount, 3Rs quantity data and 3Rs activity practices. 2. Number of WMU staffs. 3. Type and amount of recyclables handled by each stakeholder that participated in PP. 4. Number of 3Rs related information brochures, directory booklets etc. that are published. 5. Number of LAs officials/ regional leader that participated in on-the-job training.	1. Reporting data to MHLG. 2. Establishment of WMU. 3. Record of recycling activities of participated stakeholders. 4. Number of information brochures, directory booklets printed/ distributed. 5. Record of Attendance list.	Number and types of 3Rs related stakeholders does not rapidly decreased.
Activities 1-1 Survey on present waste flow 1-2 Establishment of data collection, management and reporting system 1-3 Set up database of Stakeholders & 3Rs activities 1-4 Establishment and application of Recycling Networking System 2-1 Establishment of WMU 3-1 Conducting Stakeholders forum to clarify role of each player 4-1 Development of 3Rs awareness promotions 5-1 On-the-job training is carried out	Inputs [Japan] (1) Personnel 1) JICA team members: 3 members responsible for Material flow, Public participation and Pilot project 2) JICA local team members: 4 (one for each model LAs) (2) Expenditure/ Operation • Local consultant fee (3) Equipment • Computer x1 set, printer x 2 sets • Furniture (desk & chair x2 sets) • Office stationeries	[Malaysia] (1) Personnel 1) MHLG • C/Ps 2) Local authorities • Each model LA task-force (2) Facilities • Space for WMU in LAs	LAs officials continue to work. Players continue to practise recycling. Preconditions Each recycling player (NGO/CBO, recyclers, manufactures etc.) cooperate with this pilot project.

Table 3.2.3 PDM for PP-II-2

Project name: PP-II (2/2) Source Separation of Municipal Waste

Duration: June to November 2005

Project area: Penang, Subang Jaya and Miri

Target groups: 3 Model LAs

Date: March 16 2005

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal Municipal solid waste is reduced and recycled.	1. Waste minimisation/ recycling ratio (%) 2. Record of LAs activities on waste minimisation/ recycling.	Record of 3Rs related data/ information collected and analysed by LAs.	
Project Purpose Collection amount of recyclable materials separated at source increases.	Collection amount of separated waste at source	Record of source separation, discharge, collection, stall and selling.	Market of recyclables doesn't go down rapidly.
Outputs 1. Source separation is carried out by residents/ communities and business entities. 2. Recycling route of recyclables (paper, glass, can and PET) is established. 3. Profit from selling recyclables return to communities/ institutions. 4. Awareness of communities/ residents for waste minimisation/ recycling is enhanced.	1-1 No. of stakeholders participating in PP 1-2 frequency of source separation for each waste type. 2 Amount of source separated, discharged, collected and sold. 3 Amount of profit from selling recyclables and income of communities from it. 4 Number of residents participating in PR activities	1. Records of source separation. 2. Record of source separation, discharge, collection, stall and selling. 3. Record of recyclables sold and community's income from it. 4-1 Record of attendance list 4-2 No. of flyers/brochures/etc distributed to residents	Number and types of 3Rs related stakeholders do not rapidly decreased.
Activities 1-1 Selection of target area 1-2 Conducting explanatory meeting 1-3 Distribution of bins/ plastic bags 1-4 Setting up collection stations/ points 1-5 Source separation practice 2-1 Planning of source separation and collection route of collected recyclables 2-2 Conducting Stakeholders workshop 3-1 Planning of selling route of collected recyclables 4-1 PR activities are carried out 4-2 Implementation of questionnaire survey 4-2 On-the-job training	Inputs [Japan] (1) Personnel 1) JICA team members • Public participation expert • Expert on pilot project 2) JICA local team members: 4 personnel (one for each model LA) (2) Expenditure/ Operation • Local consultant fee (3) Equipment • Plastic bags/ bins • Containers • Collection vehicle (rental-base, if nec.)	[Malaysia] (1) Personnel 1) MHLG • C/Ps 2) Local authorities • Each model LA (task-force) (2) Facilities • Space for collection points (if necessary)	Separated recyclables are collected Preconditions Each player (residents/ communities, NGOs, institutions, collection Co., recyclers etc.) cooperate this pilot project.

Table 3.2.4 PDM for PP-III

Project name: PP-III 3Rs Activities in Primary & Secondary Schools

Target groups: Primary & Secondary Schools

Duration: June to November 2005

Date: March 16 2005

Project area: Miri, Johor

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal General public awareness on 3Rs is enhanced.	Waste minimisation/ recycling ratio (%)	Record of 3Rs related data/ information collected and analysed by MHLG	MHLG and LAs do not change the policy for 3Rs awareness promotion.
Project Purpose Awareness on 3Rs for students and teachers is enhanced.	1. Number of schools pertaining to 3Rs education programme 2. 3Rs activities/ awards programme.	1. Record of 3Rs education programme 2. Record of 3Rs activities/ awards programme	MHLG and LAs do not change the policy on environmental education and awareness.
Outputs 1. 3Rs education programme in school is implemented. 2. 3Rs activities awards programme in school is implemented. 3. Capacity of school teachers on 3Rs is developed.	1. Number of schools that introduce the 3Rs education programme 2. Number of schools that enter the 3R activities/ awards programme 3 Number of teachers that participate in workshop/seminar.	1. Implementation record of 3Rs education programme. 2. Entry record of 3Rs activities/ awards programme 3. Attendance list of workshop/seminar	Curriculum doesn't change drastically.
Activities 1-1 Development of Guidelines on Enhancement of 3Rs in schools 1-2 Conducting school teacher workshop 1-3 Conducting PP for guidelines 2-1 Development of PP 3Rs awards programme. 2-2 Selection of PP candidate schools. 2-3 Conducting explanatory meeting for participating schools 2-4 Implementation of 3Rs activities 2-5 Monitoring / Evaluation of 3Rs activities 2-6 Conducting Awarding ceremony 3-1 Conduct seminar/workshop	Inputs [Japan] (1) Personnel 1) JICA team members responsible for • Public participation • Pilot project 2) JICA local team members: 2 personnel (2) Expenditure/ Operation • Local consultant fee (3) Equipment • Weighing scales • Trophy, computer and other awards (3 nos.)	[Malaysia] (1) Personnel 1) MHLG • C/Ps 2) Local authorities • Miri, Johor • School teachers & PTA	Students continue to go to school. Trained teachers continue to work in schools. Preconditions Schools cooperate with this pilot project.

3.3 Evaluation Method of Pilot Projects

Based on the objectively verifiable indicators (OVIs) of the PDMs, the achievement level of project purpose and output of each PP was evaluated. PPs were further evaluated based on the indicators of the PDM, i.e., activities, outputs, project purpose and overall goal, prepared at the beginning of each PP, taking into account the key terms as shown in Table 3.3.1. (Source: Project Cycle Management (PCM) Methods, FACID 2000).

Table 3.3.1 Evaluation Criteria of Pilot Projects

Evaluation Criteria	Main Considerations
Efficiency	How can the amount of "activities" be cut back to produce the same "outputs"? Are the inputs being utilised properly to produce "outputs"?
Effectiveness	To what extent has the "project purpose" been achieved? Can the "project purpose" be achieved by the end of the cooperation period? Are there any "outputs" that need boosting to achieve the "project purpose"? Conversely, can any "outputs" be cut back without jeopardizing the achievement of the "project purpose"?
Impact	Is the project producing any negative effects? If so, how can they be minimised?
Relevance	Are "project purpose" and "overall goal" still compatible with the needs of the beneficiaries, priorities of the recipient country and the local social environment? If there are discrepancies, can any changes be made to the project to rectify them?
Sustainability	Are the implementing organisation, key implementation personnel and others on the recipient-country side developing technical expertise, operation/management skills and financial capability to carry on the project activities independently after the expiry of the cooperation period? To ensure self-reliance after the withdrawal of cooperation, what aspects of the project need to be strengthened in the remaining cooperation period and to what extent?

It must be clarified that the evaluation of the PPs focuses mainly on the effects the PPs have on the stakeholders, rather than how the projects were implemented - the objective being to ascertain the impacts and achievements of the PPs, make recommendations on the future course of the activities and options for other activities.

The relative importance of the evaluation criteria listed above differs for all indicators of PDM as shown in Table 3.3.2. For example, "Efficiency" is mainly evaluated based on outputs and activities, while "Effectiveness" focuses on project purpose and outputs. Sustainability is evaluated from overall goal to activities.

Table 3.3.2 Relationship between Evaluation Criteria and OVIs

Evaluation Criteria	Efficiency	Effectiveness	Impact	Relevance	Sustainability
Overall goal			What positive and negative effects, either direct or indirect, has the implementation of the pilot project had?	Are the "project purpose" and "overall goal" still meaningful as objectives at the time of evaluation?	To what extent will the recipient country's organisations be able to retain the positive effects of the pilot project after the withdrawal of cooperation?
Project Purpose		Whether the "project purpose" has been achieved, and how much contribution did "outputs" make?			
Outputs	To what extent have "inputs" been converted to "outputs"?				
Activities					

CHAPTER 4

IMPLEMENTATION FRAMEWORK OF PILOT PROJECTS

CHAPTER 4 IMPLEMENTATION FRAMEWORK OF PILOT PROJECTS

4.1 Basic Implementation Framework of the Pilot Projects

The PPs were carried out in collaboration with the taskforces and counterparts of MHLG, model local authorities, local consultants, JST and target groups including residents, NGOs, CBOs, schools, concessionaires, recyclers etc.

In all the pilot projects, the taskforces and counterparts from the Malaysian side were requested to take the lead, whilst local consultants and the JICA study team provided technical support. The know-how and technologies were transferred to the counterparts via the local consultants through the planning and implementation process for each pilot project.

The conceptual diagram of the implementation framework of the pilot projects is shown in Figure 4.1.1.

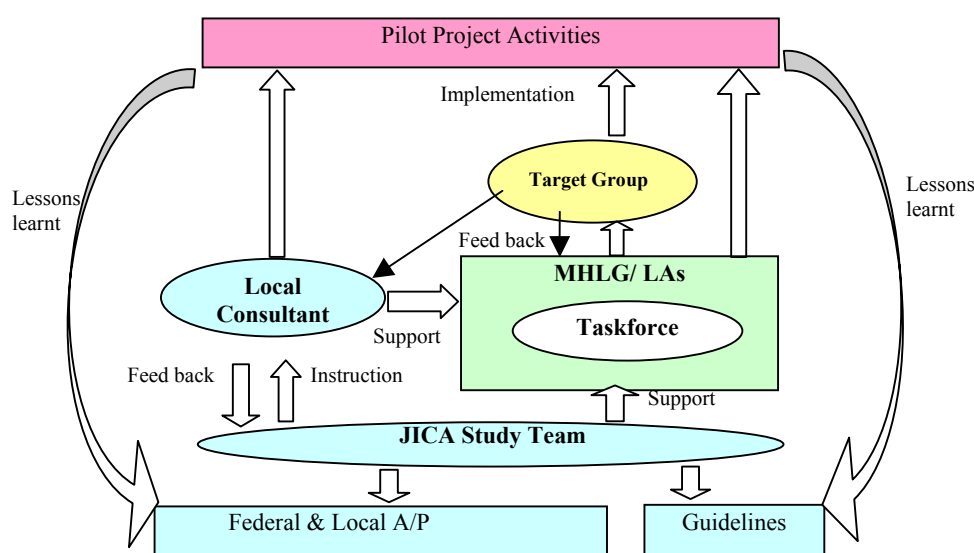


Figure 4.1.1 Implementation Framework of Pilot Projects I, II, III

4.2 Selected Local Consultants

In order to support the counterparts in implementation of the Pilot Projects, local consultants were selected as shown in Table 4.2.1.

Table 4.2.1 List of Local Consultants for the Pilot Projects

Pilot Projects	Target Group ¹	Selected Local Consultants	Activities Supported
PP-I	MHLG	MB Technology (M) Sdn Bhd	• Assistance to counterparts • Liaison with corresponding parties • Data input, analysis and compilation • Coordination for meetings with LAs • Preparation of new information management system
PP-II	MPPP	SERI	• Assistance to counterparts • Liaison with corresponding parties • Coordination and implementation of waste flow survey, briefings, stakeholder workshops, 3Rs campaigns • Coordination for formulation of networking • Coordination and implementation of source separation
	MPSJ	PE Research	
	MBM	Eco Ideal	
PP-III	MBM	Eco Ideal	• Assistance to counterparts • Liaison with corresponding parties • Coordination and implementation of school 3Rs activities and award programme • Support for adopting the guidelines for enhancement of 3Rs activities in schools
	MOE, Johor State Education Department	(JICA Study Team)	

Note 1: Ministry of Housing and Local Government (MHLG)
Ministry of Education (MOE)
Majlis Perbandaran Pulau Pinang (MPPP)
Majlis Perbandaran Subang Jaya (MPSJ)
Majlis Bandaraya Miri (MBM)

CHAPTER 5

PILOT PROJECT I: ESTABLISHMENT OF NATIONAL RECYCLING INFORMATION SYSTEM

CHAPTER 5 PP-I: ESTABLISHMENT OF NATIONAL RECYCLING INFORMATION SYSTEM

5.1 Background

To be line with the objectives of the National Recycling Programme (NRP), a programme initiated by MHLG to capture the recycling data and activities of the local authorities (LAs), the data and information available within MHLG needs to be systematically organised so that the data can be used to assess the state of the recycling programme within the country. Additional information such as stakeholders' contact details and related activities are also helpful in the setting up of the stakeholders' directory so that others may refer and network amongst themselves. Currently, the Recycling Unit under the Health and Environment Division of MHLG manages these data and information.

In the preliminary assessment of the NRP conducted by the JICA Study Team (JST) in June 2005, it was noted that systematic data and information management was lacking, and generally, information was not updated. Inadequate manpower and appropriate training of existing staff within the Recycling Unit could be one of the reasons for the absence of proper documentation of reports received from the LAs and database of LA and other stakeholder details. Arising from the preliminary assessment, JST proposed and implemented the Pilot Project for the "Establishment of National Recycling Information System" for MHLG. Codenamed PP-I, the project spanned a period of 5 months from July – November 2005, and involved the cooperation and collaboration of the Recycling Unit of MHLG and 10 LAs selected specifically for the project.

5.2 Outline of PP-I

5.2.1 Project Purpose

The primary purpose of PP-I is to set up a Recycling Networking Unit (RNU) in MHLG to serve as a national base for the accumulation, management and dissemination of data and information pertaining to stakeholders and 3Rs programmes and activities undertaken at the local level. The project's secondary purpose is to strengthen the human resource capacity and capability within MHLG to monitor SWM and 3Rs activities at the federal level.

5.2.2 Outputs

The Study Team worked in close collaboration and consultation with officers from the Recycling Unit of MHLG with the aim of producing the outputs outlined in Table 5.2.1.

Table 5.2.1 Output of PP-I

Output 1	An integrated data management system on solid waste management & 3Rs at the national level
Output 2	A Recycling Networking Unit (RNU) within MHLG
Output 3	Establishment of Information Management System
Output 4	Development of capacity and capability of staff in MHLG

5.2.3 Activities

A number of activities were undertaken to achieve the outputs identified in Table 5.2.1. These activities are summarised in Table 5.2.2 below.

Table 5.2.2 Summary of Activities Undertaken

Output	Activities
Output 1: Integrated Data Management System	Activity 1.1: Review of Existing Reporting Format of 3Rs Activities Activity 1.2: Analysis of Existing Data Activity 1.3: Development of New Reporting Format Activity 1.4: Conducting of Desktop Test/trials
Output 2: A Recycling Networking Unit	Activity 2.1: Collection and management of data from LA Activity 2.2: Establishment and maintenance of stakeholders directory Activity 2.3: Liaison with LAs, stakeholders and public
Output 3: Information Management System	Activity 3.1: Establishment of Local Authorities Information Database Activity 3.2: Establishment of Stakeholders' Networking Database
Output 4: Capacity Development of MHLG Staff	Activity 4.1: Preparation of Manual of Database Management Activity 4.2: Conduct On-the-Job Training

5.2.4 Implementation Schedule

To achieve the 4 outputs, the activities outlined in Table 5.2.2 were undertaken in sequentially over a 6-month period as shown in Table 5.2.3.

Table 5.2.3 Implementation Schedule of PP-I

	Activities	Jun	Jul	Aug	Sep	Oct	Nov
1	Est. of Recycling Networking Unit (RNU)						
2	Est. of Data Management Systems on SWM						
2-1	Review of existing reporting format						
2-2	Analysis of existing data						
2-3	Development of new reporting forms						
2-4	Desktop testing of new reporting system						
3	Est. of Information Management System						
3-1	Development of LA information database						
3-2	Dev. of stakeholders' networking database						
4	Capacity Development of MHLG						
4-1	Prep. of manual of info. management system						
4-2	Conduction of on-the-job training (OJT)	←-----	-----	-----	-----	-----	----->

Briefly, the project commenced with a review of the existing reporting format for waste flow and 3Rs activities as well as the reports sent to MHLG by some LAs between January 2003 and May 2005. This stage of the project was undertaken between July and

mid-August 2005. The aim was to appreciate the issues and problems of data collection (and their accuracy) faced at the federal and local level, evaluate whether or not the existing reporting format used by the LAs are adequate and user-friendly, to develop a new format that is more streamlined, uniform and usable by all LAs, and to develop the preliminary structure for an Integrated Data Management System.

Following the review, a series of discussions and workshops were held between mid-August to mid-September 2005 to present the revised reporting format to the LAs. At this stage of the project, representatives from the LAs were briefed on the usability of the new format, and more importantly, the need for LAs to cooperate and provide constant feedback on a monthly basis to MHLG on the state of recycling activities within the area of their jurisdiction.

The activity conducted between mid-September to end November 2005 involved trying out the new reporting format by the 10 LAs selected for the project. Reports submitted by the some of the 10 LAs on their “Recycling Programme” and “Recyclables Collection Data” using the new reporting format were analysed, reviewed and evaluated to ascertain the applicability of the new format, as well as to further finetune the LAs Information Database and the Information Management System.

In tandem with the new reporting format involving the 10 LAs, a questionnaire survey was also conducted of 104 LAs to gather baseline information about the LAs and their 3Rs activities, if any, with the aim of setting up the basic structure for the Stakeholders’ Networking Database.

The last activity of the project involved capacity development of MHLG staff. In November 2005, on-the-job training was conducted for staff of the Recycling Unit. The staff were shown the outputs of the project, how to analyse, update and maintain the Information Management System.

Details of the activities are described further in Section 5.3. The flow sequence of activities is diagrammatically illustrated in Figure 5.2.1. Figure 5.2.1 shows the flow diagram for the review of the existing reporting format and the drafting of the new format for waste flow and 3Rs activities to be used by the LAs.

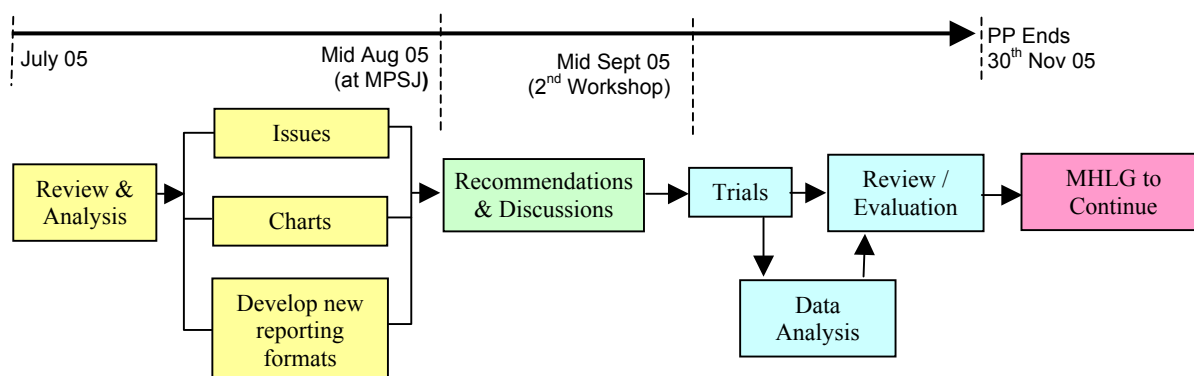


Figure 5.2.1 Flow Diagram for the Review and Drafting of New Reporting Format for Waste Flow & 3Rs Activities

5.2.5 Inputs

In addition to technical advice and consultants stationed at MHLG, JICA provided the computer hardware and software needed to develop the outputs. MHLG allocated the space within the ministry to set up the Recycling Networking Unit as well as personnel to establish and coordinate liaison with the 10 LAs selected for the project. Details of the inputs are listed in Table 5.2.4.

Table 5.2.4 Inputs for PP-I

Japan	Malaysia
(1) Personnel - JICA Study team members: - JICA local team members - Local consultants (2) Equipments - Computer (Hp Compaq DX2000) - Printer (DeskJet 1280, HP LaserJet 1020) - Software (Microsoft Office, Access etc)	(1) Personnel - MHLG - Officers from 10 LAs: (MB Miri, MP Subang Jaya, MP Pulau Pinang, MD Kinta Selatan, DB Kuala Lumpur, DB Kota Kinabalu, MB Johor Bahru, MB Kuching Selatan, MB Shah Alam, MP Kuantan) (2) Facilities - Space for Recycling Networking Unit in MHLG (“Bilik Kitar Semula”)

5.3 Results of Activities

5.3.1 Establishment of Data Management System

(1) Existing Reporting Format for Waste Flow and 3Rs Activities

The existing reporting procedure under the National Recycling Programme (NRP) requires the cooperation of all LAs to prepare and submit monthly reports on their recycling activities to MHLG. The report was to be divided into 2 main sections: first, “Report on Recycling Programme” and second, “Recyclables Collection Data”.

The Report on Recycling Programme is a written report on what the LAs have been doing and planned to do with respect to recycling, what the achievements are, who their partners are, etc. This report is supposed to be submitted to MHLG on a monthly basis to enable MHLG to develop and maintain a database on the state of waste minimisation programme and activities within the various LA areas.

Examples of some of the existing reports submitted to the MHLG are shown in Plate 5.3.1.



Plate 5.3.1 Example of Report on Recycling

The Recyclables Collection Data report is in a table format following the predefined format provided by MHLG. Data and statistics of recyclable collection quantities, type of recyclables, collection locations, and the like, are supposed to be entered in the form and forwarded to MHLG on a monthly basis.

(2) Collecting and Collation of Reports and Information

The initial task of the review exercise was to collect and collate all available reports and information from MHLG. For the purpose of this project, only information and data officially submitted by the LAs to MHLG were reviewed.

The first task of the review process was to separate the large volume of reports (in hardcopy) according to LAs and their respective States. The reports were further arranged in chronological order with the most current reports at the top. These were then filed in the respective “State” files as shown in Plate 5.3.2.



Plate 5.3.2 Recyclables Collection Data Report by States

Since the launch of the NRP, reports were received intermittently from the LAs. The majority of the reports received by MHLG were submitted between January 2003 and May 2005.

According to records of MHLG, a total of 104 LAs registered their interest in participating in the NRP. However, after collating the available reports, it was found that only 38 LAs have submitted a least one official report to MHLG during that period. This accounts for only about 37% of the total participating LAs. No reports were received from the LAs in Perlis, Terengganu and Kelantan.

The majority of the reports received were tabulation of recyclables collection data. Comparatively few reports on the recycling programme were submitted over the period of January 2003 and December 2004 and no reports received between January and August 2005.

The list of 38 LAs that submitted their reports is shown in Table 5.3.1. The 4 LAs, highlighted in yellow were selected by JST as model LAs for the preparation of the LAP-WM and for Pilot Projects II and III. They were MB Miri, MP Subang Jaya, MP Pulau Pinang and MD Kinta Selatan.

Table 5.3.1 Shortlist of LAs that have submitted their Recyclables Collection Data Reports (from Jan. 2003 to May 2005)

Item	States / LA	2003	2004	2005	Item	States / LA	2003	2004	2005
1	Majlis Bandaraya Kuching Selatan	5	12	5	20	UPKT - Majlis Perbandaran Nilai	0	0	2
2	Majlis Perbandaran Seremban	5	10	5	21	Majlis Daerah Bertong	12	9	1
3	Majlis Daerah Lipis	0	9	5	22	Majlis Perbandaran Taiping	10	8	1
4	Majlis Perbandaran Temerloh	0	5	5	23	Majlis Perbandaran Pulau Pinang	1 Rpt	0	0
5	Majlis Daerah Sri Aman	0	3	5	24	Majlis Perbandaran Ampang Jaya	0	1 Rpt	0
6	Majlis Daerah Jasin	0	1	5	25	Majlis Perbandaran Batu Pahat	0	1 Rpt	0
7	Majlis Daerah Kinta Selatan	4	12	4	26	Majlis Daerah Segamat	7	9	0
8	Dewan Bandaraya Kuala Lumpur	5	12	4	27	Majlis Bandaraya Shah Alam	0	6	0
9	Majlis Perbandaran Manjung	12	0	4	28	Majlis Perbandaran Kuantan	0	5	0
10	UPKT - Majlis Perbandaran Seremban	0	0	4	29	Majlis Daerah Cameron Highlands	1 Rpt	3	0
11	UPKT - Majlis Perbandaran Port Dickson	0	0	4	30	Majlis Daerah Jempol	0	2	0
12	Majlis Daerah Kerian	0	12	3	31	Majlis Daerah Pekan	4	2	0
13	Majlis Daerah Raub	6	12	4	32	Majlis Perbandaran Padawan	2	2	0
14	Majlis Bandaraya Johor Bahru	8	12	3	33	Majlis Bandaraya Melaka Bersejarah	1 Rpt	1	0
15	Majlis Bandaraya Miri	0	12	3	34	Majlis Perbandaran Sungai Petani	2	0	0
16	Majlis Bandaraya Ipoh	8	10	3	35	Majlis Perbandaran Subang Jaya	1 Rpt	1 Rpt	0
17	Majlis Perbandaran Sibu	4	3	3	36	Majlis Perbandaran Kajang	1 Rpt	0	0
18	Majlis Perbandaran Teluk Intan	4	11	2	37	Majlis Perbandaran Klang	1 Rpt	0	0
19	Dewan Bandaraya Kuching Utara	4	9	2	38	Majlis Daerah Kota Belud	1 Rpt	0	0

The summary list of 104 LAs participating in the NRP and the number of reports submitted is shown in Table 5.3.2. The rows highlighted in grey indicate the LAs that did not submit any reports. Those highlighted in yellow are the 4 model LAs.

5-7

(3) Preliminary Findings

Due to time constraint, it was not practical to review all the existing reports; hence, only general reviews of the most current reports (from January to May 2005) were carried out. Arising from the review, 10 LAs were identified and selected as model LAs for the project.

Basically, the preliminary review identified the types of information submitted and the usefulness and relevance of these information evaluated. Positive and negative salient points were also identified so that future measures and counter-measures could be developed and implemented.

The preliminary findings of the review of existing reports submitted by the LAs are as follows:

- a) **Absence of Data Management System within MHLG**
A coordinated system within the Recycling Unit to systematically manage and maintain information and data received from the LAs on recycling-related organisational structure and functions, names and contact details of personnel involved in recycling, number and location of collection centres/bins, networking and existing infrastructure, etc, was absent.
- b) **Status of Reporting from LAs**
Almost all the reports submitted by the LAs provided recyclables collection data and quantities in table form. The “Report on Recycling Programme” were not submitted. The few available “Recycling Programme Reports” were mostly submitted in 2003, and thus, the information and data provided were outdated.
- c) **Quality of Data Reports from LAs**
The majority of the recyclables collection data reports only indicated activities and collection data carried out by the LAs or by their contractors/SWM concessionaire companies. There was relatively scant information on the activities of private recyclers and other stakeholders. Most of the collection data on recyclables pertain to collection of old newspapers collected by schools. Other recyclables collected were reported on an ad-hoc basis and these only represented an insignificant amount of total recyclables collected.

(4) Analysis of Data Reported from LAs

Since it was not practical to review all the available data, it was decided that up-to-date data submitted by 10 to 12 of the most regular LAs would be reviewed. Amongst these include the 4 model LAs, namely, MP Pulau Pinang, MP Subang Jaya, MB Miri and MD Kinta Selatan.

From the preliminary review, about 13 LAs were identified for having submitted their collection data regularly. These LAs were DB Kuala Lumpur, DB Kuching Utara, MB Johor Bahru, MB Ipoh, MB Kuching Selatan, MB Miri, MP Subang Jaya, MP Pulau Pinang, MP Taiping, MP Temerloh, MD Kinta Selatan, MD Lipis and MD Raub. In addition, reports from MP Kuantan for April and May 2004 were also reviewed because their method of reporting was different from the others and considered to be a method that is worth analysing.

The most recent recyclables collection data, from January to May 2005, received from the above 14 LAs were analysed. The main purpose is to appreciate the LA's recycling activities, their results and to try to identify any trends, irregularities and shortcomings. From these, countermeasures and solutions could be developed and introduced to enhance or resolve the issues.

To understand the significance of the collection data, the data were presented in the "bar-chart" format showing the quantities collected for the particular period. From these charts, the trends were deduced and a comparison was made between the type and quantity of recyclables collected by the different LAs.

The data analysis exercise was carried out in July and August 2005. During that time no data reports were received from MP Subang Jaya and MP Pulau Pinang. However, both LAs later submitted their reports in September and October 2005. Since these two LAs were selected as the model LAs, their reports were also included in the analysis exercise.

A summary of the recyclables collection data for the selected LAs for the corresponding months are tabulated and plotted on the bar chart shown in Figure 5.3.1. Figure 5.3.1 shows that the collection activities for the northern region are generally better than for the other regions. It also shows that paper and cartons are the preferred recyclable items collected. However, it must be appreciated that the charts were plotted with data submitted by the respective LAs. They do not necessarily represent the "real" recycling collection activities of the LAs. Nevertheless, these charts indicate and reflect that the overall response of certain LAs to recycling are generally lacking, hence the low figures reported.

Some of the more obvious trends and conditions deduced from the analysis exercise and from the charts are as follows:

- a) With the exception of MP Subang Jaya, most of the LAs in the central and southern regions depend exclusively on their concessionaire companies to manage the recycling activities and to perform recyclables collection. The data submitted are mainly collection activities and data from the concessionaire, and does not include recycling activities of the other players in the private sector. Hence, the low collection quantities in these areas might not reflect the actual situation.
- b) Most LAs concentrate mainly on promotional and awareness events, targeting the schools and at selected housing areas. The quantities collected at such events are small and generally on a "once-off" collection basis.
- c) Due to market forces and local demand, only paper and cartons are collected in large quantities. A fair amount of aluminium cans are also collected. Generally such items are targeted as they are easier to collect and transport.

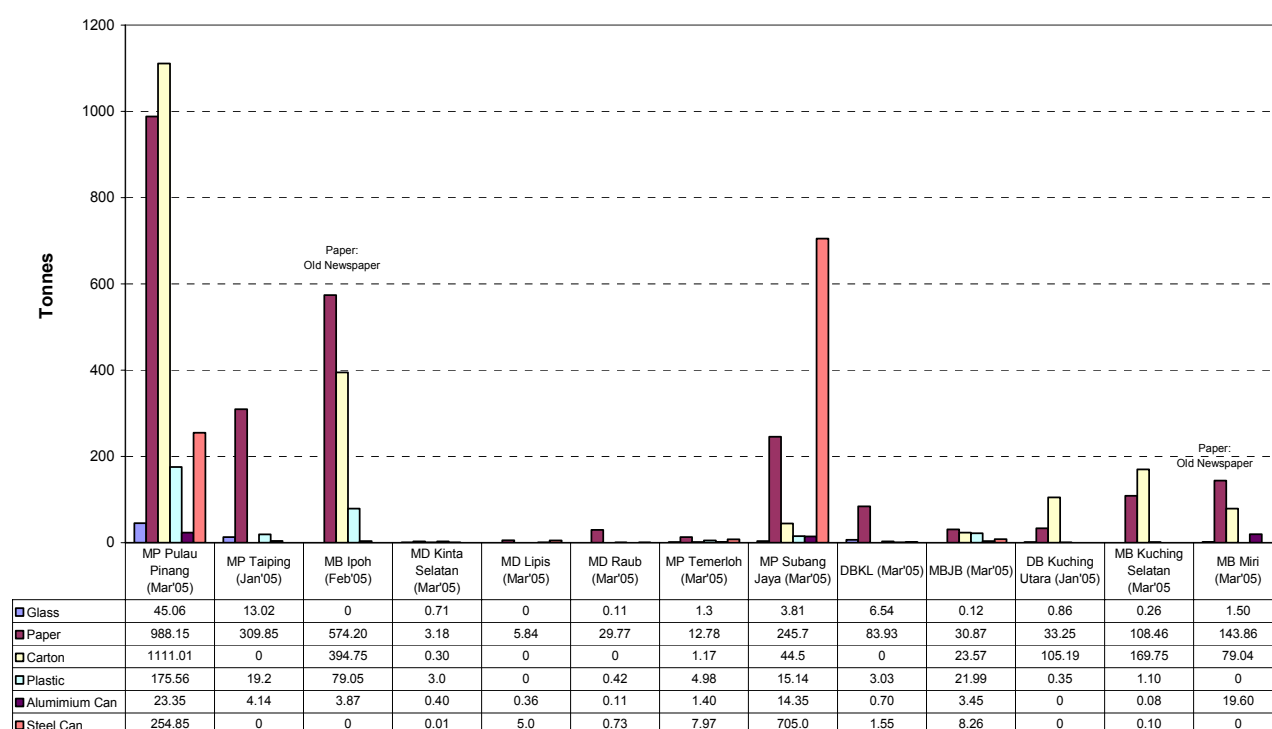


Figure 5.3.1 Recyclable Collection Data by LAs

(5) Development of New Reporting Format

Based on the above analysis and issues identified, it was concluded that the existing reporting format could be further enhanced to capture as much as possible the recyclables collection data and information from the actual collectors themselves, i.e., from the private collectors, contractors and traders.

In discussions with MHLG, it was decided that a new recyclables collection data reporting method and format should be developed and tested with the assistance of a number of LAs.

In order to appreciate the steps necessary to formulate the new recyclables collection data reporting methods and format, there is the need to identify and understand the waste/recyclables flow, i.e. which sector to target, who are the players / stakeholders, and what type of recyclables to target.

During the development stage of the new reporting format, various discussions with MHLG were held together with two separate presentation and discussions meetings, and attended by representatives from MHLG, the JICA Study Team members, and other representatives from the selected LAs. The first PP-I Meeting on “Presentation of Review of Present Reporting Format” was held on 11th July 2005 at MHLG’s 4th Floor Meeting Room. The second was held on 11th August 2005 at the Meeting Room 1, Majlis Perbandaran Subang Jaya.

The Minutes of Meeting for both the meeting are attached in Appendix 1.

1) Target Sector

Based on the understanding of the present waste/recyclables collection and transfer activities, the recyclables flow can generally be depicted in the waste (recyclables) flow diagram as shown in Figure 5.3.2. There are the generators, i.e. the households, businesses entities, industrial sectors, etc. Some of the wastes generated from non-process activities are included. From the generators, the recyclables goes to the collectors and then to the traders and users. Some will eventually end up at disposal sites, but even at landfills, scavenging activities may also return some recyclables items to the collectors. These activities are all mutually interdependent.

The general flow pattern can further be summarised to show the levels of flow as shown in Figure 5.3.3, the waste (recyclables) flow pyramid. This pyramid was discussed during the 1st PP-I Meeting on 11th July 2005, and was agreed and accepted by MHLG for use during the PP-I trials.

The waste (recyclables) flow pyramid shows the main four (4) levels of recycling activities, i.e. from the Generators (Level D) to the Collectors (Level C), and then to the Receivers/Traders (Level B), and finally, to the Recyclers/End Users (Level A). Recyclables would be transferred from the Generators (Level D) all the way upward towards Level A. No doubt, there will be some horizontal transferring between stakeholders on the same level but the ultimate flow will be from Level D to Level A.

To appreciate the full picture of the recycling activities, all the Levels should be targeted. However, it may not be viable or practical to deal with the larger groups such as the Generators (Level D) and Collectors (Level C). There are just too many Generators to monitor and from whom to gather information. Similarly, the Collectors (Level C) comprise of groups of individuals or companies that collect the recyclables. Not all are registered or report their activities to any related authorities. It may be difficult to track down such players and even more difficult to obtain their cooperation to divulge collection statistics and information.

As the flow stream narrows, i.e. passed on from the Collectors to the Receivers (Level B). This group could be regarded as representing the final collection point for the items prior to recycling or re-processing. Receivers and Traders (Level B) can be considered as the more suitable level to be targeted and from whom to obtain the data and information. The majority of the public drop-off / buy back centres are owned by the LAs and generally operated by concessionaire companies, NGO or LA-appointed contractors; hence, it should be relatively easier to obtain data from these players. For the private receivers, the LAs would have to identify these players, encourage them to cooperate and report their data to the LAs. In the future, the LAs should implement some sort of registration mechanism to monitor these players.

Recyclers/Users (Level A) consist of the actual processors of the recyclable items. Such activities may include cutting/chipping, re-processing to make raw materials, etc. The final product would either be used internally by the recycler or be sold to other end-users. Ideally, the recycling activities of Level A should also be targeted but since the majority of these players are from the private sector, it may be difficult to obtain the cooperation of these players and to gather their confidential data and information. Similarly, the LAs should also implement some sort of registration mechanism to maintain directories of such players and perhaps request some of these players to voluntarily submit their activities reports to the LAs.

In conclusion, it was decided that for the purpose of obtaining more meaningful and relevant recyclables collection data and information, the Receivers and Traders (Level B) should be targeted.

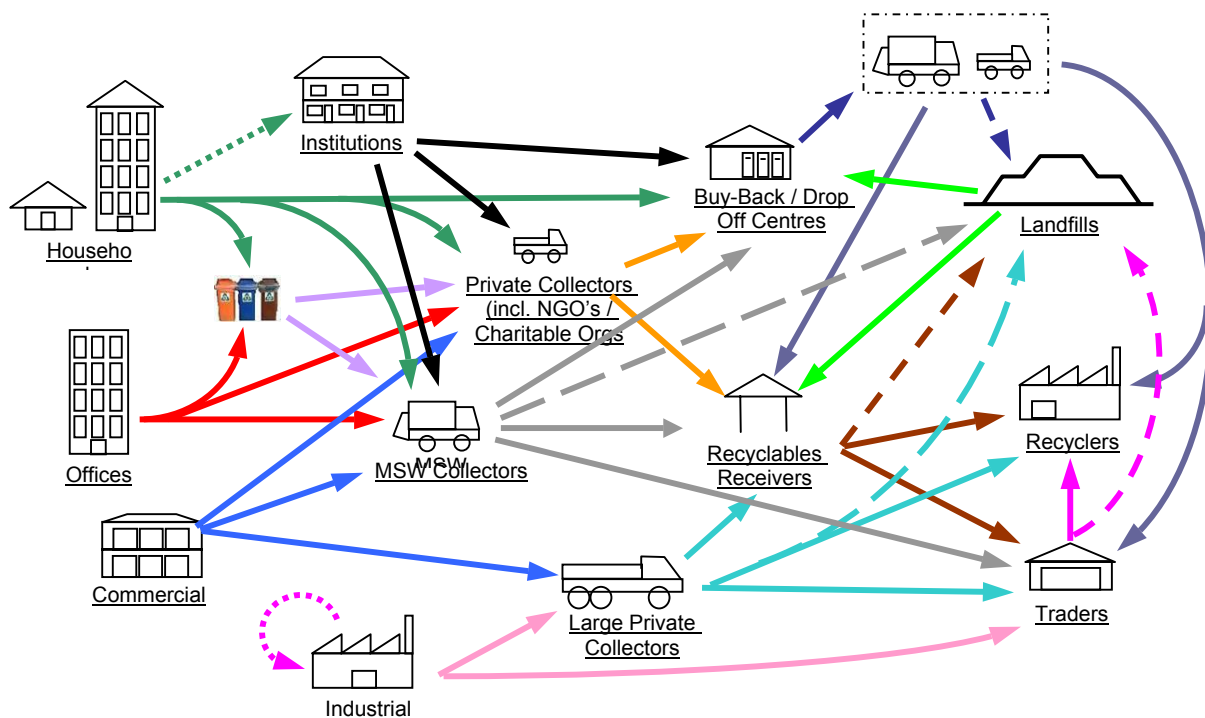


Figure 5.3.2 Waste (Recyclables) Flow Diagram

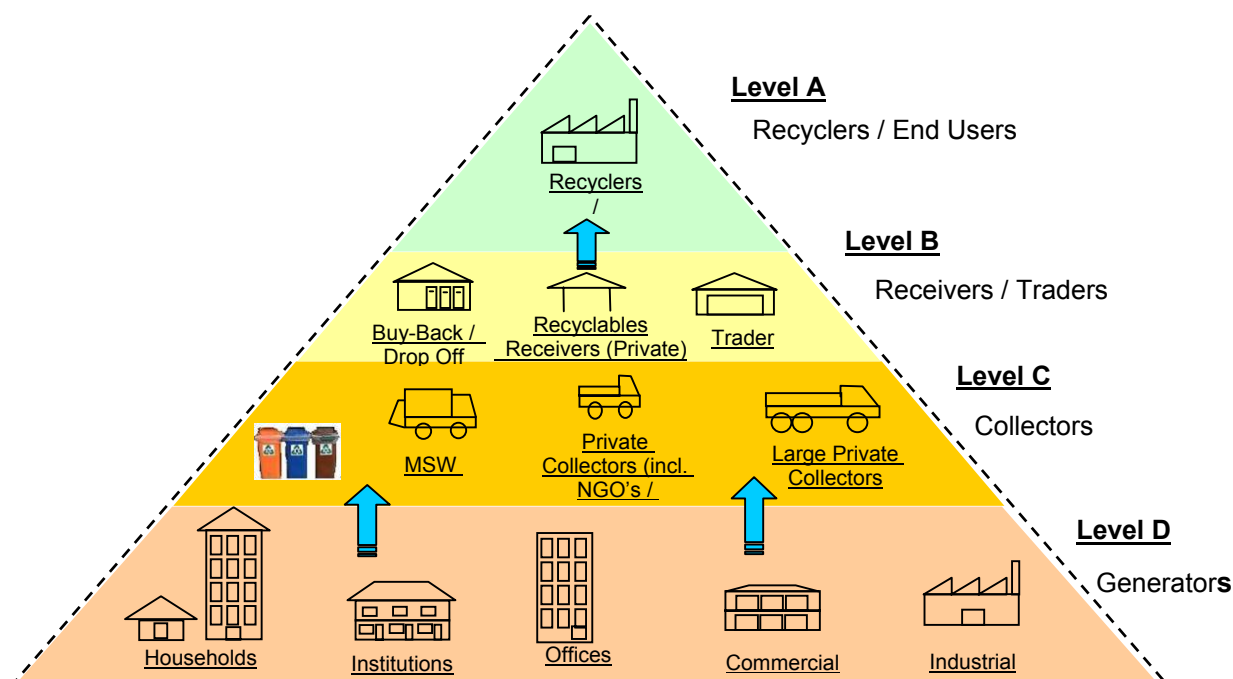


Figure 5.3.3 "Waste (Recyclables) Flow Pyramid"

2) Target Recyclables

Generally in Malaysia, the preferred MSW recyclables collection items are the paper products, plastics, glass containers and aluminium and ferrous items. Generally, these have been lumped together as just paper, glass, plastics and metals.

The present reporting format just requires the collection data to be reported under these 4 categories and no further breakdown was necessary. During the data review period, it was decided that some further breakdown of the categories should be made and this will then provide a clearer picture of the trends of recyclables collections in the country.

The Target Recyclables for the new Recyclables Collection Data Reporting format are shown in Table 5.3.3.

Table 5.3.3 List of Target Recyclables

	Main Category	Sub Categories
(i)	Paper (<i>Kertas</i>)	• Newspaper (<i>Surat Khabar</i>) • Magazines & Books (<i>Majalah / Buku</i>) • Cardboard & Carton (<i>Karton</i>) • Used White Paper (Office) (<i>Kertas Putih (Pejabat)</i>) • Mixed Paper (<i>Kertas Campur</i>) • Others (<i>Lain Lain</i>)
(ii)	Glass (Bottle) (<i>Bekas Kaca</i>)	• Clear (Flint) (<i>Jernih</i>) • Coloured (Amber/Green) (<i>Berwarna</i>) • Mixed Glass (<i>Kaca Campur</i>)
(iii)	Plastic (<i>Plastik</i>)	• PET Bottles (<i>Botol PET</i>) • Other Plastic Containers (<i>Bekas Plastik Lain</i>) • Plastic Sheets (bags, straps) (<i>Kepingan Plastik</i>) • Foamed Plastics/Styrofoam (<i>Fom Plastik</i>) • Other Plastics (<i>Lain Lain Plastik</i>)
(iv)	Metals (<i>Logam</i>)	• Aluminium Cans (<i>Tin Aluminum</i>) • Ferrous (<i>Besi / Keluli</i>) • Non-Ferrous Metals (<i>Bahan Bukan Besi</i>)
(v)	Clothing/ Textiles (<i>Kain</i>)	• Mixed Fabrics (<i>Fabrik Campur</i>)
(vi)	Rubber (<i>Getah</i>)	• Tyres (<i>Tayar</i>) • Other Rubber Materials (<i>Lain Lain</i>)
(vii)	Others (<i>Lain Lain</i>)	• (To Specify) (<i>Sila Nyatakan</i>)

Items (i) to (iv) are the four most common and preferred recyclable items. Item (v), clothing/ textiles have been included because these items are being collected in large quantities, as second-hand items and also as scraps for fibre recovery. The statistics on the collection of such items should be documented if available. Similarly with item (vi), rubber, there are large numbers of old used vehicle tyres and rubber products that are being disposed off. Currently very little information and data of their collection have been documented; hence it is necessary to collect such information, if available. The above target recyclables items have been presented and discussed during the 1st PP-I Meeting and was agreed and accepted by MHLG for use during the PP-I trials.

3) New “Recyclables Collection Data Form”

The new recyclables collection data form is shown in Table 5.3.4 below. The new form has included all the target recyclables categories, and also their sub-categories. For the purpose of the Pilot Project, two versions were prepared: one in the English language and the other in the Bahasa Malaysia language. For the purpose of official reporting by

the LAs, the Bahasa Malaysia language version shall be used. A copy of the form is attached in Appendix 4, together with a brief description on how to fill in the form.

The new format is prepared using in the Microsoft Excel worksheet format. All LAs are to fill in the form electronically, and email to MHLG.

Table 5.3.4 Example of Recyclables Collection Data Form

RECYCLABLES COLLECTION DATA FORM								
Name of Local Authority								
Month		Year		Total MSW Collected				tonnes/mth
	COLLECTION LOCATIONS							Total (kg)
No	RECYCLABLES (kg)							
1.0	Paper							
1.1	Newspaper							
1.2	Magazines & Books							
1.3	Cardboard & Carton							
1.4	Used White Paper (Office)							
1.5	Mixed Paper							
1.6	Others							
	SUB-TOTAL (1)							
2.0	Glass							
2.1	Clear (Flint)							
2.2	Coloured (Amber / Green)							
2.3	Mixed Glass							
	SUB-TOTAL (2)							
3.0	Plastic							
3.1	PET Bottles							
3.2	Other Plastic Containers							
3.3	Plastic Sheets (bags, straps)							
3.4	Foamed Plastics / Styrofoam							
3.5	Other Plastics							
	SUB-TOTAL (3)							
4.0	Metals							
4.1	Aluminium Cans							
4.2	Ferrous							
4.3	Non-Ferrous Metals							
	SUB-TOTAL (4)							
5.0	Clothing/Textiles							
5.1	Mixed Fabrics							
	SUB-TOTAL (5)							
6.0	Rubber							
6.1	Tyres							
6.2	Other Rubber Materials							
	SUB-TOTAL (6)							
7.0	Others (Please Specify)							
7.1								
7.2								
7.3								
	SUB-TOTAL (7)							
	GRAND TOTAL (1+2+3+4+5+6+7)							

(6) Conducting of desktop test/trials

1) Selection of LAs for PP-I Trial

For the purpose of PP-I, it was decided by MHLG and the JST that only 10 LAs would be selected to participate in PP-I reporting trials. These 10 LAs for PP-I would be requested to submit their collection data reports based on the new proposed reporting format as proposed above

The selection of the 10 LAs as pilot project candidates was based on the following selection criteria.

Basic Selection Criteria

- i. The 4 model LAs are automatically selected as PP-I trials candidates
- ii. Other remaining 6 LAs must be active in 3Rs and have submit their monthly reports regularly
- iii. Preference for the larger LAs, i.e. DB, MB, MP, followed by MD
- iv. The LAs are to be selected based on their geographical location, i.e. at least one LA selected from the Northern, Central, Southern and Eastern Regions of the Peninsula, and one from Sabah and Sarawak
- v. Final selection is subject to MHLG's approval

Based on the above selection criteria (i), the first 4 candidates were automatically determined. Based on recommendations as identified by the review process and discussions with MHLG, the final LAs for PP-I were identified and invited to participate in the presentation and discussion meeting on 11th August 2005 at MPSJ. The list of candidates is tabulated in Table 5.3.5.

Table 5.3.5 List of LAs for PP-I Trial

No.	LAs	States
1	MB Miri	Sarawak
2	MP Subang Jaya	Selangor
3	MP Pulau Pinang	Pulau Pinang
4	MD Kinta Selatan	Perak
5	DB Kuala Lumpur	Wilayah Persekutuan
6	DB Kota Kinabalu	Sabah
7	MB Johor Bahru	Johor
8	MB Kuching Selatan	Sarawak
9	MB Shah Alam	Selangor
10	MP Kuantan	Pahang

2) Reporting Trials for New “Recyclables Collection Data”

As mentioned earlier, part of the scope of PP-I requires the new proposed reporting method to be tried and tested by the selected 10 LAs. The candidates would be required to implement the new system on a trial basis for a period of 3 months, i.e. August, September and October 2005.

Prior to the launch of the trials at the JICA Study's 2nd Training Workshop on 13 September 2005 at Hotel Vistana in Kuala Lumpur, two separate presentation and discussions were held and attended by representatives from MHLG, JST members and representatives from the LAs.

The 3 basic requirements for the trials are as follows;

- a) LAs are to collect the recyclables collection data from the Receivers and Traders (Level B). The LAs would have to identify the players in this group and obtain their cooperation and gather the relevant data. LAs should also register these players and create a database of their business details and information on their recycling activities.
- b) LAs are required to tabulate the data in the new recyclables collection data form, and they are encouraged to breakdown the sub-categories as much as possible

according to their own purpose. Softcopies of the template of the new reporting format were issued to the representatives of the participating LAs' during the JICA Study 2nd Technical Workshop.

- c) LAs are to send the data files to the PP-I office, temporarily based on the first level of MHLG via email to kitarsemula@kpkt.gov.my, on a monthly basis. Even after the trial period, LAs are to continue to submit their monthly reports to MHLG.

In return, the PP-I team would review and analyse the data and present the statistics in charts and graphical form. The brief description on how to fill in the forms is explained in Appendix 2, together with basic procedures on how to present the data in graphical format for further analysis by MHLG. The brief description on how to process and analyse the data is explained in Appendix 3.

3) Submission of Recyclables Collection Data Report in New Format

At the meeting of 11th August 2005 at MPSJ with the 10 LAs and chaired by MHLG, no objections or withdrawals were offered by representatives of the LAs; hence, it was assumed the LAs have registered their interest to participate in the trials of the new reporting format. However, based on the number of submissions to date, it was noted that the response were slow and only 4 out of 10 LAs submitted their report as requested. The LAs include MB Miri, MP Pulau Pinang, MD Kinta Selatan and MB Kuching Selatan.

A summary of the reporting status of participating LAs are tabulated in Table 5.3.6.

Table 5.3.6 Reporting Status of Participating LAs

No.	LAs	Status (reports submitted as of 20 Nov 2005)
1	MB Miri	Sep & Oct (not following new format)
2	MB Kuching Selatan	Sep and Oct (in new reporting format)
3	MP Pulau Pinang	Aug, Sep and Oct (incomplete and not following new format).
4	MD Kinta Selatan	Aug, Sep and Oct (in new reporting format)
5	DB Kuala Lumpur	No report
6	DB Kota Kinabalu	No report
7	MB Subang Jaya	No report
8	MB Johor Bahru	No report
9	MP Kuantan	No report
10	MB Shah Alam	No report
11	Perbadanan Putrajaya	Withdrew

Note: During the trial period, various reminders by telephone were made to remind and encourage the LAs to submit their data. General responses to the telephone reminders indicated that the LAs would try their best to prepare their reports but are experiencing difficulties and setbacks due to lack of manpower resources and time. Brief discussions were also held with MHLG to request their assistance to encourage the LAs to cooperate.

5.3.2 Establishment of Recycling Networking Unit (RNU)

The RNU set up under PP-I is a temporary workstation comprising a desktop computer with the necessary peripherals and supporting software shown in Plate 5.3.3. The temporary PP-I workstation is located in "Bilik Kitar Semula" at MHLG.



Plate 5.3.3 RNU Workstation for PP-I

5.3.3 Establishment of Information Management System (Basic Structure)

The purpose of establishing the Information Management System (IMS) is to set up a basic structure for MHLG to manage and maintain their database resources digitally. Once the various databases have been established, they could be accessed easily. In the future, the database could be published on MHLG's website for public access.

As part of the continuous training and capacity building programme, various on-the-job briefing sessions were conducted with the counterparts from MHLG. This also included 2 presentations and discussions sessions on 11th July and 11 August 2005, together with JST's 3rd Technical Workshop Session on 13th September 2005. In addition, two more training sessions were conducted on 26th and 27th October 2005, with the counterparts from MHLG on the usage of the IMS.

(1) Information Management System (IMS) – Basic Structure

The main purpose of the IMS is to create a database of the recyclables collection data and key information that have been submitted by the LAs, in electronic format. With the system, key data could easily be accessed, searched, tabulated and presented in charts form for easier review, analysis and presentations.

For the purpose of PP-I, the IMS was structured in 2 formats, i.e. Microsoft Excel Datasheets and Charts format for the Recyclables Collection Data, and Microsoft Access Database format for the LAs Information Database.

For the Recyclables Collection Data system, the data should be submitted in the electronic format, i.e. in Microsoft Excel Spreadsheet format. Once the data is received by the RNU, the data is rationalised before being entered into the database. Human interface is required to analyse and tabulate the data in a more structured manner. Once the data table has been set, bar charts have to be generated to present the data in more visual and understandable form. Such graphical manipulation could only be carried manually with the aide of Microsoft Excel Graph functions.

Basic Structure of the IMS is shown as Figure 5.3.4.

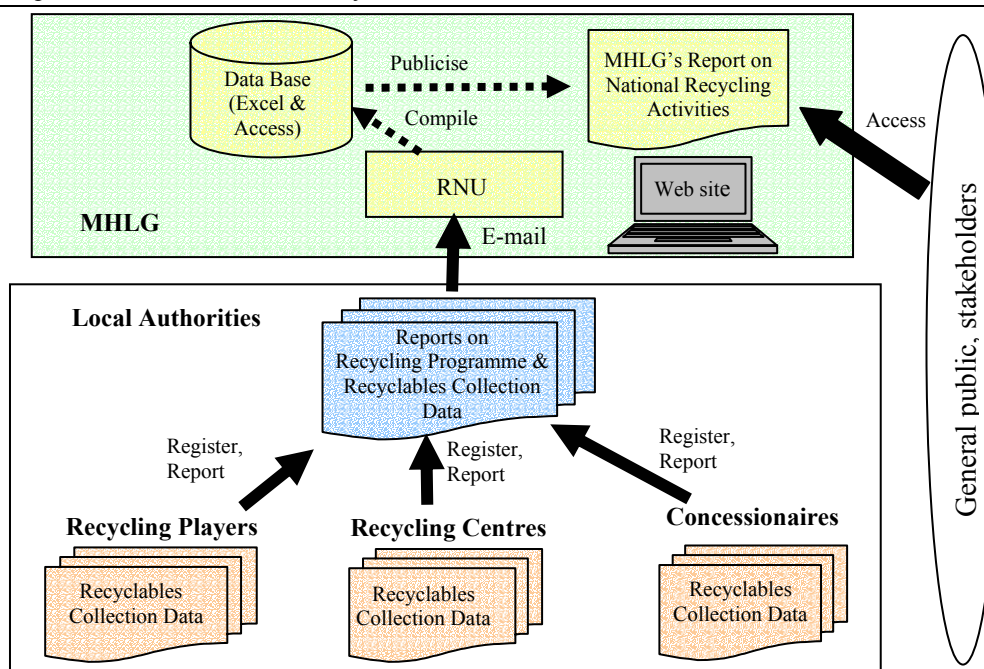


Figure 5.3.4 Basic Structure of the IMS

1) Local Authorities Information Database

In the review of data and information available at MHLG, it was noted that there was no specific database of the 104 LAs that are participating in the National Recycling Programme (NRP). No proper documentation were kept of the LAs contact details, the division and personnel, location of recycling bins and centres, etc.

To create the database of LA's recycling related information system, an entirely new set of information would have to be collected. In discussions with MHLG, it was decided that a postal questionnaire survey exercise be conducted where questionnaire forms would be re-sent to all the 104 LAs. The purpose was to obtain as much information as possible on the LA recycling activities so that an updated database could be created and maintained regularly based on their subsequent feedback through their monthly reports on recyclables collected.

The questionnaire was structured into 4 main topics, as follows;

1. LA's general information, i.e. their address, contact details, email and website addresses.
2. Information on recycling activities, i.e. locations of collection centres and bins, collectors or contractors, types of recyclables collected, etc.
3. Information of LA's Recycling Unit / Division, i.e. address, contacts details, and personnel involved, etc.
4. LA's stakeholder information, i.e. directory of stakeholders, collectors, interest groups, associations, etc.

The 3-page questionnaire form was produced and on the request of MHLG, it was written in the Bahasa Malaysia language, and entitled "BORANG MAKLUMAT PROGRAM KITAR SEMULA". With the assistance of MHLG, the questionnaire was sent to the LAs on 27th September 2005. As of 22 November 2005, a total of 59 of the

104 LAs have submitted back their replies. This accounts for about 56% of the total. A summary list of the LAs that have submitted their replies is tabulated in Table 5.3.7.

The completed replies were faxed to the “Bilik Urusetia Kitar Semula” at MHLG. Initially, the questionnaire fields and information in the forms were manually entered to create the master data file in Microsoft Excel Worksheet format. Example of the Excel data sheet is shown in Table 5.3.8.

Table 5.3.7 List of LAs that Have Submitted their Survey Replies

Questionnaire Survey - MAKLUMAT PROGRAM KITAR SEMULA			
No.	Kedah Darul Aman	No.	Terengganu Darul Iman
1	Majlis Perbandaran Kulim	29	Majlis Perbandaran Kuala Terengganu
			Majlis Perbandaran Kemaman
	Pulau Pinang		
2	Majlis Perbandaran Pulau Pinang	30	Pahang Darul Makmur
3	Majlis Perbandaran Seberang Perai	31	Majlis Perbandaran Bentong
		32	Majlis Perbandaran Kuantan
	Perak Darul Ridzuan	33	Majlis Perbandaran Temerloh
4	Majlis Perbandaran Teluk Intan	34	Majlis Daerah Lipis
5	Majlis Perbandaran Manjung	35	Majlis Daerah Cameron Highlands
6	Majlis Perbandaran Taiping	36	Majlis Daerah Maran
7	Majlis Daerah Kinta Selatan		
8	Majlis Daerah Kerian		Johor Darul Takzim
9	Majlis Daerah Selama	37	Majlis Daerah Segamat
10	Majlis Daerah Gerik	38	Majlis Daerah Yong Peng
11	Majlis Daerah Tapah	39	Majlis Perbandaran Johor Bahru Tengah
12	Majlis Daerah Pengkalan Hulu	40	Majlis Daerah Kota Tinggi
13	Majlis Perbandaran Kuala Kangsar	41	Majlis Daerah Simpang Renggam
	Selangor Darul Ehsan		Sarawak
14	Majlis Perbandaran Subang Jaya	42	Majlis Perbandaran Sibul
15	Majlis Perbandaran Klang	43	Majlis Bandaraya Miri
16	Majlis Bandaraya Shah Alam	44	Majlis Bandaraya Kuching Selatan
17	Majlis Perbandaran Petaling Jaya	45	Dewan Bandaraya Kuching Utara
18	Majlis Perbandaran Selayang	46	Majlis Daerah Sri Aman
19	Majlis Daerah Kuala Langat	47	Majlis Perbandaran Padawan
20	Majlis Daerah Sabak Bernam	48	Majlis Daerah Lawas
21	Majlis Perbandaran Ampang Jaya	49	Majlis Daerah Limbang
		50	Majlis Daerah Lubuk Antu
	Wilayah Persekutuan	51	Majlis Daerah Marudi
22	Dewan Bandaraya Kuala Lumpur	52	Majlis Daerah Sarikei
23	Perbadanan Putrajaya	53	Majlis Daerah Serian
	Perbadanan Labuan	54	Majlis Daerah Maradong & Julau
		55	Majlis Daerah Saratok
24	Negeri Sembilan Darul Khusus		
25	Majlis Daerah Jempol		Sabah
26	Majlis Perbandaran Seremban	56	Majlis Daerah Kota Belud
	Majlis Perbandaran Port Dickson	57	Dewan Bandaraya Kota Kinabalu
		58	Majlis Daerah Kota Marudu / Pitas
27	Kelantan Darul Naim	59	Majlis Daerah Penampang
28	Majlis Perbandaran Kota Bharu		

The Excel database was then converted to Microsoft Access Database and tabulated in the “Form” format for ease of reference and searching. The database was given the file name “Maklumat_PBT” (LA’s Information). PBT = Pihak Berkuasa Tempatan”

The data and information were separated into 4 groups as follows:

1. “A_PBT_Info” - this holds all the general information about the LAs, including the council address, email and website address, the key personnel and their contacts details, etc. An example page is shown in Figure 5.3.5.
2. “B_lokasi_tong” - this holds information about the location of the LA’s collection centres, collection bins and the operators, i.e. either by LAs or by LAs appointed contractors. An example page is shown in Figure 5.3.6.
3. “C_kutipan” - this holds information on the type of recyclables the LA or collectors would collect from. An example page is shown in Figure 5.3.7.
4. “D_stakeholder” - this holds information of the stakeholders’ directory as submitted by the LAs. An example page is shown in Figure 5.3.8. Those marked “TIADA” indicates that the LAs did not keep any of their own stakeholders list or directory.

All the above data and information could be viewed, edited, searched and printed. New information could easily be entered into the ready made “FORMS” and would be instantly updated to the master database. Simple searches or “Filtering” could be performed by searching for key words or specific fields, e.g. by the LA’s name, etc.

Table 5.3.8 Example of “LAS Information Database” in Excel Worksheet Format

PBT	ALAMAT	POSKOD BANDAR	NEGERI	TELEFON A	TELEFON B	FAKS	E-MAIL	LAMAN WEB
Majlis Daerah Kota Tinggi	Jalan Padang	81900 Kota Tinggi	Johor	07-8831004		07-8834015	MDKT@johor.gov.my	
Majlis Daerah Segamat	No. 1, Jalan Abdullah	86000 Segamat	Johor	07-9314455		07-9312712	mdsai@johor.gov.my	www.johordt.gov.my/mds
Majlis Daerah Simpang Renggam	No. 1, Jalan Pejabat	86200 Simpang Renggam	Johor	07-7551300	07-7551303	07-7551302		
Majlis Perbandaran Johor Bahru Tengah	Pejabat Majlis Perbandaran Johor Bahru Tengah	81300 Skudai	Johor	07-5561005		07-5568007		www.johordt.gov.my/mpjbt
Majlis Daerah Yong Peng	Bt. 1, Jalan Labis Yong Peng	83700 Yong Peng	Johor	07-4671276		07-4671712		
Majlis Perbandaran Kulim	104-120, Lorong Kota Kenari 5/1, Taman Kota Kenat	09000 Kulim	Kedah	04-4906522		04-4901443	Ruzaim@mpkk.gov.my	www.mpkk.gov.my
Majlis Perbandaran Kota Bharu Bandar Raya Islam	Jalan Hospital	15000 Kota Bharu	Kelantan	09-7463344		09-7439288		http://www.mpkk.gov.my
Majlis Perbandaran Port Dickson	No. 21, Tkt Atas, Pusat Perniagaan Cahaya Suria	71000 Port Dickson	Negeri Sembilan	06-6517251		06-6515416		
Majlis Perbandaran Seremban	Wisma MPS, Jalan Yam Tuan	70990 Seremban	Negeri Sembilan	06-7623381		06-7637449		www.mpsns.gov.my
Majlis Daerah Jempol	Pejabat Majlis Daerah Jempol	72120 Sri Jempol	Negeri Sembilan	06-4581233		06-4586800	mdj@rm.net.my	www.mojil.gov.my
Majlis Perbandaran Bentong	Majlis Perbandaran Bentong, Jalan Ketari	28700 Bentong	Pahang	09-2221148		09-2223729	mdbentong@pahang.gov.my	www.pahang.gov.my/mdbentong
Majlis Daerah Lipis	Aras 4, Bangunan Lipis Centrepoint	27200 Kuala Lipis	Pahang	09-3121253		09-3123953	Molipis@hotmail.com	
Majlis Perbandaran Kuantan	Jalan Tanah Putih	25100 Kuantan	Pahang	09-5136177		09-5144452	KBPPK@MPK.GOV.MY	WWW.MPK.GOV.MY
Majlis Daerah Maran	Majlis Daerah Maran	26500 Maran	Pahang	09-4771411		09-4771511		
Majlis Daerah Cameron Highlands	Pejabat Majlis Daerah Cameron Highlands, Peti Surat	39007 Tanah Rata	Pahang	05-4911465	05-4912097	05-4911728	Majlis_cameron@yahoo.com	
Majlis Perbandaran Temerloh	Kompleks Pejabat Plaza Temerloh, Jln Ahmad Shah	28000 Temerloh	Pahang	09-2901477		09-2901664	MP@pahang.gov.my	www.phg.gov.my/MPTemerloh
Majlis Daerah Gerik	Jalan Haji Meor Yahaya	33300 Gerik	Perak	05-7912305		05-7912288	mdgerik@streamyx.com	
Majlis Daerah Kinta Selatan, Kampar	Kompleks Pentadbiran Majlis Daerah Kinta Selatan,	31900 Kampar	Perak	05-4671020		05-4671040	mdks-kpi@rm.net.my	http://mail.netmyne.com
Majlis Perbandaran Kuala Kangsar	Jalan Raja Chulan	33000 Kuala Kangsar	Perak	05-7763199		05-7761004	www.mpkkpk.gov.my	
Majlis Daerah Kerian	No. 1, Wisma MDK, Jalan Padang	34200 Parit Buntar	Perak	05-7161228		05-7169288	mdkerian@rm.net.my	http://mdkerian.perak.gov.my
Majlis Daerah Pengkalan Hulu	Majlis Daerah Pengkalan Hulu	33100 Pengkalan Hulu	Perak	04-4778148		04-4778735		
Majlis Daerah Selama	Majlis Daerah Selama	34100 Selama	Perak	05-8394201		03-8394377	mdspk@po.laring	www.epbt.gov.my/perak/mds
Majlis Perbandaran Manjung	Jalan Pinang Raja	32040 Seri Manjung	Perak	05-6871363		05-6882102	ydpmpn@rm.net.my	www.pmp.gov.my
Majlis Perbandaran Taiping	Wisma Perbandaran Taiping, Jln Taming Sari	34000 Taiping	Perak	05-8080777		05-8088957		www.mptaping.gov.my
Majlis Daerah Tapah	Jalan Stesyen	36000 Tapah	Perak	05-4011326		05-4012288	mdtaiah@streamyx.com.my	www.mdtaiah@pk.gov.my
Majlis Perbandaran Teluk Intan	Yang Dipertua, Majlis Perbandaran Teluk Intan, Jalan	36000 Teluk Intan	Perak	05-6221299		05-6212446	mdhti@rm.net.my	www.mpti.gov.my
Majlis Perbandaran Seberang Perai	Jalan Dato' Haji Ahmad Said	12000 Butterworth	Pulau Pinang	04-3105555	04-3105556	04-3326223		www.mpsp.gov.my
Majlis Perbandaran Pulau Pinang	Jabatan Perkhidmatan Perbandaran, MPPP, Dewan	10200 Pulau Pinang	Pulau Pinang	04-2633000		04-2633036	Zulkifli@mpsp.gov.my	
Majlis Daerah Kota Belud	Majlis Daerah Kota Belud, Peti Surat 8	89157 Kota Belud	Sabah	088-976529		088-976627	md.kb@sabah.gov.my	www.epbt.gov.my/sabah/mdkb
Dewan Bandaraya Kota Kinabalu	No. 1, Jalan Bandaran	88675 Kota Kinabalu	Sabah	088-521800	088-244000	088-268764	robert@dbkk.sabah.gov.my	
Majlis Daerah Kota Marudu Pitas	Peti Surat 129	89108 Kota Marudu	Sabah	088-661163		088-661323	arang kitar semula. Mungkin disebabkan Kota Marudu jauh da	
Majlis Daerah Penampang	Peti Surat 80	89507 Penampang	Sabah	088-711711		088-712588		www.sabah.gov.my/md.pgg
Majlis Daerah Marudi	P.O. Box 374, Marudi	96050 Baram	Sarawak	065-755755		086-755336	marudic@rm.net.my	www.marudic.sarawak.gov.my
Majlis Daerah Marudong dan Julau	Jln Makmah, Peti Surat 4	96507 Bintangor	Sarawak	084-693232		084-693973	tak nampak	
Majlis Daerah Lubok Artu	Jalan Penghulu Imong Arak Awan	96800 Engkilili	Sarawak	083-563015		083-563144	mdla-sec@rm.net.my	www.lubokartudc.sarawak.gov.t

The screenshot shows a Microsoft Access form titled 'Frm_A_PBT_Info'. The form is divided into several sections for data entry. The top section contains fields for PBT (Majlis Perbandaran Bentong), ALAMAT (Majlis Perbandaran Bentong, Jalan Ketari), POSKOD (28700), BANDAR (Bentong), NEGERI (Pahang), TELEFON A (09-2221148), TELEFON B, FAKS (09-2223729), E-MEL (mdbentong@pahang.gov.my), and LAMAN WEB (www.pahang.gov.my/mdbentong). The middle section contains fields for PENYERTAAN (NRP) and LAMAN WEB JABATAN. The bottom section contains fields for KAKITANGAN 1 (Roslan b. Md Yusof), KAKITANGAN 2 (Hamzah b. Ahmad), KAKITANGAN 3, JAWATAN 1 (PPKP), JAWATAN 2 (Pembantu Kesihatan Awam), JAWATAN 3, TELEFON 1 (09-2221148), TELEFON 2 (09-2221148), TELEFON 3, E-MEL 1 (my@pahang.gov.my), E-MEL 2, and E-MEL 3. The status bar at the bottom indicates 'Record: 11 of 58' and 'Form View'.

Figure 5.3.5 Example of “Frm A_PBT_Info” showing the LA’s Details and Key Personnel

The screenshot shows a Microsoft Access form titled 'Frm_B_lokasi_tong'. The form is divided into several sections for data entry. The top section contains fields for PBT (Majlis Perbandaran Petaling Jaya) and NEGERI (Selangor). The middle section contains fields for ALAMAT LOKASI TONG/PUSAT KITAR SEMULA (Pusat Kitar Semula, Jalan 10/7, off Jalan Gasing, Taman Jaya, 46000 P.J.), KENDALIAN (Treat Every Environment Special (T.E.E.S)), and PENGENDALI. The bottom section contains fields for TELEFON and JENIS PUSAT (aktif). The status bar at the bottom indicates 'Record: 1360 of 1636' and 'Form View'.

Figure 5.3.6 Example of “Frm_B_lokasi_tong” showing the Location of the Collection Centres

The screenshot shows a Microsoft Access form titled 'frm_C_kutipan'. The form has a light beige background and a blue header bar. The header bar contains the Microsoft Access menu bar (File, Edit, View, Insert, Format, Records, Tools, Window, Help) and a search bar. The form fields are as follows:

Field Name	Value
ID	
PBT	Majlis Daerah Kota Tinggi
NEGERI	Johor
PENGENDALI	Southern Waste Management Sdn Bhd
BAHAN DIKUTIP	Kertas, Plastik & Kaca

At the bottom of the form, there is a status bar that reads 'Record: 1 of 392' and 'Form View'.

Figure 5.3.7 Example of “Frm C kutipan” showing the Operator and What are Collected

The screenshot shows a Microsoft Access form titled 'frm_E_stakeholder'. The form has a light beige background and a blue header bar. The header bar contains the Microsoft Access menu bar (File, Edit, View, Insert, Format, Records, Tools, Window, Help) and a search bar. The form fields are as follows:

Field Name	Value
ID	
PBT	Majlis Daerah Jempol
NEGERI	Negeri Sembilan
STAKEHOLDER	Syarikat Southern Waste Management Sdn Bhd
ALAMAT	No.37A, Tingkat Atas, Jalan Ria, 72100 Bahau, Negeri Sembilan
TELEFON 1	06-4540640
TELEFON 2	
FAKS	06-4540896
PEGAWAI	
JENIS BARANGAN	

At the bottom of the form, there is a status bar that reads 'Record: 12 of 286' and 'Form View'. The Windows taskbar at the bottom shows the Start button and several open applications, including 'Draft Final.doc - Mic...', 'Maklumat_PBT (Data...', 'frm_B_jikasi_tong', and 'frm_E_stakeholder'.

Figure 5.3.8 Example of “Frm_D_stakeholder” showing the Stakeholders Attached to the LA

2) Stakeholders' Networking Database

(a) MHLG's Original Stakeholders' Networking Database

Prior to PP-I, MHLG had a Stakeholders' Networking Database that is basically a directory of information pertaining to the players involved in recycling activities. The information was accumulated over a number of years and its directory file documented in Microsoft Words format. For the purpose of PP-I, a softcopy of the directory file was obtained from MHLG for review and re-organisation into Microsoft Excel and Access format.

In the review, it was noted that the MHLG's directory had listings of about 1,623 names and addresses covering the LAs, NGOs, CBO, schools, shopping centres, private organisations, and the like. Further examination showed that the majority of the listings include about 151 shopping/commercial centres, 152 governmental agencies and 986 schools and education institutions.

Although these information and listings are good for general reference, they were generally not structured in a user-friendly manner; in addition, the list was not particularly useful as some of the details were incomplete and outdated. A number of players have moved or have changed their telephone contact numbers, and such changes were neither reflected nor updated in MHLG's directory. However, it must also be appreciated that it is impractical for MHLG to maintain, update and monitor the stakeholders given the large volume of information and parties to deal with. It should be up to the discretion of individual stakeholder to inform MHLG of any change in their organisation. Perhaps, in future MHLG might consider implementing a web-based directory system whereby the stakeholders would be able to log onto to the directory portal and update their information by themselves.

(b) Development of a Master Database for the Networking Directory

In order to expand the reach of the stakeholders' participation in the National Recycling Programme, MHLG posted a series of nationwide newspaper advertisements in mid-2005, entitled "Notice to Parties Involved in Recycling Activities". The advertisements invited interested parties to register their organisations with the Ministry and to be included in the new directory.

On examination of the responses received from the recyclers, it was noted that the request to register with MHLG was not particularly well received. Approximately 200 replies were received by facsimile, post and via email.

Since the initiation of PP-I, two sets of stakeholder data are available at MHLG – the first set pertains to the original stakeholders' directory (1,600 entries) in Microsoft Words Document format, and the second refers to the stakeholders' directory (195 entries) that is the result of information received in the August 2005 exercise requesting recyclers to register with MHLG.

It was decided not to combine the two directories into one main directory database, the main reason being that the information in the larger stakeholders' directory was much older and not updated. The registration directory developed as a result of the August 2005 exercise is relatively recent; hence, information and details provided by the players themselves are more useful and relevant. Notwithstanding the 2 different databases, both directories would be maintained under one master database.

The Master Database for the Networking Directory is in Microsoft Access Database with the given filename “Networking_Directory”. From there, the database was further converted to the “FORM” format for easier viewing and manipulation. The stakeholders’ directory is in the “frm_STAKEHOLDERS_DIR” database folder and the registration database is in the “frm_NEW_PLAYERS-REGISTRATION” folder. An example page of the registration directory is shown in Figure 5.3.9. The Master Database for the Networking Directory is attached as Appendix 4.

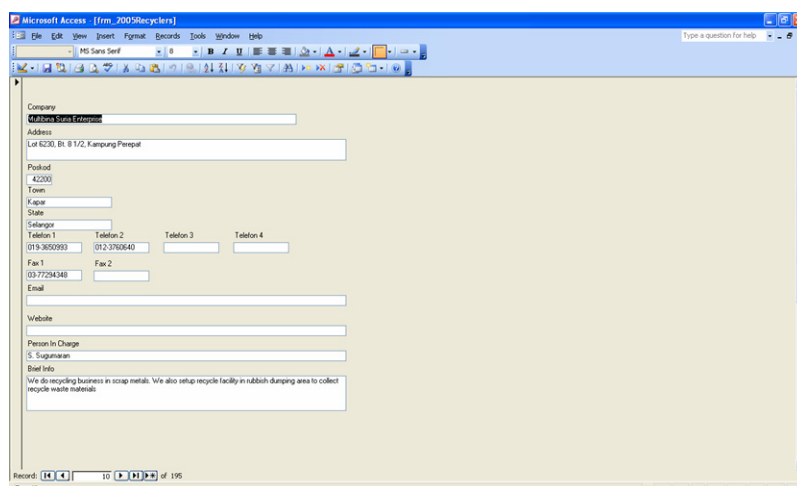


Figure 5.3.9 Example of Registration Page of Players

5.3.4 Capacity Development of MHLG

(1) Preparation of Manual of Data Management System

A summary instruction manual on “How to “View”, “Search” and “Add New” data / information into the database” is attached in Appendix 5.

(2) Conducting of On-the-Job Training

Various on-the-job briefing sessions were conducted with the counterparts from MHLG at the presentation and discussion sessions held on 11th July and 11 August 2005 and at JST’s 3rd Technical Workshop Session on 13th September 2005. In addition, two more training sessions were conducted on 26th and 27th October 2005, with the counterparts from MHLG on the usage of the IMS.

5.4 Evaluation of PP-I

5.4.1 Achievement Level

Based on the objectively verifiable indicators (OVIs) of the PDMs, the extent to which the Project Purpose and Outputs of PP-I have been achieved were evaluated as shown in Table 5.4.1. Whilst it can be considered that most of the Outputs were achieved, the Project Purpose, on the other hand, was partially achieved.

Table 5.4.1 Achievement Level of Pilot Project I

Project Purpose/ Outputs	OVI	Achievement Level
Project Purpose - To establish a Recycling Networking Unit (RNU) in MHLG to serve as a base for 3Rs data accumulation and dissemination in the country. - To enhance the capacity of MHLG to monitor SWM & 3Rs activities at federal level.	- Number of LAs and other stakeholders submit the 3Rs format to RNU in MHLG - Number of LAs that responded to MHLG's questionnaire survey in its attempt to set up a LA Information Database. - Organisation of MHLG's existing information into a master database and "Networking Directory" - Number of trained staff assigned to the RNU	The Project purpose was partially achieved. Under the PP-I, the RNU was established in MHLG, and a new reporting format for the LAs was formulated to improve data collection and systematise the information forwarded by the LAs and at the same time, to enable MHLG to manage the data more effectively. However, only 4 of the 10 participating LAs submitted their reports during the trial period. A questionnaire requesting for general information about the LA, its recycling programme and list of stakeholders was sent to 104 LAs under PP-I; only 57 LAs responded. A Master Database was created under RNU to organise existing information available at MHLG on 3Rs activities of LAs and stakeholders. To date, 195 sets of information submitted by stakeholders are kept in the database. At least 3 staff from the Recycling Unit was assigned to the RNU. They were briefed and trained to operate, maintain and update the Database.
Output 1: To establish the data management system on solid waste management & 3Rs at national level.	Reporting forms on waste generation amount, 3Rs quantities data and 3Rs activity practices are prepared/ finalised.	New reporting procedures and forms to be used by the LAs were developed based on the survey on waste flow in Phase 1. The new reporting format from LAs, and examples of Japan, were reviewed at a number of workshops with MHLG, the 4 model LAs, Alam Flora, and Southern Waste, and approved at the meeting with the 10 LAs that participated in PP-I.
Output 2: Recycling Networking Unit (RNU) is established in MHLG	No. of RNU staff	A temporary PP-I workstation for the RNU was set up in the Bilik Kitar Semula at MHLG. Officers from the Recycling Unit of MHLG attended and participated in meetings and discussions with consultants and LAs. Briefing and training in the operation of the IMS and updating the Master Database was provided also by JST. Further, an officer was sent to Japan under the aegis of this project for training in December 2005.

Project Purpose/ Outputs	OVI	Achievement Level
Output 3: 3Rs related information is published by RNU.	No. of 3Rs related information brochures, directory booklets and education & awareness leaflets are published.	Information on 3Rs activities in LAs were compiled into Microsoft Access Database and published. A Stakeholders' Directory was also prepared and kept in the master database.
Output 4: Capacity of MHLG C/Ps is developed.	Number of staff participated in training workshop.	The Counterpart leader and his assistants had conducted "on-the-job briefing sessions" at two (2) presentations and discussions held on 11th July and 11 August 2005, and JST's 3rd Technical Workshop Session on 13th September 2005. Two more training sessions were conducted on 26th and 27th October 2005 for them on the usage of the IMS.

5.4.2 Evaluation by OVIs

Table 5.4.2 Evaluation of PP-I

Criteria	Evaluation
Relevance	The overall goal and project purpose of PP-I is relevant to MHG's policies to promote waste minimisation. The Information Management System attempts to document, as much as possible, all the recycling activities from the various stakeholders. Since recycling activities covers a broad spectrum of interrelated activities from collection to transfer, processes and disposal, any information collated from these activities would be relevant to MHLG and other interested parties. The newly created Local Authorities Information Database was set up to enable MHLG to maintain, monitor and update details of waste minimisation efforts at LA level. This supports MHLG's policy towards better information and control over waste minimisation in the country.
Efficiency	The main objective of PP-I is to increase the efficiency of data collection and data analysis so that accurate information can be used to determine the "recycling efficiency" of the whole country. Under the activities of PP-I, two major components were introduced: 1. A system to collect recyclable data more effectively and efficiently by requesting the LAs to collect and collate data from the receivers and traders. The data would be presented in digital format and emailed to MHLG for analysis, thus reducing the need for manual data entry. 2. A system to increase the participation of the public and other players through registration with MHLG and be included in the stakeholders networking database. The stakeholders' information has now been documented in digital format for ease of reference. This has made the networking procedure more efficient, whereby MHLG is able to access the information much easier, and thus reduce the time needed to conduct paper searches.

	With the data and information in digital format, in future MHLG could post them onto their website for others to access, thus widening the access and increasing participation. This also becomes a more efficient way of publicising and promoting recycling.
Effectiveness	Project purpose to set up a Recycling Networking Unit (RNU) in MHLG to function as a base of 3Rs data accumulation and dissemination point in Malaysia and Capacity Building of MHLG Staff to monitor SWM and 3Rs activities in Federal level is partially achieved. Under the PP-I, the RNU was established in MHLG, and the new recyclable collection method was developed to improve data management more effectively. The Master Dtabase was also created under the RNU to collate and disseminate information on 3Rs activities of LAs and stakeholders. However, the responses from the LAs on the new reporting format were not encouraging. Only 4 of the 10 participating LAs submitted their reports during the trial of new reporting format. The others cited lack of manpower resources and time as their main reasons for submitting their report. This result indicates that urgent need for capacity development of officers in LAs as well as the improvement of national system. The systems established under PP-I were handed over to the counterpart from MHLG, and they had acquired sufficient skills to maintain the system through various on-the-job training. It can be evaluated that capacity of MHLG to monitor SWM & 3Rs activities in Federal level is enhanced.
Impact	Judging from the feedback from counterparts, it can be concluded that this pilot project gave following positive impact on relevant party, especially MHLG. Positive Impacts: a. More structured system to track status of 3Rs activities in the country. b. More convenient and user-friendly system to collate and disseminate information was established. a. More structured system to track status of 3Rs activities in the country. At present, little is known of the recycling activities of the various stakeholders. If information and data can be collected from these groups and analysed, it will have a great impact on our understanding of the status or recycling and its achievements in the country. b. More convenient and user-friendly system to collate and disseminate information was established. As PP-I attempt to establish better data collation and dissemination methods, it will provide greater and easier access to information. The general public and stakeholders will be wiser and well informed and thus will increase their participation in recycling activities. This will have a great impact on the increased collection activities and reduced waste being disposed at landfills. However, it was noted that the present impact was more on MHLG and the LAs realisation that more work will have to be done in order to satisfy the PP-I's reporting requirements. MHLG and the LAs should realise the importance of collecting more related information and data, even though it may be more work for them.
Sustainability	The information management system, as its name suggest, is to manage information. The database must be constantly monitored and updated.

	However the sustainability of such human-machine interface is highly dependant of whether there is the well to continue or are there adequate personnel or experts to manage the system. However, history has shown that Governmental bodies tend to loose interest in maintaining such systems, generally due to lack of commitment, dedication and constant staff rotation and changes. Nevertheless, MHLG should examine their priorities and assign suitable personnel to maintain the systems. This also applies to LAs and other stakeholders.
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5.4.3 Lessons Learnt and Recommendation

(1) Lessons Learnt

1) Data Collection Method

The key issues with the present data collection and reporting methods of MHLG is the lack of a structured procedure. Generally, data and information from stakeholders were collected in ad-hoc manner from a few collection centres and from a small pool of players such as schools and residents associations. The involvement of the key players such as the private collectors and traders were not realised and included.

There was also the tendency of LAs to rely mainly on their sub-contracted solid waste concessionaires for information, rather than extend their networking to include other players within their area. As such, vital and useful data were not captured. This probably resulted in presenting a scenario where recycling activities is relatively inactive and lacklustre. It was found that, in actual a fact, the recycling activities in Malaysia are much more healthier than is portrayed to be, although the level of recycling activity and number of players is not known due to lack of information and knowledge of their activities.

2) Uniformity and Streamlining of Reporting Format

The analysis of the reports received during the new reporting system trial indicated that the new format used for reporting collection is workable. Indeed, useful information and new insights into the recycling activity and players at the local level were revealed from the feedback. The results also showed significant improvement and rise in the quantities of recyclables collected. It also increased the LAs networking amongst the local recyclers and other agencies. The trials should be continued further so that more data can be gathered and analysed. Perhaps the trials could also be extended to other willing LAs for adoption and tested.

3) Manpower, Capacity and Training

This trial also showed that only 4 out of 10 LAs managed to submit their reports. This could be an indication of the problem faced in the LAs – namely, manpower and/or capacity of officers. It is recommended that MHLG ensure the LAs are being motivated and to encourage the LAs to be more proactive and to adopt the new reporting format and to try to collect as much relevant data from the stakeholders. In return, MHLG should assign fulltime-dedicated officers to continue with the monitoring and management of the various established systems, and to continue to analyse the data and present the statistics for others to reference.

(2) Recommendations

1) Updating of Database

The databases are only useful if they are constantly monitored and updated. Such tasks should be carried out periodically and MHLG should ensure that the LAs and the other stakeholders submit new information of changes and updates regularly.

It may not be practical for MHLG to contact all LAs and stakeholders through the telephone, however MHLG should establish a updating reminder system to remind LAs to provide their updated information on a twice-yearly basis. Such could be done via email or letter reminders, or via newspaper advertisements for the other stakeholders.

2) Continuation of Pilot Project Work

Since the Pilot Project, PP-I, was only scheduled for a short period of just three (3) months, not much data and information were received. Although some analyses were carried out on the few available data, the data were not sufficient to draw any conclusion to the progress and status of the PP-I activities. These activities should be developed further and be monitored and updated continuously.

The proposed actions to be developed and continued are as follows.

(a) Continuation of “New Reporting Format” Trials.

Due to time constraints and lukewarm response to the new reporting format, only 4 of the 10 trials candidate LAs submitted their recyclables collection data in the new format.

It was noted that in order to fill in the data according to the new format, a lot of additional data collection work will have to be carried out by the LAs. It was also noted that some LAs do not have the personnel and taskforce to carry out such work. However such shortcomings could be overcome if the LAs are more committed to the recycling programme. The LAs should start planning for the future and should establish new recycling units within the LAs and allocate sufficient personnel for the tasks.

It is suggested that MHLG should also encourage the LAs to be more active in the recycling programme, and participate in the “trials”, and eventually encourage other LAs to follow suit. Since the data and information will be collected and analysed by MHLG, it has the ultimate responsibility to ensure that the LA continues with the submission of the regular reports. On receiving the reports, MHLG should also continue with the databasing and analysis of the data and present the statistics for others to reference and appreciate.

(b) Continuation of “LAs Information Database”

The PP-I has set up the LAs Information Database containing valuable information of the LAs and their recycling related activities. Although not complete, i.e. only 56% of the total of 104 LAs have submitted their details, nevertheless what information that was received were extremely useful and relevant. MHLG should encourage the remaining LAs to submit their information soonest.

It must be appreciated that the database is as useful as long as the information in it are

constantly updated. MHLG should ensure that the LAs should submit new information of changes and updates regularly. MHLG should, at least twice a year, send reminders to the LAs to update their information. Alternatively, MHLG could consider upgrading the data gathering system to use the Internet web-based technology to manage the information. Such system will require the set up of a web-ready system with the aide of an information management software, to be published in MHLG's official website so that LAs could access to the database and do the updates online. Furthermore, the management software can be set to send reminders to LAs that have not responded, and also send out new surveys and invite others to response. With this web-based information system, others can also have access to the information by just logging on to the MHLG's website.

(c) Continuation of "Stakeholders Networking Database"

The stakeholders networking database has been created but it is only useful if the information in it are updated and accessible by others. At present, the directory of players is relatively small and further steps should be taken to increase the participation by approaching the LAs, the players and their related associations.

It was noted that the response to MHLG's invitation to the players to register their interest with MHLG was rather disappointing with only 195 submissions. This was due to lack of publicity and notification. Although the advertisements were published in various daily newspapers of different languages, they were hidden in the back pages of the newspapers. Not enough exposure was given to this campaign.

It is suggested that MHLG should re-launch this campaign and make use of the multimedia technology to present and advertise the programme. MHLG should consider upgrading the "paper" registration from and replaced with "electronic forms", and publish in the official website. All that is needed later is to inform the public to log-onto the website to access the forms and submit them electronically via the website or Internet. By doing so, MHLG will reduce a fair amount of paperwork and minimise the need to do manual data entry. With this system, MHLG can also monitor the players and issue reminders for them to update their details. Furthermore, this will also reduce the need for issuing large volumes of postal messages or letters. In the future, all correspondences, reminders or invitations should be conducted via the Internet.

(d) Proposal for Extension to PP-I Scope for Continuation

Under the present scope of PP-I, due to time and budget constraints, it was not possible to implement the full Information Management System that will encompass all the relevant functions such as setting up the web-based programme, data management, updating of MHLG's official website, liaison and dialogues with the LAs and the players, publicity and campaigns, etc.

However, with the prospects of additional project funded by MHLG or else, some of the activities could be implemented together with MHLG. As such, it is proposed that the information management should be expanded further to include management of recycling activities presently managed by MHLG. This included the operations and management of the "recycling centre" at MHLG.

3) Proposed Web-Based Data Management System

As previously explained, the key success of good data management system lies in its ability to be able to gather and manage vast resources of data efficiently and effectively.

The 2 main problems of data management are

- i) Inability to gather or collect information and data efficiently, i.e. difficulty in tracking the source, ensure data has been submitted, monitor reviews and updates.
- ii) Lack of manpower and automation resulting in data received not processed or analysed. Furthermore, most data are generally received in hardcopy format and required additional resources for manual data entry.

There is the need to address these 2 main problems so that the data collection function can be streamlined and to rely more on new IT technology, software control and the flexibility of the Internet and the world-wide-web (www).

The main purpose of having the web-based system is to make use of the conveniently available widespread networking facilities of the “www”. Once the dedicated website has been published and launched onto the “www” with the appropriate IMS application system, it can be accessed almost anywhere by approved personnel that is equipped with an Internet ready PC system.

With this system, special password controlled access privileges can be issued to participating parties so that they can access to the questionnaires and forms. With such tracking capabilities, all information received will be monitored and maintained in the master database storage system.

At MHLG’s side, as the administrator, MHLG is then able to access the database electronically and analyse them instantly without the need to do any additional paperwork.

The basic system is still subject to further study and investigation so that the actual system and applications can be determined in greater details. A system requirements study may be necessary to ascertain the hardware, software, web hosting, Internet security and personnel allocations to undertake the task.

The proposed basic structure of the web-based data management system is shown in Figure 5.4.1 and Figure 5.4.2.

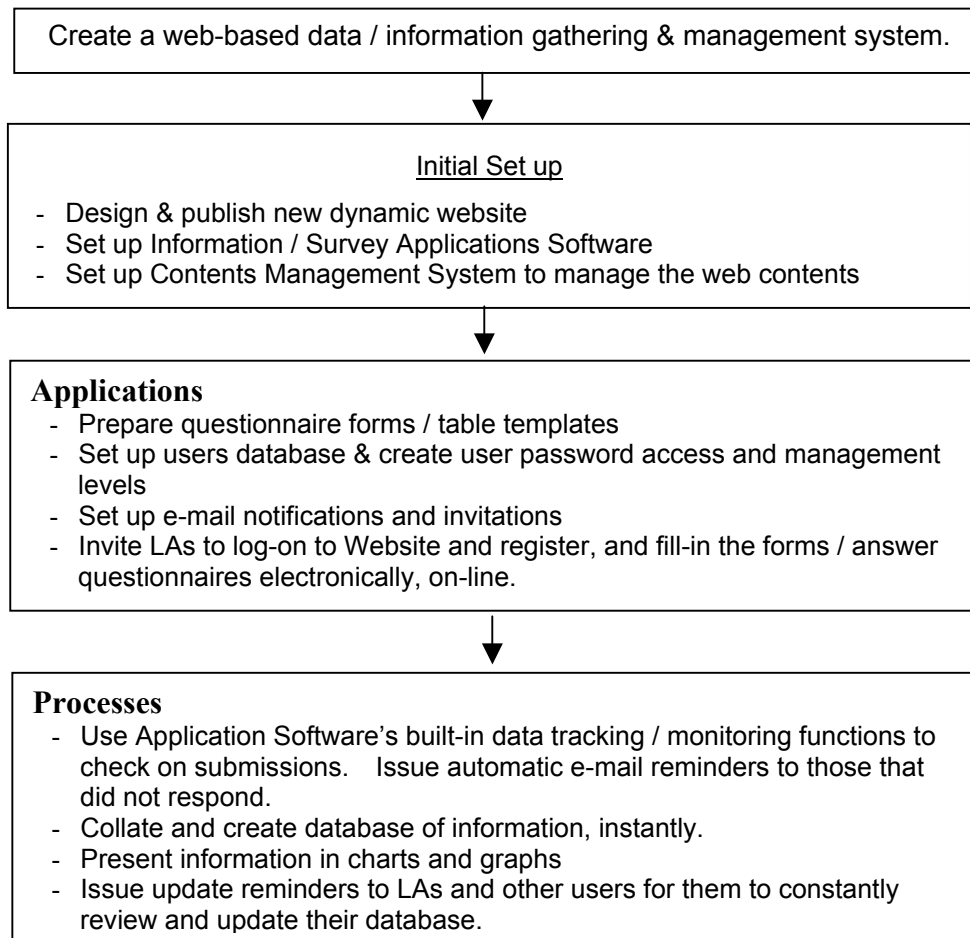


Figure 5.4.1 Basic Structure of Web-based Data Management System

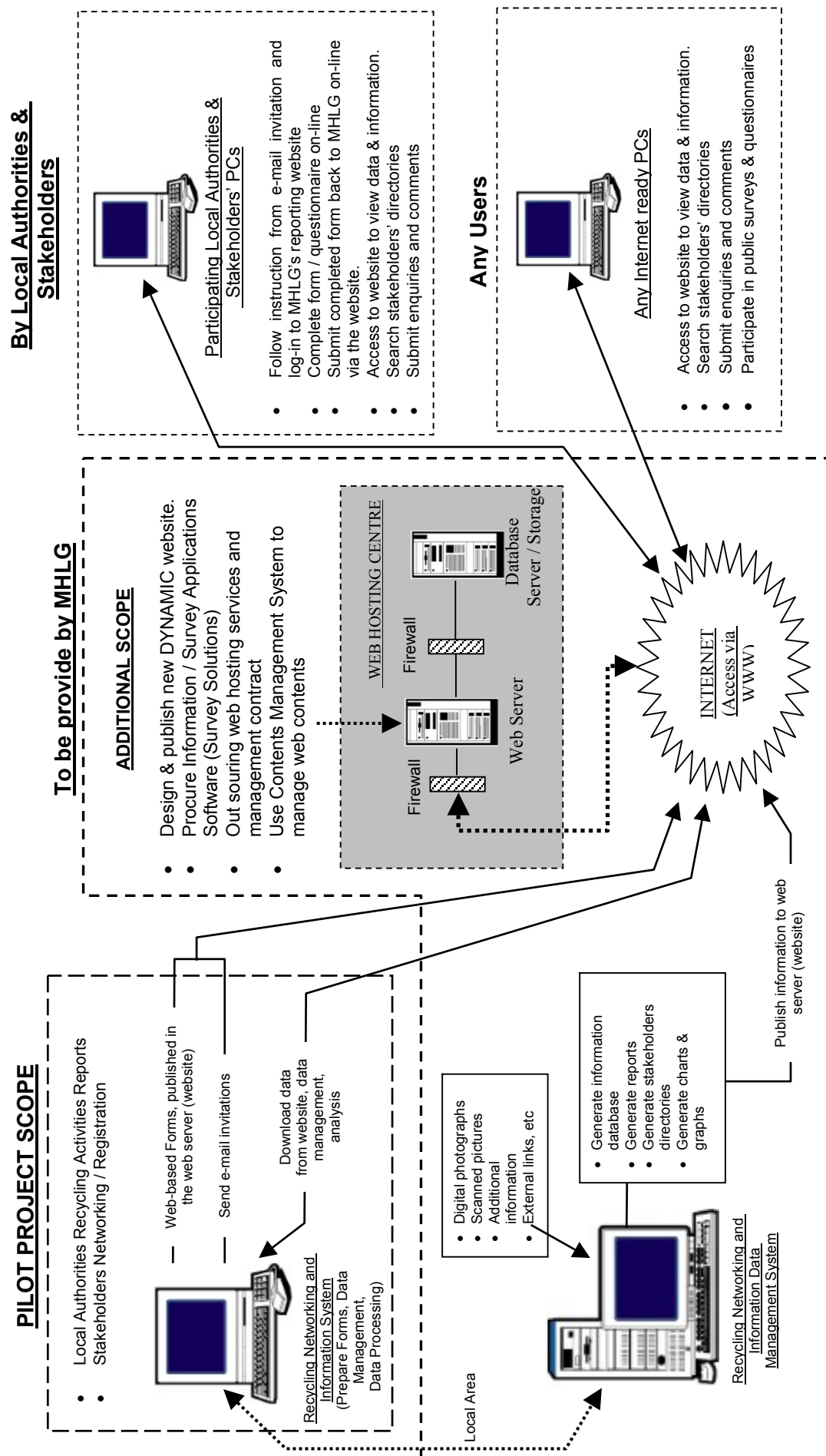


Figure 5.4.2 Proposal for Upgrading the National Recycling Information System (with Dynamic Website & Database)

CHAPTER 6

PILOT PROJECT II: LOCAL RECYCLING NETWORK AND SOURCE SEPARATION OF MSW

CHAPTER 6

PP-II: LOCAL RECYCLING NETWORK AND SOURCE SEPARATION OF MSW

6.1 Background

Under the National Recycling Programme, all participating Local Authorities (LAs) were requested by MHLG to set up and develop their individual recycling (3Rs) programme to promote and enhance the recycling activities within the boundaries of the LA. There are many stakeholders involved in waste minimisation and recycling activities, however, the relationship among them is not clear and therefore recycling networks should be established and led by the respective LAs to spearhead the effective recycling activities and to promote MSW minimisation. The Recycling information management system should also be established to be inline with the National Recycling Programme.

The introduction of source separation of municipal solid waste (MSW) is the main activity of waste minimisation. Such activities have been previously introduced in trial-scale in Petaling Jaya, Putrajaya and Subang Jaya. However, in order to enhance such activity and to achieve the target of waste minimisation, proper waste minimisation management system should be implemented including source separation, collection of separated recyclables and to delivery of recyclables to the intended processors/recyclers.

6.2 Outline of PP-II

PP-II comprises of two components:

- (1) PP-II-1: The Establishment of Local Recycling Network in Model LAs
- (2) PP-II-2: Source Separation of MSW

6.2.1 Project Purpose

The primary purpose of PP-II-1 is, firstly, to enhance or strengthen the practice of sustainable recycling under the leadership of the LAs, and secondly, to increase or improve the human resource capacity of the LAs to implement, coordinate and monitor recycling activity within their area of jurisdiction.

The project purpose of PP-II-2 is to increase the collection amount of recyclable materials separated at source.

6.2.2 Outputs

With the implementation of PP-II, the JICA Study Team intends to achieve the following outputs as outlined below.

(1) PP-II-1: Establishment of Local Recycling Network in Model LAs

PP-II-1 is designed to develop a Recycling Network and a systematic data management system in the 3 model LAs, namely, MP Pulau Pinang, MP Subang Jaya, MB Miri. The outputs below are anticipated from PP-II-1.

Table 6.2.1 Outputs of PP-II-1

Output 1	Data management system on SWM & 3Rs at the local level is established.
Output 2	Waste Minimisation Unit (WMU) is established in LAs (tentative-base).
Output 3	Recycling is carried out by stakeholders who participated in PP-II-1.
Output 4	3Rs related information is published.
Output 5	Capacity of LAs officials and regional 3Rs leaders are developed.

(2) PP-II-2: Source Separation of MSW

PP-II-2 is designed to introduce the practice of source separation at the source of generation as a crucial step to increase the recycling rate as well as the general awareness amongst the household and business entities.

Table 6.2.2 Outputs of PP-II-2

Output 1	Residents, communities and business entities carry out source separation.
Output 2	Recycling route of recyclables (paper, glass, can and PET) is established.
Output 3	Profit from selling recyclables return to communities/ institutions.
Output 4	Awareness of communities/ residents for waste minimisation/ recycling is enhanced.

6.2.3 Activities

The activities conducted to achieve the outputs targeted of PP-II are as follows:

(1) PP-II-1

To achieve Output 1, a waste flow survey was carried out to establish the baseline information of waste minimisation particularly on recycling in LAs. This was augmented with a questionnaire survey on the stakeholders operating within and around the LA's administrative area; the intention is to identify the waste flow and to obtain relevant information on stakeholders. Then, stakeholders' workshops to improve coordination and collaboration among the stakeholders identified during the survey were carried out were in each LA.

Based on the waste flow survey result, a data registration system was prepared in Microsoft Excel format as specified by the MHLG under PP-I. Collected data and information on stakeholders were compiled into a database, "Stakeholders' Directory" aiming at the formulation of network. These directories consist of a list of all the identified recycling agencies, and instructions how to prepare recyclables before bringing to those agencies, as shown in Appendix 9 (for MPPP), Appendix 10 (for MPSJ) and Appendix 11 (for MBM).

Activities undertaken to achieve Output 1 is as follows;

Activities 1: Establishment of Data Management System on SWM & 3Rs in Local Level	
1-1	Conducting of Survey on Present Waste Flow
1-2	Conducting of Stakeholders Forum to Clarify Role of Each Player
1-3	Establishment of Data Collection, Management & Reporting System
1-4	Set up of Database of Stakeholders & 3Rs Activities

To achieve Output 2 to 5, the following activities were conducted.

To achieve Output 2, the WMU was set up under the responsible unit in the model LAs. Computer, printers, phones line, fax as well as broadband Internet connection were procured for the WMU under the project. During the PP period, the WMU was staffed by LAs officers and appointed local consultants, and served as a base of all project activities, liaising with various stakeholders.

Activities 2: Establishment of Waste Minimisation Unit (WMU)

3Rs awareness promotions were conducted thorough several kinds of media in each LA, such as awareness brochures, and newspaper, aiming enhancement awareness on 3Rs among the public.

Activities 3: Publication of 3Rs Related Information

3-1	Development of 3Rs Awareness Promotions
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As part of capacity building of LAs officers, on-the-job training was carried out throughout the pilot project.

Activities 4: Capacity Development of LAs Officials and Regional 3Rs Leaders

4-1	Conducting of On-the-Job Training
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(2) PP-II-2

Under PP-II-2, source separation system was introduced and tested at several target areas selected in the model LAs.

In the planning process of PP-II-2, MHLG requested the JICA Study Team to select the target groups for source separation from a variety of groups ranging from households to office and business entities. After a number of meetings with the local consultants and representatives from the model LAs, MPSJ complex, South City Plaza in MPSJ, and Dynasty Hotel in Miri were selected as additional target groups for source separation project, in addition to the groups already identified.

To achieve Outputs1-4, the following activities were conducted in each target area.

Activities 1: Source Separation Programme
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1-1	Setting up of Source Separation System in Target Area
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1-2	Explanatory Meeting for Residents in Target Area
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1-3	Stakeholders' Workshop
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1-4	Public Awareness Activities
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1-5	Public Awareness Survey (only at households)
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1-6	Monitoring of Source Separation Practice
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6.2.4 Flow Diagram and Implementation Schedule

Flow Diagram and Implementation Schedule for the PP-II-1, and PP-II-2 are as shown below.

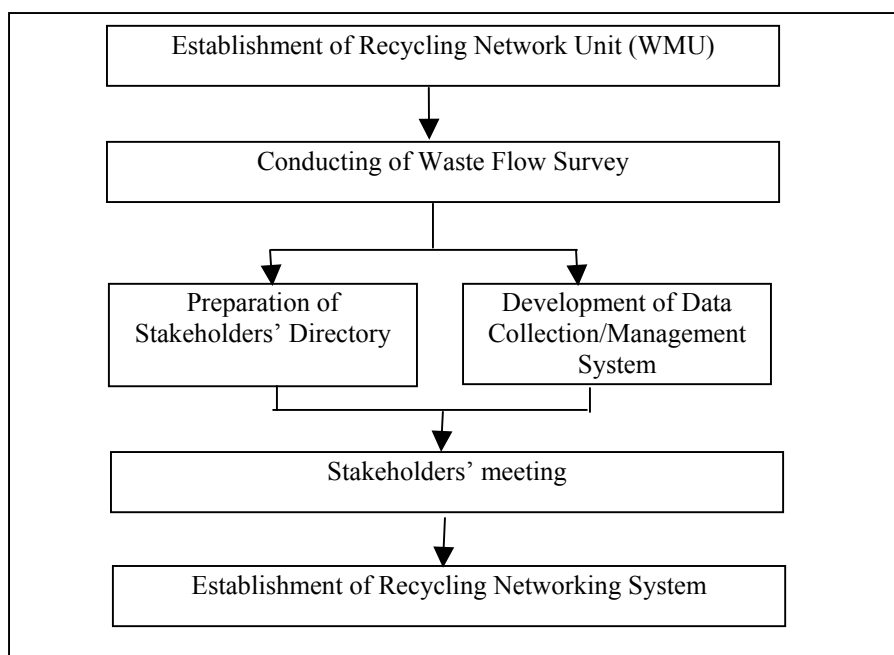


Figure 6.2.1 Flow Diagram for PP-II-1 : Recycling Network

Table 6.2.3 Implementation Schedule for PP-II-1

	Activities	Jun	Jul	Aug	Sep	Oct	Nov
1.0	Est. of Waste Minimisation Unit (WMU)						
2.0	Est. of Recycling Network in LAs						
2.1	Survey on waste flow						
2.2	Stakeholders workshop			△			
2.3	Preparation of Stakeholders' Directory						
3.0	Est. of Data Management System						
4.0	Development of 3Rs Awareness Promotion						
5.0	On-the-Job Training	←	-----	-----	-----	-----	→

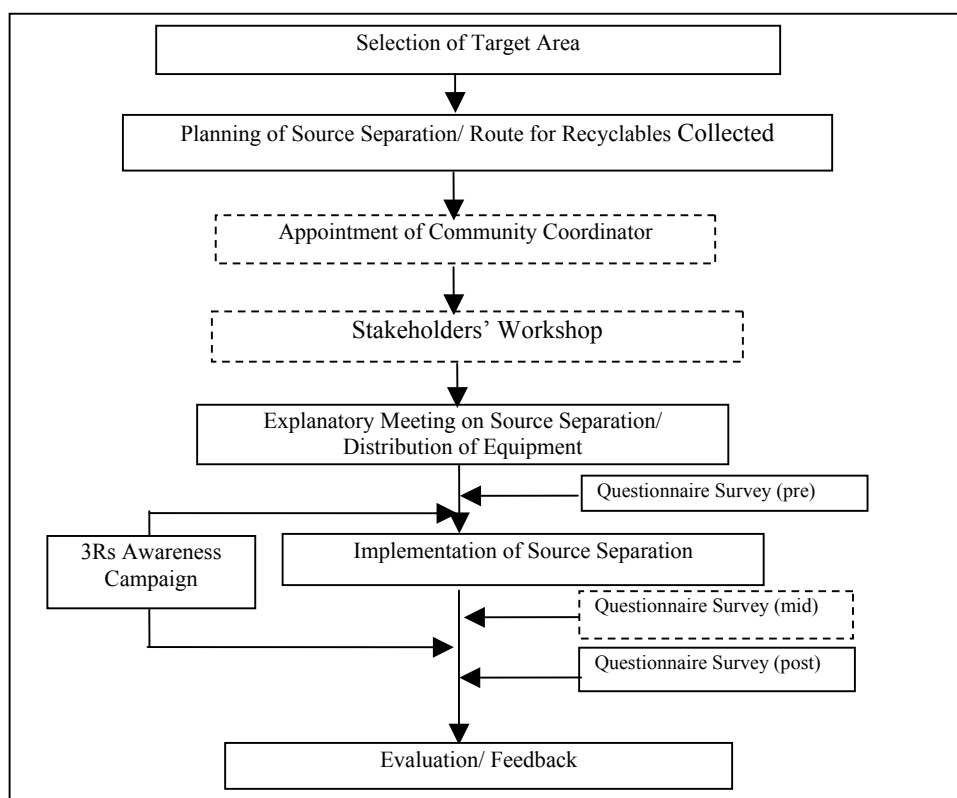


Figure 6.2.2 Flow Diagram for PP-II-2: Source Separation of MSW

Table 6.2.4 Implementation Schedule for PP-II-2

	Activities	Jun	Jul	Aug	Sep	Oct	Nov
1.0	Est. of Source Separation System						
1.1	Selection of target area						
1.2	Stakeholders workshop			△			
1.3	Planning of source separation						
1.4	Explanatory meeting		△				
1.5	Implementation of source separation						
2.0	Implementation of Campaign for 3Rs						
3.0	Implementation of questionnaire survey						
4.0	On-the-Job Training						

6.2.5 Organisation Frame Work of PP-II

Organisation framework for PP-II implementation is as shown in Figure below.

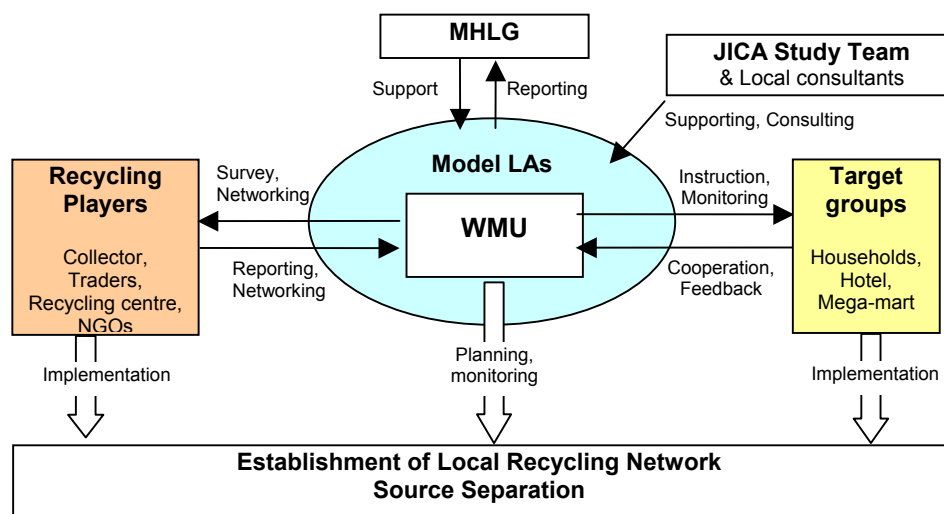


Figure 6.2.3 Organisation framework for PP-II

6.2.6 General Description of 3 Model LAs

This pilot project has been carried out at three (3) model LAs, i.e., Majlis Perbandaran Pulau Pinang (MPPP), Majlis Perbandaran Subang Jaya (MPSJ), and Majlis Bandaraya Miri (MBM). The location of the 3 model LAs and summary of current status of 3Rs activities in each LA are as shown in Figure 6.2.4 and Table 6.2.5, respectively.



Figure 6.2.4 Location of Model LAs

Table 6.2.5 Summary of Current Status of Recycling Activities in the Model LAs

	MP Pulau Pinang	MP Subang Jaya	MB Miri
Area	299.65 Km ²	161.8 km ²	977.43 km ²
Population	575,498 (2000) 667,500 (2004 estimates)	437,121 (2000) 484,925 (2004 estimates)	219,571 (2000) 245,600 (2004 estimation)
Total Waste Generation	TBA	445.6 tones/day 0.897 kg/cap/day	235.1 tones/day 0.87 kg/cap/day
Unit responsible for SWM	Special Tasks Unit in the Urban Services Department	Environmental Monitoring Unit under the Health and Urban Services Department	Recycling sub-unit under the Solid Waste Management Unit of the Public Cleansing and Maintenance (PCM) Section
No. of Officer	2 officers	3 officers, 1 administrative staff and 1 support staff.	1 health inspector
Tasks of Responsible Unit	• Give recycling talks to the public, factories and schools • Conduct exhibitions, recycling campaigns • Distribute the three (3) coloured bins	• Plan and implement recycling activities within MPSJ, incl. awareness campaigns, recycling buy-back scheme • Compile a list of recyclers in MPSJ area • Compile recycling data from various recycling centres, Alam Flora and MPSJ collections.	• To monitor and control the management of waste • To provide supports such as carrying out awareness campaign occasionally (MBM)
Local Recycling Network	State government implemented recycling programmes with the help of Penang Environmental Working Group (PEWOG). PEWOG implemented programmes include the community organisation, setting up of networks for recycling agents, etc.	There is an updating problem as the list of stakeholders in MPSJ's recycling network is not current.	There exists no formal network among various stakeholders, nor formal institutional set up to coordinate the recycling agents. A list of recycling agents were printed in the Local Agenda driven "Eco-Pack"
Data Management	MPPP uses its own format to collect data on recycling from registered recycling businesses. The data by the registered (by MPPP) recycling businesses are sent via fax to the WMU and collated, processed and analysed.	The compilation of recycling data by the Unit needs a more systematic approach, i.e. data should be kept in a database format for easier tabulation and generation of output.	There exists no structured and regular data collection system. Data related to 3Rs were collected based on ad-hoc request such as from the MHLG, LA 21 Miri etc. Data was compiled and filed in hardcopies while some data were prepared in digital format.

6.3 PP-II-1: ESTABLISHMENT OF LOCAL RECYCLING NETWORK IN MODEL LAs

This section outlines the PP-II-1: Establishment of Local Recycling Network in Model LAs. Article 6.3.1 discusses overall activities and results of PP-II-1, followed by detailed statements for major activities of PP-II-1 in the following articles; i.e. article 6.3.2, 6.3.3 and 6.3.4.

6.3.1 Overall Activities and Results of PP-II-1

Overall activities and results of PP-II-1 in each MPPP, MPSJ and MBM are described as shown in Table 6.3.1. Publications and web-sites prepared under PP-II-1 in each LA are as shown in Plate 6.3.1, Plate 6.3.2 and Plate 6.3.3, respectively.

Table 6.3.1 Activities and Results of PP-II-1

Components	Activities and Results			
	General	MPPP	MPSJ	MBM
Establishment of Waste Minimisation Unit (WMU)	Under PP-II, the WMU was set up under the responsible unit in the model LAs. Computer, printers, phone line, fax as well as broadband internet were procured for the WMU under the project. During the PP period, the WMU was staffed by LAs officers and appointed local consultants, and served as a base of all project activities, liaising with various stakeholders.	WMU was set up under the Urban Services Department in MPPP and 2 officers were appointed.	WMU was set up under the Health and Urban Services Department in MPSJ and main 1 officer and 3 environmental officers were appointed.	WMU was set up under the Public Cleansing & Maintenance (PCM) Section in MBM and 1 key officer was appointed. MBM processing to establish WMU officially.
Waste Flow Survey	A waste flow survey was carried out to establish the baseline information of waste minimisation particularly on recycling in LAs. A questionnaire survey was conducted on the stakeholders operating within and around the LA's administrative area, to identify the waste flow and to obtain relevant information on stakeholders.	Questionnaire survey with interview was carried out for 160 recycle related stakeholders. The current recycling rate is estimated to be about 16%.	Questionnaire was sent to 455 players and 104 answers were received. Annual collection amount is estimated as; 70,000 ton for recyclers, 100 ton for recycling centres and 2,600 ton for traders/ middlemen.	38 players were identified and 29 were answered the questionnaire by interview. Approx. 408 ton/month of recyclables are collected and most of them are exported including West Malaysia.
Stakeholders' Workshop	Stakeholders' workshops to improve coordination and collaboration among the stakeholders identified during the survey were carried out in each LA.	Workshop was held 3 Sept. 2005 with 230 attendants from various stakeholders.	Workshop was held 7 Sept. 2005 with 17 attendants from various stakeholders.	Workshop was held 8 Oct. 2005 with 36 attendants from various stakeholders.
Preparation of Stakeholders' Directory	Collected data and information on stakeholders were compiled into a database, "Stakeholders' Directory" aiming at the formulation of network. These directories consist of a list of all the identified recycling agencies, what is 3Rs, location of recycling centres etc.	The Directory listed 106 recycling agents categorised by items to be handled, 70 recycling communities, etc.	The Directory listed 39 recycling agents by types, 95 locations of recycling bins, 10 locations of recycling centres, etc.	The Directory listed 15 recycling agents by types, 57 locations of recycling bins, 10 locations of recycling centres, etc.

Components	Activities and Results			
	General	MPPP	MPSJ	MBM
Establishment of Data Management System on SWM & 3Rs Activities	Based on the waste flow survey result, a data management system was prepared in Microsoft Excel format as specified by the Ministry of Housing and Local Government under PP-I.	An e-based data collection and management system in line with the new reporting format from MHLG was established.	Data management system has established that encompasses all three aspects, i.e., collection, management and reporting together with the ICT Department.	Data management system in line with the new reporting format from MHLG was established. Three officers are appointed to process data management.
Development of 3Rs Awareness Promotion	3Rs awareness promotions were conducted thorough several kinds of media in each LA, such as awareness brochures, and newspaper, aiming at enhancement awareness on 3Rs among the public.	3Rs awareness brochures in each English, Malay and Chinese (4,000 copies). Website: www.rnumpp.net Regular press releases	3Rs awareness promotion 3Rs awareness brochure in English, Malay and Chinese Website: www.rnumpsi.net	3Rs information leaflet in English and Chinese (1,000 copies). Website: www.miri3r.net.my Regular press releases Radio talk on 3Rs Exhibition at campaigns etc.
On the Job Training	As part of capacity building of LA officers, on-the-job training was carried out throughout the daily activities of pilot project.	Regular OJT activities and capacity building for two (2) LA officials.	Five counterparts from MPSJ were assigned as taskforce members during the pilot project period.	Five counterparts from PCM Section of MPSJ were assigned as taskforce members.



Penang Island Recycling Directory

Total of 176 stakeholders are listed.



3Rs Awareness Leaflets
Published in three languages (English, Malay and Chinese) and distributed to the public at awareness campaign.



Website on 3Rs in MPPP

Plate 6.3.1 Publication under PP-II in MPPP



MPSJ Stakeholders' Directory
 Published in Malay, Total of 39 stakeholders is listed.

3Rs Awareness Leaflets (bottom)
 Published in three languages (English, Malay and Chinese) and distributed to the public at awareness campaign.

WHY RECYCLING ?

HELP THE ENVIRONMENT:

Recycling promotes the reuse of materials produced. This ultimately leads to less consumption of virgin materials. Thus conserving our natural resources. Recycling contributes also in limiting the amounts of waste in landfills which are becoming bigger over time. Badly managed landfill contribute to negative impact on the environment as well as health & safety of the local population.

Income from the sale of the recyclable materials collected will be channeled back to De Palma's resident committee

JICA STUDY TEAM
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 Persiaran Perpaduan, Jalan USJ 5
 47610 Subang Jaya

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Kindly contact us for queries or other information

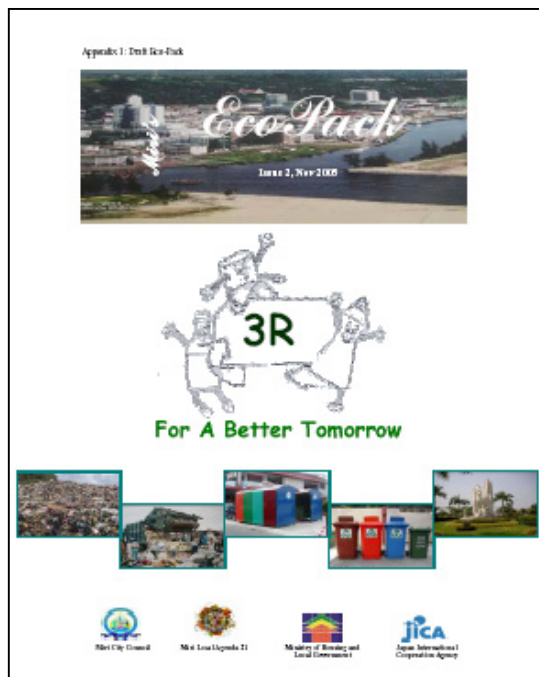
SOURCE SEPARATION PROJECT

DE PALMA Condominium

JICA STUDY TEAM

EXPLANATORY MEETING
 Thursday 18 August

Plate 6.3.2 Publication under PP-II in MPSJ



MBM Draft Eco-pack
Published in cooperation with LA
21 Solid Waste Reduction
Working Group.

Total of 15 stakeholders is listed.



Web-site for 3Rs Activities in Miri

Plate 6.3.3 Publication under PP-II in MBM

6.3.2 Establishment of Waste Minimisation Unit (WMU)

WMU was set up under the responsible unit in the model LAs. Necessary equipments including computer, printers, phone line, facsimile as well as broadband internet were procured for the WMU under the project. During the PP period, the WMU was staffed by LAs officers and appointed local consultants, and served as a focal agency of all project activities, liaising with various stakeholders. Tasks for WMU include;

- Data collection/management and reporting
- Implementation of Waste flow survey
- Planning/conducting campaign
- Promotion of networking among stakeholders
- Publication of stakeholders' directory
- Liason with Stakeholders

Outline of WMU set up in 3 model LAs are as follows;

Table 6.3.2 WMU Established in 3 LAs

	MPPP	MPSJ	MBM
Responsible Department	Urban Services Department	Health and Urban Services Department	Public Cleansing & Maintenance (PCM) Section
No of staff appointed	2 officers	1 main officer and 3 environmental officers	1 key officers

6.3.3 Waste Flow Survey

A waste flow survey was carried out in order to identify the waste flow and to obtain relevant information on stakeholders as baseline information of waste minimisation particularly on recycling in LAs. A questionnaire survey was conducted on the stakeholders operating within and around the LA's administrative area. Questionnaire form is attached in Appendix 6. The survey results of each LA are as described below;

(1) Waste Flow Survey in MPPP

Waste flow survey was conducted on the total of 160 stakeholders as shown in Table 6.3.3. Waste flow diagram identified through the survey is as shown in Figure 6.3.1. It was identified that 84% of the waste generated goes to the Pulau Burung Sanitary Landfill site, whilst 16% is diverted for resource recovery and recycling in MPPP.

Table 6.3.3 Number of Targeted Stakeholders in MPPP

Category of Stakeholders	Number
Centres	38
Traders	35
Recycling Centres/Station	23
Manufacturers	12
Households	52
Total	160

Table 6.3.4 Amount and Composition of Recyclables Collected in MPPP

Types of Recyclables	Total (tonnes/year)	Composition (%)
Newspaper	11,683,065	26.50%
Cardboard	26,662,107	60.47%
Plastic	3,000,517	6.80%
Scrap metal	1,739,366	3.94%
Aluminum	187,503	0.43%
Bottle/glass	778,847	1.77%
Clothes	41,763	0.09%
Total	44,093,168	100

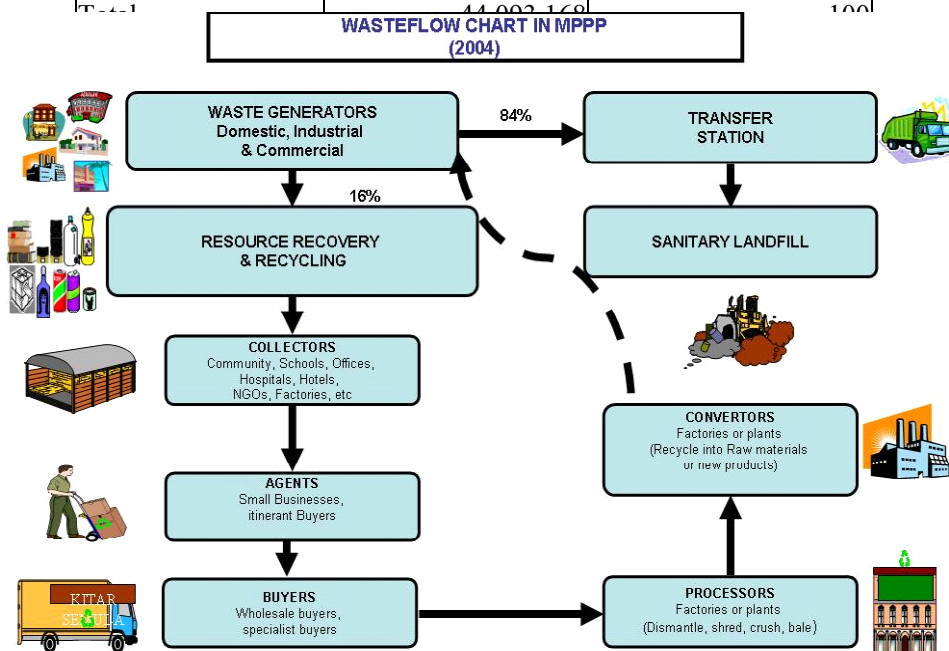


Figure 6.3.1 Waste Flow Diagram in MPPP

(2) Waste Flow in MPSJ

Waste flow survey was conducted targeted to 455 stakeholders as shown in Table 6.3.5. Based on the answer from those stakeholders, waste flow diagram in MPSJ was identified as shown in Figure 6.3.2.

Table 6.3.5 Number of Targeted Stakeholders in MPSJ

Category of Stakeholders	Number
Recyclers	52
Recycling Centres	10
Traders, Middlemen and Collectors	32
Manufacturing Industries	48
Commercial Establishments & Offices	143
Households	170
Total	455

Note: * included in Paper

Table 6.3.6 Recyclables Collected in Average by Type and Stakeholder in MPSJ
(tonnes/year)

Type of waste	Recyclers	Recycling Centres	Traders & Middlemen
Paper	8,676	44	1,136
Cardboards	12,120	41	556
Newspaper	19,080	*	*
Aluminium & Metal	9,240	5	708
Glass	12,288	6	-
Plastics	3,164	4	249
Rubber	6,000	-	-

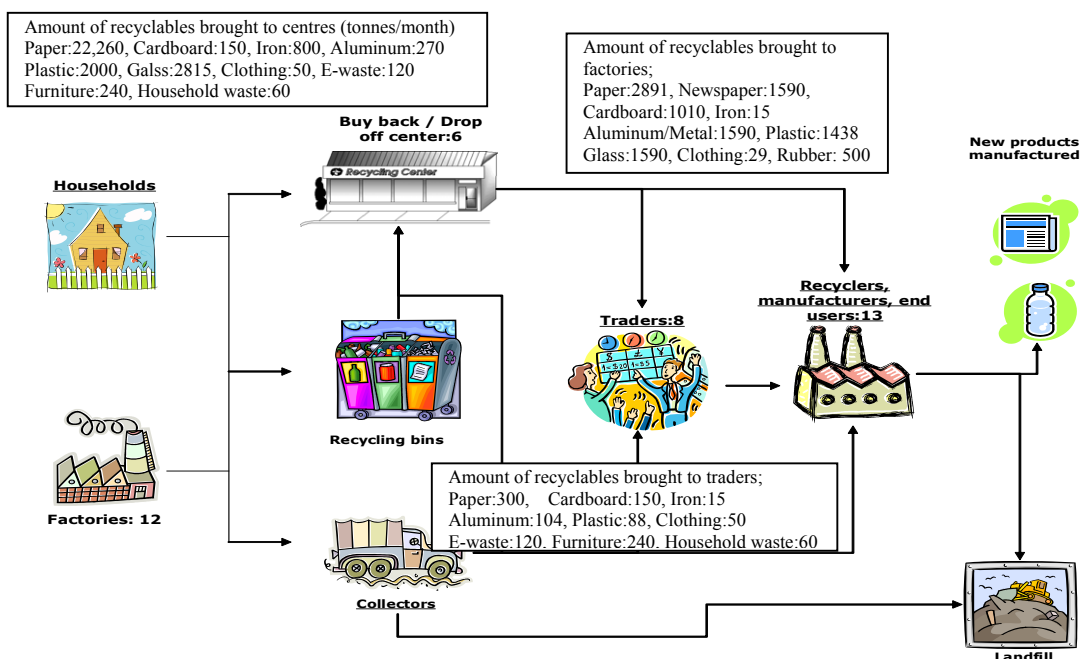


Figure 6.3.2 Waste Flow Diagram in MPSJ

(3) Waste Flow in MBM

Waste flow survey was conducted targeted to 38 stakeholders as shown in Table 6.3.7. The number of private recycling players identified in MBM through the survey was twenty (20). Waste flow diagram in MBM was identified as shown in Figure 6.3.3.

It was found that only one manufacturer who accepts plastic waste directly for recycling exists in MBM. For all other traders, collected recyclables need to be transported to West Malaysia or overseas for further processing and recycling.

Table 6.3.7 Number of Targeted Stakeholders in MBM

Category of Stakeholders	Number
Trader/Middle men	15
Recycling Station/ Centre	17
Manufacturer who accept recyclables	1
Scavenger	3
Total	36

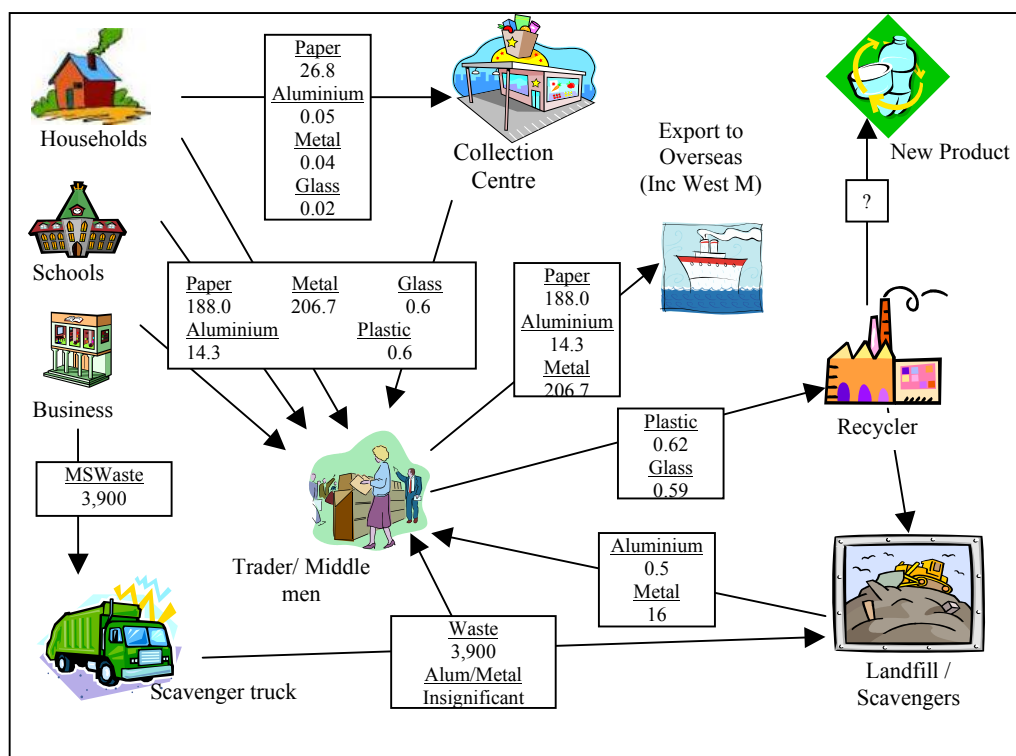


Figure 6.3.3 Waste Flow Diagram in MBM

(4) Factors Affecting to Promote Recycling Activities

In addition to the amount and flow of recyclables collected, factors affecting to promote recycling activities were also surveyed for three (3) types of recycling players; i.e. recyclers, recycling stations and traders/ middlemen. Table 6.3.8 shows the results of the survey in MPSJ and MBM.

In MPSJ, recyclers and traders pointed out that “*difference in price between virgin materials and recyclable materials*” and “*quantity of recyclable materials supplies*” will be critical conditions to promote recycling, while recycling station and trader pointed “*market demand of recycled products*” is important. In MBM, the first two items were indicated to be important conditions.

Table 6.3.8 Factors Affecting to Promote Recycling Activities

Factors	Over Total Respondents (%)				
	MPSJ			MBM	
	Recyclers	Recycling Station	Trader/ Middleman	Recycling Station	Trader/ Middleman
Difference in price between virgin materials and recyclable materials	46.2%	16.7%	50.0%	24%	32%
Quantity of recyclable materials supplied	46.2%	0.0%	62.5%	27%	28%
Market demand of recycled products	38.5%	50.0%	75.0%	19%	12%
Quality of recyclable materials supplied	30.8%	33.3%	25.0%	24%	12%
Awareness of the company in recycling	30.8%	66.7%	0.0%	3%	16%
Other factors	30.8%	33.3%	12.5%	3%	0%

6.3.4 Stakeholders' Workshop

Stakeholders' workshops were conducted in each model LAs in order to collaborate among the stakeholders identified during the survey. In the workshop, components of PP-II were briefed to the stakeholders, followed by the round-table discussion among the participants to obtain more information of the stakeholders, to exchange views to promote recycling further and to clarify the role of each player.

(1) Stakeholders' Workshop in MPPP

Stakeholders' Workshop was held on 3 September 2005, having 230 attendants from recyclers, NGOs, CBOs, households, LA officers, school teachers/ students, private companies, hospitals etc. During the workshop, components of PP-II were presented, followed by the group discussion on how to promote waste minimisation. Through the group discussion followed by the group presentations, participants exchanged the ideas for what they can do for 3Rs, and reconfirmed their role and responsibilities.

(2) Stakeholders' Workshop in MPSJ

Stakeholders' workshop was held on 7 September 2005, 17 people (7 from recyclers, 2 from manufacturing industries, 6 from traders, and 2 from residents association) attended the workshop. Recycling activities in MPSJ and the component under PP-II were presented to the stakeholders, followed by a round table discussion. Main findings highlighted in the workshop are summarised as follows:

- Project is good for MPSJ as it can provide stakeholders an avenue to give constructive ideas as well as a communication tool. However, respondents indicated that any programmes or activities should be done consistently for it to be sustainable;
- The current recycling situation in MPSJ is good but also stated that there is a lot of room for improvement. Areas that need to be strengthened are as follows:
 - Involvement of NGOs in recycling activities should be encouraged;
 - Create more awareness in recycling activities amongst residents; and
 - Strengthen data collection and networking amongst traders and recyclers.
- MPSJ must play a more aggressive role in assisting traders and recyclers to implement recycling programmes and activities in their area. MPSJ must also assist stakeholders by providing publicity as well as permit approvals for programmes and campaigns without much red tape.
- MPSJ should concentrate on awareness campaigns to households and schools on source separation projects.

(3) Stakeholders' Workshop in MBM

Stakeholders' workshop was carried out on 8 October 2005, having 36 attendances including recyclers, school teachers, government officers, and NGOs etc. During the workshop, briefing on PP-II and presentation of 3Rs experience at school were conducted followed by the presentation and discussion on the stakeholders' directory. In the workshop, MPPP officers were invited and presented experience in MPPP to enhance the capacity of MBM officers. Main findings highlighted in the workshop are as follows:

- To improve networking, it is suggested to involve stakeholders through the existing forum e.g. LA21 Solid Waste Reduction Group, Miri. Incorporated as examples;
 - Regular awareness campaigns or meetings;
 - Identify champions to lead the networking and drive for waste minimisation;
 - To establish suitable channels / forums for public to voice their comments/suggestions.
 - The setting up of a local recycling network in MBM will bring benefits to most of the stakeholders, as follows;
 - Greatly improve the awareness and knowledge of stakeholders on 3-R in Miri
 - Easier for MCM to control, coordinate and monitor the various players involved
 - Create opportunities to strike win-win cooperation among the stakeholders
- There are constraints facing 3Rs activities and future networking, for example;
 - Financial resources to implement and manage
 - Human capacity to implement – suggested to identify and involve specialist
 - Limited storage space for recyclables

6.4 PP-II-2: Source Separation of MSW

6.4.1 Component of PP-II-2

Under PP-II-2, source separation was introduced in several target areas in the model LAs. In the planning process of PP-II-2, JICA Study Team was requested from MHLG that targets for source separation should be selected from variety of groups, and should not only be households. After a number of meetings with local consultants and the model LAs, MPSJ complex, South City Plaza in MPSJ, and Dynasty Hotel in Miri were selected additionally as target groups for source separation project.

Table 6.4.1 shows outline of source separation system established and implemented in each target area under PP-II-2.

Table 6.4.1 Outline of Source Separation System Implemented Under PP-II-2

Target Groups	Site	Activities	Target Items	Equipments	Collector	Frequency
Terrace house	MPPP	Door to Door collection	Paper, Plastics, Metals, Glass	1 HDPE bin *2 separation	Private recycler	1 time/week
	MBM	Door to Door & Station Collection		1 plastic bag & boxes for papers *3 separation	NGO	1 time/ fortnight
					Garbage Contractor	1 time/week
Apartment	MPSJ	Station Collection			3 plastic bags & containers *4 separation	Private recycler
MPSJ Office Complex	MPSJ	Reduction of paper consumption	Paper	3 recycling bins	Alam Flora	1 time/ week
Mega-mart	MPSJ	Est. of buy-back centre	Paper, Plastics, Metals, Glass	Cabin	Alam Flora	Everyday
Hotel	MBM	SS by housekeeper & Guests			Recycling bins/ bags/ boxes	Private recycler

To capture the change in awareness on 3Rs among the public, questionnaire survey on awareness was undertaken targeting households in the 3 model LAs.

Flow diagram of PP-II-2 is shown in Figure 6.4.1.

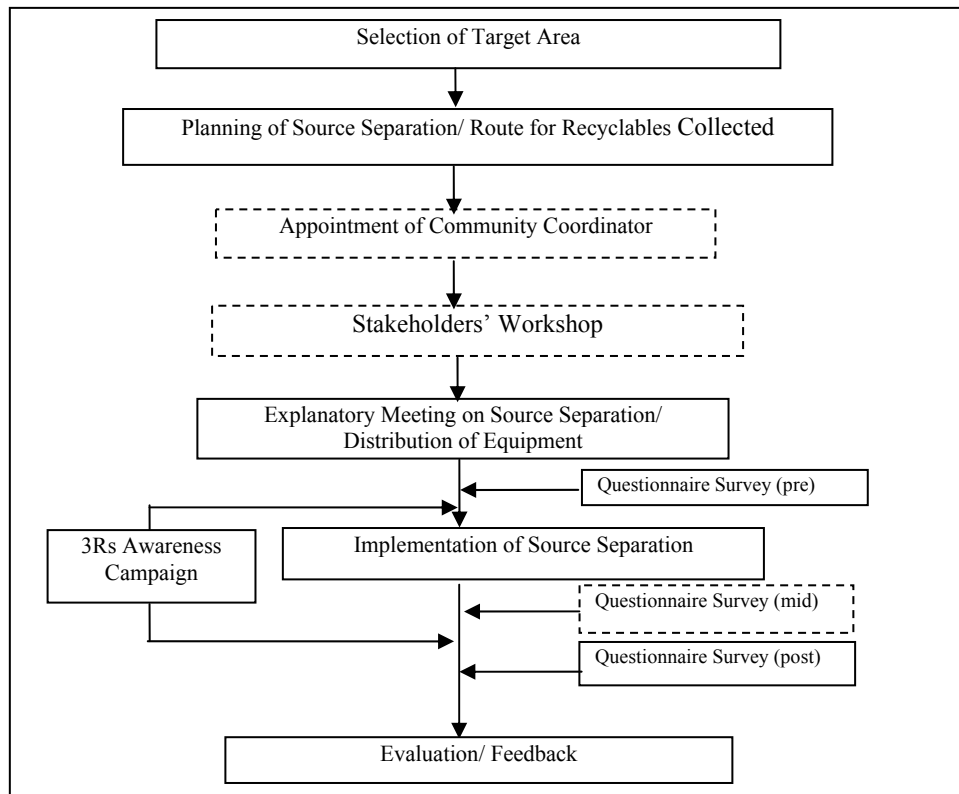


Figure 6.4.1 Flow Diagram for PP-II-2: Source Separation

6.4.2 Source Separation for Households (MPPP, MPSJ, MBM)

(1) Description of Target Area and Existing Recycling Activities

Based on the following selection criteria, one residential area in each of the 3 model LAs was selected as target area for the Pilot Project. General information and existing condition of waste disposal at the target area are as described in Table 6.4.2.

<Major Components of Selection Criteria >

- Types of houses, religious belief, racial mix,
- Accessibility to location
- Relevance to LA's 3Rs programme
- Presence of "Champion (local leader)"
- Cooperativeness and willingness of residents
- Presence of willing waste collector and recycling agent
- Past experience in recycling

Figure 6.4.2 shows current status of source separation activities in the target area identified by the awareness survey conducted before the implementation of the Pilot Project. It can be observed apparent difference among areas.

Table 6.4.2 Description of the Target Area

	MP Pulau Pinang (MPPP)	MP Subang Jaya (MPSJ)	MB Miri (MBM)
Name of Place	The Hillside Residential Area in Tanjung Bunga	De Palma Condominium	Krokop 10 area, Krokop 6 ara,
No. of Household	409 including 12 shop houses	288 units	184 (Krokop 10) 104 (Krokop 6)
Type of house	Terraced house	Apartment	Terraced house
Existing Condition of Waste Disposal/ Collection	Mixed wastes from individual houses and shop lots were collected door-to-door every alternate day by the private waste collector. All house hold and commercial waste were placed in an 80 litre HDPE green bin provided by the MPPP. Recycling activities were carried out informally. Recyclables separated individually were brought to recycling centres or Itinerant buyers.	Mixed wastes from tenants were brought down to the central collection point located in front of Block B, and collected every day by Alam Flora. Four (4) smaller garbage bins are located near each block. Newspaper and other papers were separated and workers employed by the apartment management company were collected door-to-door. But this was not formal recycling activities.	Mixed wastes from individual houses were collected three times per week by garbage contractor. Recycling activities was carried out irregular. A NGO, Buddhist Tzu Chi Merit Association collected the recyclables around twice a year. There were three recycling centre in public places within Krokop area, i.e. market and park, but those were not utilised, or just opened and have not been operated.



Houses and shops at Tanjung Bunga, MPPP



Houses at Krokop 10 (left) and 6 (right).

Plate 6.4.1 Target Area for Source Separation

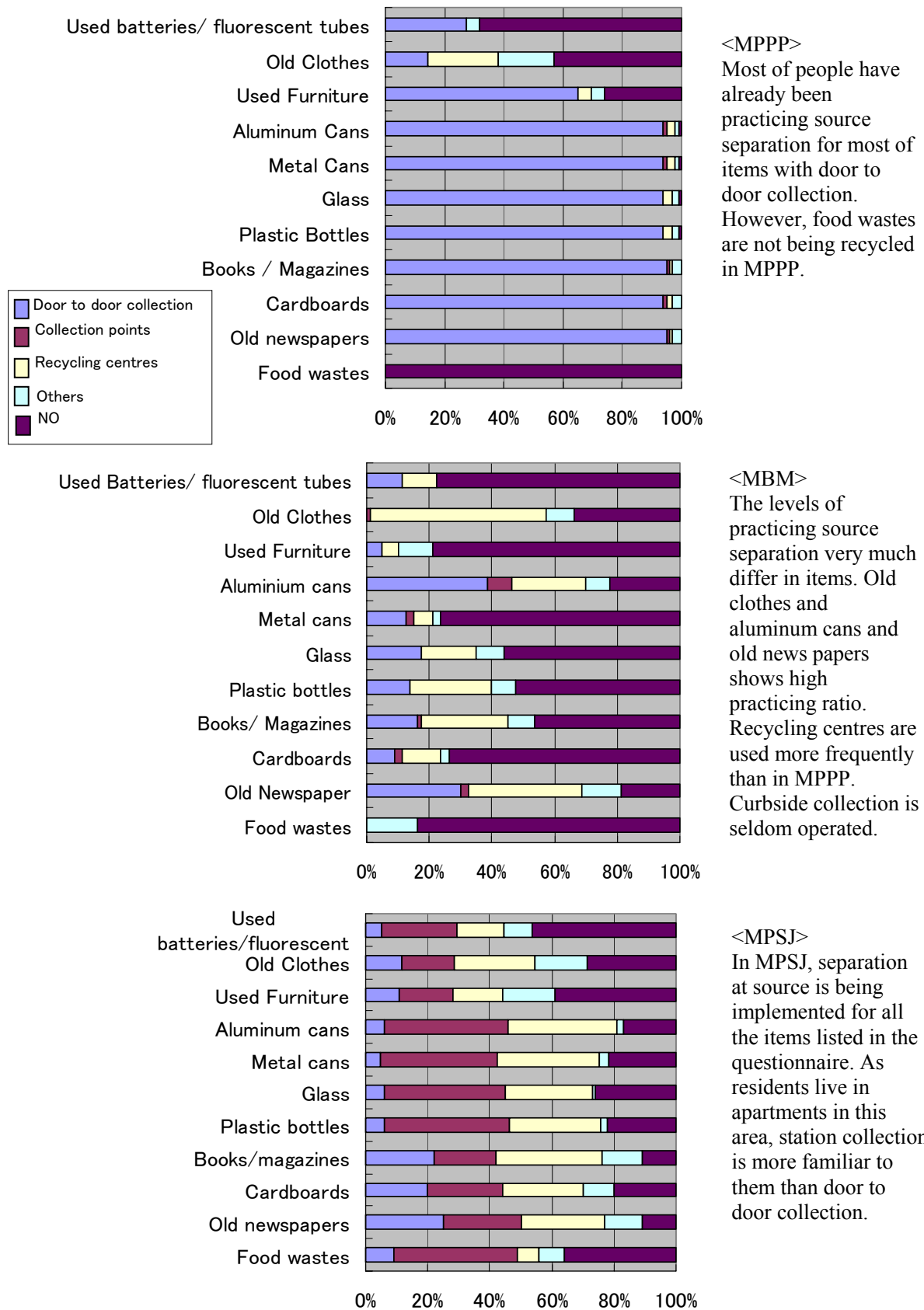


Figure 6.4.2 Households Undertaking Source Separation

Source: Pre Pilot Project Waste Flow Survey

(2) Source Separation Practice in MPPP

1) Implementation Procedure in MPPP

Activities implemented under PP-II-2 are summarised in Figure 6.4.3.

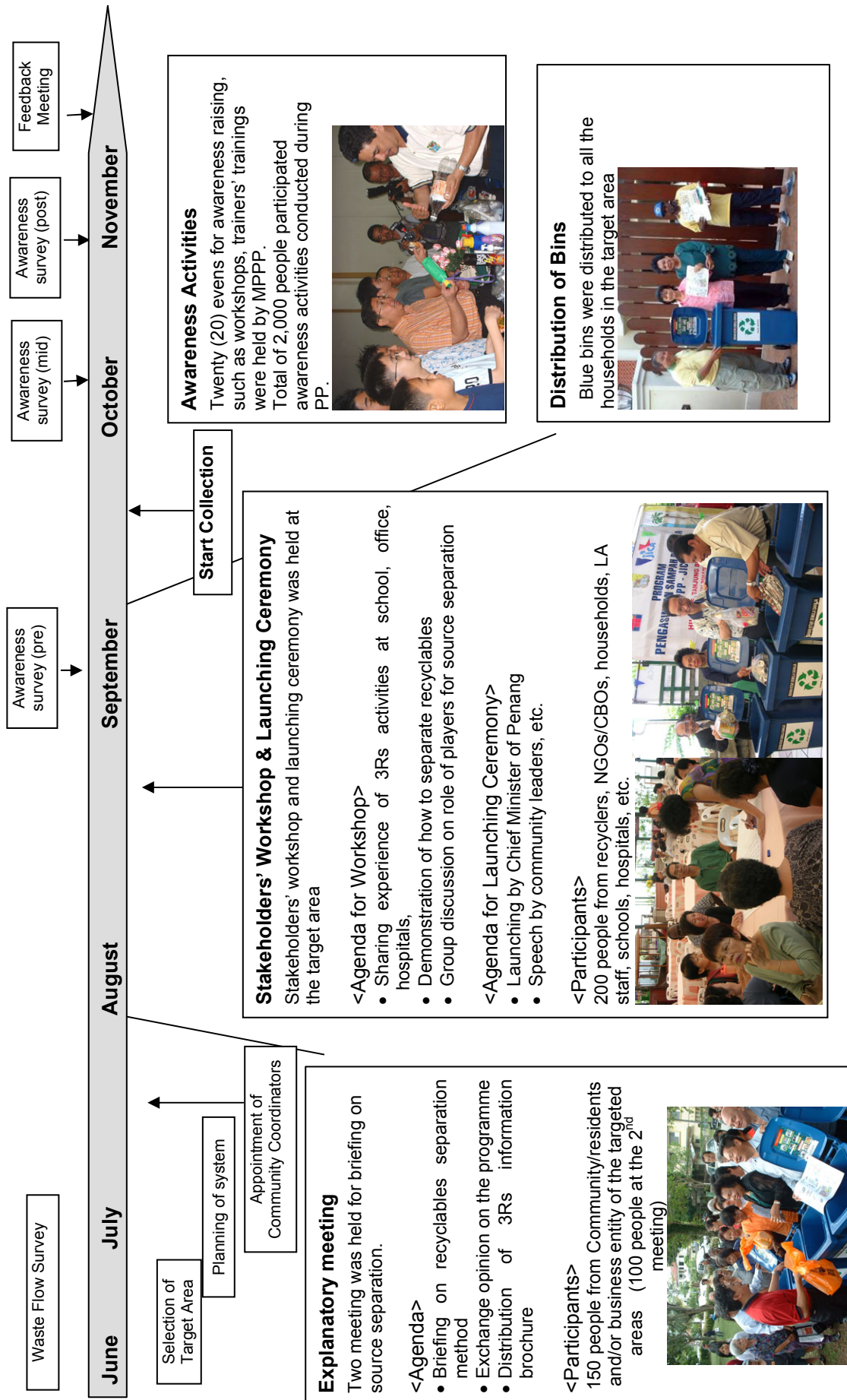


Figure 6.4.3 Implementation Procedures for PP-II-2 in MPPP

2) Source Separation System Introduced in MPPP

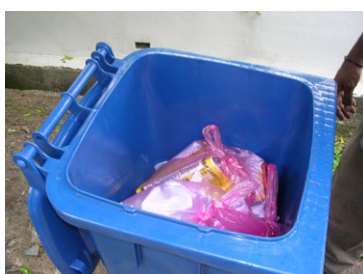
Source separation system set up and tested in MPPP is as described in the Table below.

Table 6.4.3 Source Separation Method in MPPP

Item	Contents
Collection Method	Door-to-door collection No permanent collection station set up in the area due to lack of suitable place.
Target Items	Paper, Plastics, Metals, Glass
Frequency	• 3 times per week for organic waste by existing waste collector • Once a week for recyclable items by an appointed recycling agent.
Equipments for source separation	• Organic waste: Green bins distributed by MPPP in early time • Recyclables: HDPE blue colored bins with waterproof stickers (distributed under this project) • No plastic bag was provided to the participating households. Residents use own plastic bags they got from the supermarket, etc.
Segregation method	2 Separation : Organic waste, Non-organic (recyclables) Residents separate recyclables from wastes, put in plastic bags by items and store in blue bin. Bulky items can be placed outside the blue bins.
Collector	Landcarve Enterprise (private recycler) The recycling agent plays a jingle during his rounds in the project area to create a festive mood and also announce the arrival of the recycling truck.
Collection Fee	No additional fee for collection (agents bear all the cost)



Blue Bin (for recyclables) and Green Bin (for Organic)



Residents put recyclables in a bin



Bring bins to the front of the gate on collection day



Appointed collector collects recyclables from blue bins



Plate 6.4.2 Source Separation Practice in MPPP

3) Collection of Recyclables

During the period from 14 August to 16 October 2005, recyclable collection was carried out 10 times. The quantity collected ranged from a low of 369 kg to a high of 865 kg per week. The average weekly collection amount was 487 kg. The amount of recyclables collected on each collection day is as shown in Table 6.4.4.

The source separation activities in Hillside area showed rather high participation ratio, between 23-35 %. The participation rate is calculated as the number of participating households at each collection day divided by the number of households that received the blue bins.

To raise participation ratio further, and to announce this activities to the public, several efforts were made, including workshops, launching of pilot project and 3Rs campaigns. Feedback meetings were also organised for the residents in Hillside area, in order to discuss the countermeasure to issues encountered during the project period. These meetings were very efficient to get residents more interested and involved in the project.

Table 6.4.4 Amount of Recyclables Collection in Hillside Area

(Unit: kg)

	14 Aug	21 Aug	28 Aug	4 Sep	11 Sep	18 Sep	25 Sep	2 Oct	9 Oct	Total
Paper	280	180	85	82	70	260	320	130	201	1,608
OCC	70	22	60	45	28	50	89	63	48	475
Glass	280	70	200	108	95	120	278	170	110	1,431
Plastic	88	55	102	60	60	60	83	78	61	647
Alumi- nium	15	7	8	5	5	7	8	5	28	88
Ferrous Metal	28	35	40	28	48	70	72	42	24	387
E-waste	0	0	0	45	0	15	15	28	8	111
Total	673	314	393	313	246	582	865	516	480	4,382
Participa tion Rate (%)	N.A	28	33	26	27	26	28	23	27	(Ave.) 24

Source: JICA Study Team Note: OCC:cardboard

(3) Source Separation Practice in MBM

1) Implementation Procedure in MBM

Activities implemented under PP-II-2 in MBM are summarised in Figure 6.4.4.

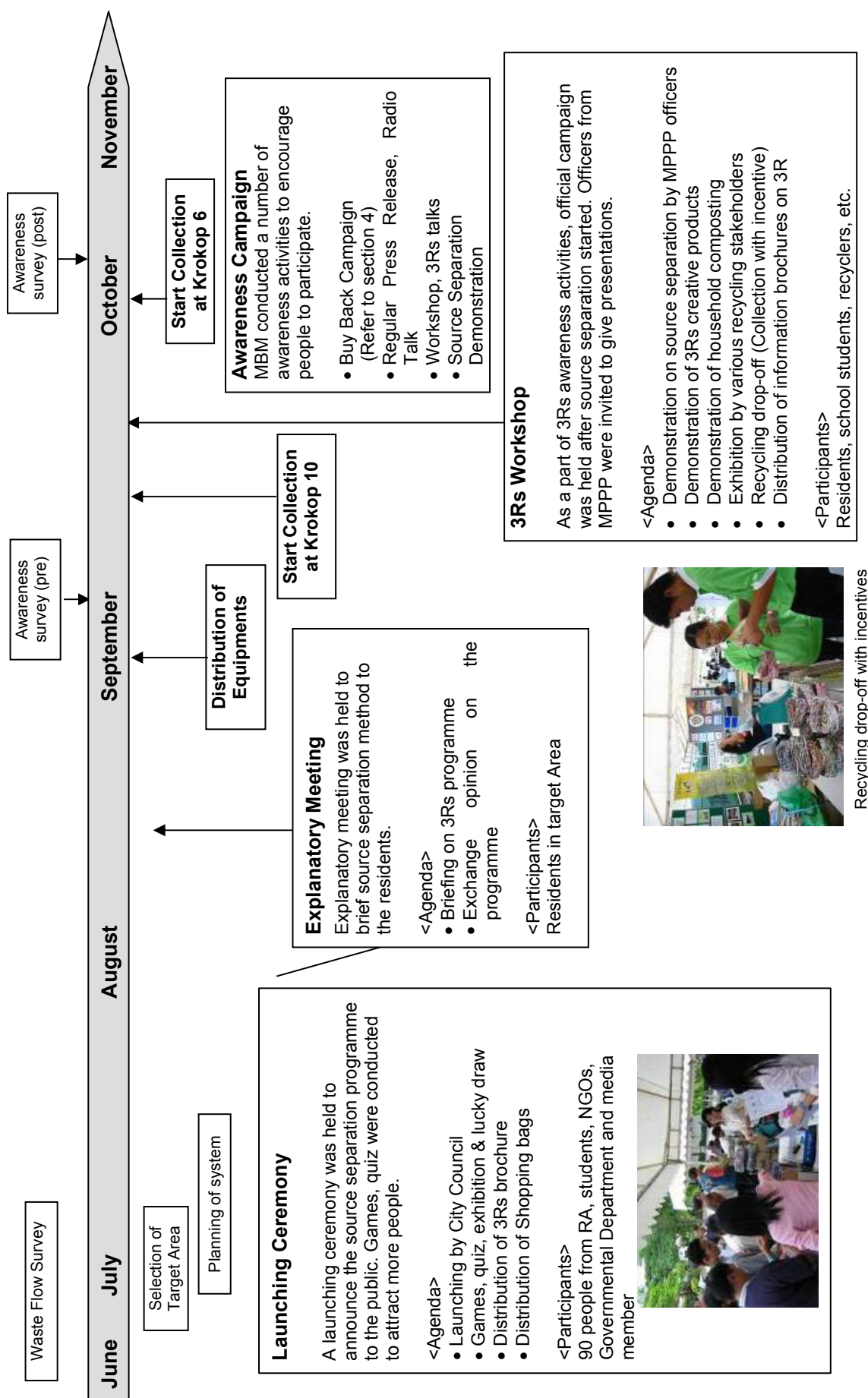


Figure 6.4.4 Implementation Procedure of PP-II-2 in MBM

2) Source Separation System Introduced in MBM

Source separation system set up and tested in Miri is as described in Table below.

Table 6.4.5 Source Separation System in Miri

Item	Contents	
Collection Method	Door to door collection and station collection	
Target Items	Paper, Plastics, Metals, PET bottles	
Target Area	Krokop 10 (184 households)	Krokop 6 (104 households)
Duration	4 months (Aug-Nov)	2 months (Oct-Nov)
Collector	NGO(Buddhist Tzu Chi) and MBM (collect by turns)	Garbage contractor appointed by City Council “Piggy Back” on normal rubbish route
Collection Frequency	<Door to door collection> • 3 times per week for organic waste by garbage contractor • Every 2 weeks (Sunday morning from 8am until 11am)	<Door to door collection> • 3 times per week for organic waste by garbage contractor • Once a week (Saturday) for recyclable items
	<Station collection> Every weekend at 2 drop-off centres	
Segregation method	3 Separation : Organic waste, Used papers (Newspapers, black & white papers, magazines), Other recyclables Residents separate recyclables from wastes and put in plastic bags (papers are put in a cardboard box). Recyclables are brought to outside on the collection day, and collected by garbage contractor/NGO. Residents can bring to drop-off station managed by NGO in their good time.	
Equipments for source separation	• Organic waste : bins • Recyclables : Collection boxes (carton box) (distributed under this project) • Used papers: Plastic bags (distributed under this project)	
Collection Fee	No additional fee for collection	



Plate 6.4.3 Source separation Practice in MBM

Apart from door to door, the drop-off collection points were operated in parallel, as alternative for public to recycle their waste. The identified centres include:

Table 6.4.6 Drop-off Collection Points for PP

Place	Management	Activities
Krokop 5	Buddhist Tzu Chi	Drop-off collection on Sunday from 11:00 am-12:00 pm
Krokop Market – LA 21 collection centre & car park	-	Used as storage point and the venue for regular awareness campaigns
Bulatan Park	Buddhist Tzu Chi	Drop-off collection on Sunday from 11:00 am-12:00 pm

One of the centres (Bulatan Park collection centre) had been beautified to improve the attractiveness under this pilot project (see pictures below).



Plate 6.4.4 Bulatan Park Collection Centre Before & After Painting Beautification

3) Collection of Recyclables

(a) Door-to-door collection

Initially, source separation programme was implemented at Krokop 10 with targeted households of around 200. However, the programme faced the problem of low response even in the middle of pilot project, it was decided to test additional source separation collection system and expand pilot area. Krokop 6 (nearby Krokop 10) was selected additionally in October 2005 as an extension of pilot project area. House types and racial, religious, academic mix of residents in Krokop 6 are similar to those in Krokop 10.

To increase residents' response, several awareness activities were carried out continuously, including regular press release on 3Rs activities, radio talk, exhibitions and 3Rs talk campaign, etc. MBM and the Study Team also made a big effort to identify the "Champion" for the pilot project, who can lead and encourage residents to participate. House-to-house visiting and source sorting activities were done together with Champion, which also increased the amount of recyclables collected and participation rate.

During the pilot project period (July to November 2005 for Krokop 10, and October and November for Krokop 6), recyclable collection was carried out 7 times in each area. Average amount of collected recyclables at Krokop 10 and 6 are 1,355kg/time and 68

kg/time, respectively. Amount of recyclables collected and participation rate in Krokop 10 and 6 are as shown in Table 6.4.7 and Table 6.4.8, respectively. Overall, average monthly participation rates at both areas were gradually increased.

Table 6.4.7 Amount of Recyclables Collected in Krokop 10

(Unit: kg)

Type of recyclables	31 Jul	28 Aug	11 Sep	25 Sep	09 Oct	30 Oct	27 Nov	Total
Newspaper	3,208	315	159	1,394	347	1653	800	7876
Others paper	340	0	9	208	47	213	600	1418
Glass bottles	10	0	8	10	4	20	8	60
PET mineral water bottles	10	1	4	6	8	9	9	47
Aluminium cans	5	2	0	0.3	0	3	0	10
Clothing/ Textile	50	0	7	0	5	5	10	77
Battery	0	0	0	0	3 pieces	0	0	0
Total (kg)	3,623	318	187	1618	411	1903	1,427	9,487
Participation Rate (%)	28.5	2.9	19.8		25.4		13.1	(Ave.) 17.9

Table 6.4.8 Amount of Recyclables Collected in Krokop 6

(Unit: kg)

Type of recyclables	08 Oct	15 Oct	22 Oct	29 Oct	12 Nov	19 Nov	26 Nov	Total
Newspaper	9	37	0.2	67	9	0	14	136
Others paper	19	38	22	120	45	4	31	278
Glass bottles	3	4	11	11	3	0	2	34
PET mineral water bottles	0	0.3	3	2	3	0	0	8
Others plastic containers	1	0.2	2	3	1	2	1	10
Aluminium cans	0	0	0.1	0.2	0.6	0	0	1
Clothing/ Textile	0	0	0	0	0	0	0	0
Metals	3	0.4	3	0	2	4	0	12
Battery	0	0	0	0	0	0	0	0
Total (kg)	35	79	41	203	64	10	48	479
Participation Rate (%)	14.5				7.6			(Ave.) 11.1

(b) Collection Centres

For collection centre, Krokop 5 and Bulatan Park collection centre operated during every Sunday morning from 11am to 12pm. The total amount of recyclables collected at the Krokop 5 Collection Centre during pilot project period was 3,164 kg. Newspaper accounts for a 65 % of those recyclables collected.

(c) Buy back Campaign

Under PP-II-2 in Miri, an incentive campaign was conducted to encourage more people to separate and bring their recyclables, and achieved successful outcome.

On 26 November 2005, 3Rs Campaign with car parking coupons as an incentive was organised at Market Krokop 10. Car parking coupons were distributed based on the

equivalent “buy-back” price set by recycling collectors. The response to this campaign was overwhelming, attracting 387 participants that exchange recyclables with 1000 books of car parking coupon. Around 30 metric tonnes of recyclable items were collected in that day which is around 10% of average total recyclables (including commercial and industrial) collected in Miri with one day of campaign. MBM officers decided to continue this campaign, and 3 campaigns have already been successfully implemented.

(4) Source Separation Practice in MPSJ

De Palma Condominium was selected as target residential area in MPSJ.

1) Implementation Procedure in MPSJ

Activities implemented under PP-II-2 in MPSJ are summarised in Figure 6.4.5.

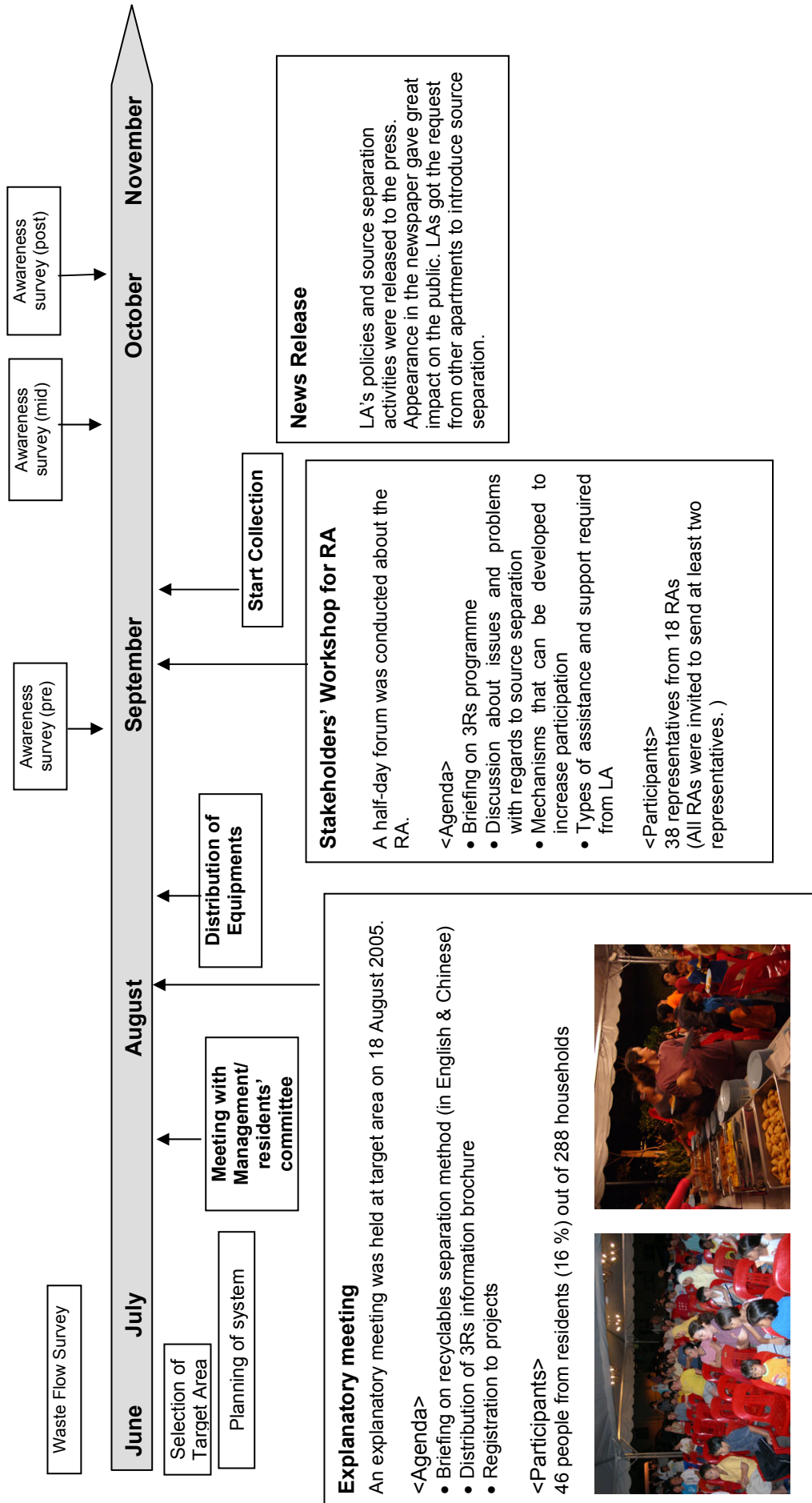


Figure 6.4.5 Implementation Procedure for PP-II-2 in MPSJ

2) Source Separation System introduced in MPSJ

Source separation system set up and tested in MPSJ is as shown in Table below.

Table 6.4.9 Source Separation System in MPSJ

Item	Contents
Method tested	Station collection
Target Items	Paper, Plastics, Metals
Duration	8 weeks
Collection Frequency	• Everyday at 10 am for organic waste by Alam Flora • Once a week for recyclable items by an appointed recycling agent.
Equipments for source separation	• Large Recycling Bins (4 bins are placed within condominium premises) for recyclables (newly introduced) • 3 coloured plastic bags with name tags were distributed for separation • Store room (1 /block) for non recyclables
Segregation method	4 Separation: Organic waste, Used papers (News papers, black & white papers, magazines), Plastics (bottle, packaging, etc.), Metals(aluminium cans, ferrous cans, etc.) Residents separate recyclables from wastes and put those in plastic bags which are distributed under PP, then discharge the recyclables into recycling bins. Appointed recycling agent come to the Condo to collect recyclables. The private collector paid an agreed amount for the collected recyclables to the management.
Collector	Private recycling agent
Collection Fee	No additional fee for collection



Collection container and signboard placed at 4 collection points within De Palma Condo



Residents are requested to put recyclables in plastic bags and bring to the containers.



Signboard at the Apartment



Collection service by appointed recycling agent

Plate 6.4.5 Source Separation Practice in MPSJ

3) Collection of Recyclables

Implementation of the pilot project in D'Palma Codo was delayed, due to the transfer of the apartment management committee from the developer to the residents' committee, and the related internal circumstances. After the official change of management, the project was carried out under the leadership and coordination by the management committee and protem committee.

Due to the low response, a house-to-house canvassing was undertaken during the pilot period. This was done together with representatives from the management committee and protem committee whereby, each household was visited and a project briefing was delivered. This increased the participation rate by another 22 households. Furthermore, MPSJ issued press release on the project to the newspaper. This appearance in the newspaper encouraged the participating residents, and contributed to the increase in the participation rate.

Average amount of recyclables collected during the project period was 456 kg/time. Both of amounts of recyclables collected and participation ratio have increased over the duration of the pilot project (see Table 6.4.10). This indicates that more households were getting aware on source separation during project period.

Table 6.4.10 Amount of Recyclables Collected in De Palma Condominium

(Unit: kg)

Type of recyclables	24 Sep	1 Oct	8 Oct	15 Oct	25 Oct	5 Nov	11 Nov	1 Dec	Total
Paper	330	277	192	No Collection	244	No Collection (Hari Raya Puasa)	563	471	2,077
Plastics	31	23	55		62		125	125	421
Metal & Glass	14	20	30		27		69	76	236
Total (kg)	375	320	277		333		757	672	2,734
Payment Received (RM)	61.25	49.45	48.00		59.15		133.20	117.75	468.80
Participation Rate (%)	14		24		28		38	34	(Ave.) 28

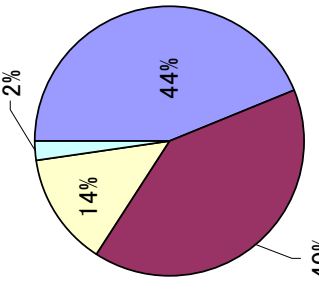
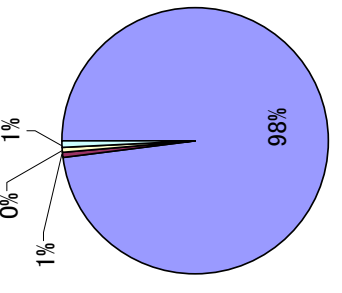
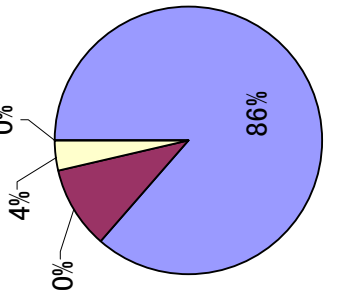
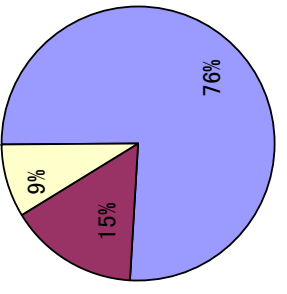
After the Pilot Project period, there have been additional requests from other apartment buildings. Two apartments (i.e., D'Tiara and Sri Penaga) who are under the same management as D'Palma have requested for similar programmes in their apartments. Another apartment block in Puchong (La Lite) has also requested a briefing on the mechanism and experience of this source separation project as they are also planning a recycling programme in their neighbourhood.

(5) Summary of Results of Source Separation for Households

Table 6.4.11 shows the participation ratio of source separation activities in each target group, composition of recyclables collected and average amount of recyclables collected. Participation ratios in average are rather high (24% in MPPP, 60% in Krokop 10 in MBM, 28% in MPSJ) except for Krokop 6 in MBM (5%). More than 75% of recyclables were papers (98% in Krokop 10 in MBM, 86% in Krokop 6 in MBM, 76% in MPSJ) except in MPPP (44%).

Duration of source separation practice of PP-II-2 was only 3 to 4 months. It is recommended that this activity should be continued with periodical monitoring, and long term records (i.e. one year or more) should be analysed.

Table 6.4.11 Summary of Results of Source Separation for Households

	MPPP	MBM		MPSJ
Type of house	Terrace house	Terrace house		Apartment
No. of HHs.	409 HHs incl. 12 shop houses	184 HHs (Krokop 10)	104 HHs (Krokop6)	288 units
Collection methods	Door-to-door	Door to door & Station Collection		Station Collection
Equipments	1 HDPE bin	1 plastic bag & boxes for papers		3 plastic bags & containers
Separation method	*2 separation	*3 separation		*4 separation
Collector	Private recycler	NGO	Collection Contractor	Private recycler
Frequency	1/ week (Sunday)	1/ 2 weeks (Sunday)	1/ week (Saturday)	1/ week (Sunday)
Incentive	Non	Donation (Directly)	Donation(via contractor to NGO)	Proceeds are back to committee
Participation Ratio	24 % (average)	60 % (average)	5 % (average)	28 % (average)
Waste Composition				
Amount of Recyclables Collected	Average 487 kg/time	Average 1355kg/time	Average 68 kg/time	Average 456 kg/time

(6) Public Awareness Survey

Questionnaire surveys were conducted to capture the changes in 3Rs awareness of household through the Pilot Project (PP), and to evaluate this PP. Survey was carried out three times, i.e., before, during, and after the Pilot Project.

It was found that the majority of respondents already had some knowledge on 3Rs, and was practising it. However, comparing the results before, during and after the pilot project, there have been significant improvements in both knowledge and practices on 3Rs.

Table 6.4.12 shows the number of samples for awareness survey conducted in each LA.

Table 6.4.12 Number of Samples for Awareness Survey

Item	MPPP	MPSJ	MBM
No. of Sample	100 hhs	288 hhs	105 hh
Pre Source Separation	100 HHs responded	93 HHs responded (32.3 % response rate)	80 responded
Mid Source Separation	100 HHs responded	112 HHs responded (38.9 % response rate)	Not be implemented
Post Source Separation	100 HHs responses	105 HHs responded (36.4 % response rate)	76 responded

Figure 6.4.6 shows the change in knowledge on 3Rs among residents in the target area. From the graph, significant improvement in knowledge on 3Rs between pre, mid and after PP is observed. As for question No.1, “Do you know what items can be recycled”, after the Pilot Projects, there were no respondents who answered “No idea”, whilst 1% (average of 3 LAs) had answered “no idea” before the PP. This increase in awareness can be considered to be the outcome of the 3Rs promotional activities such as distribution of pamphlets, 3Rs brochure, and workshop undertaken during pilot projects.

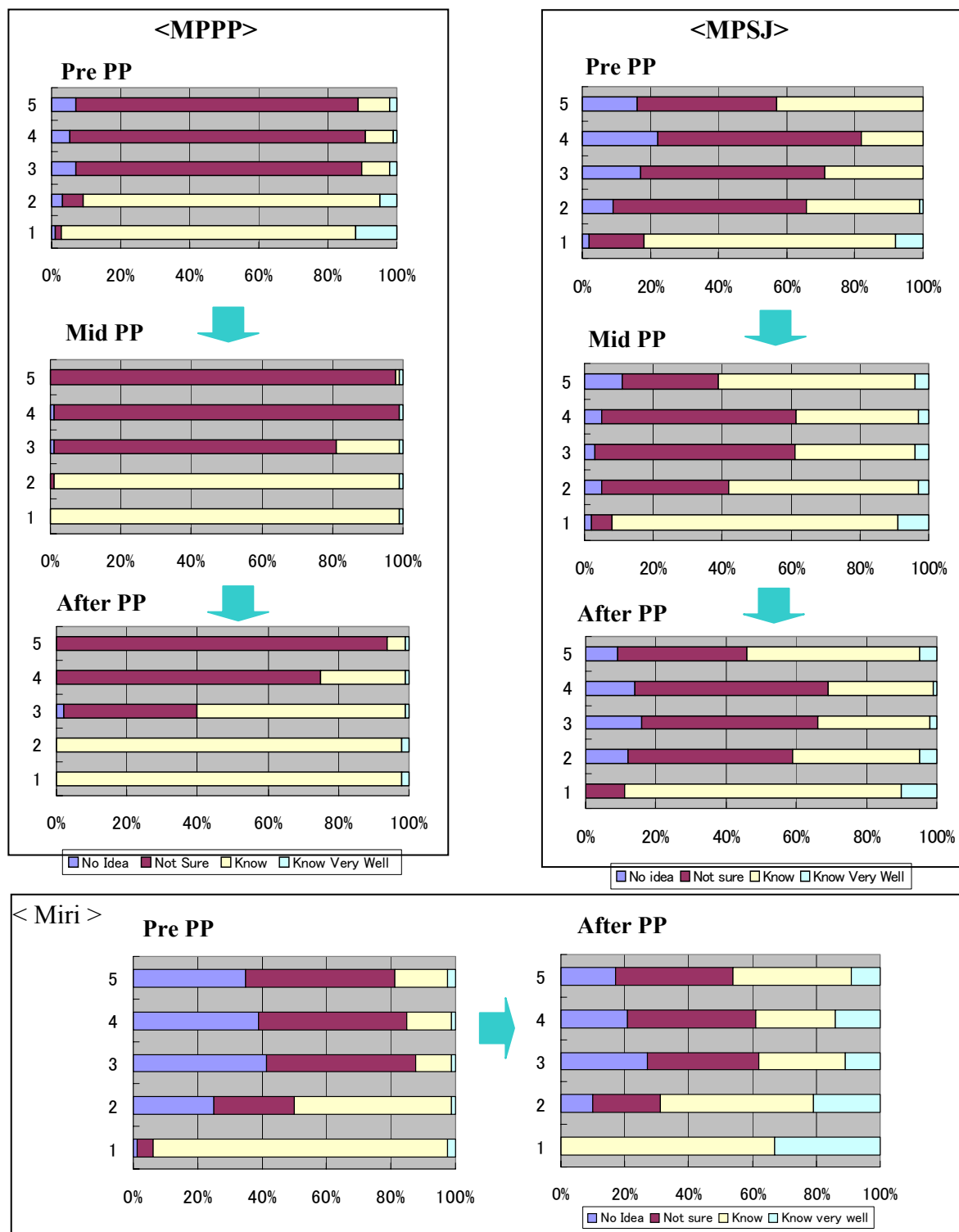
However, there still remain a considerable number of people who are “not sure” about ideas for reduction, recycling and reuse of wastes. It is suggested that awareness campaigns be carried out continuously after PP.

In addition to the improvement in knowledge, there can be seen improvement in practice of 3Rs activities in the daily life (see Figure 6.4.7). In MBM, number of people who answered “Yes” to the practice of REDUCE activities (question 1, 2, 3, 4) showed a significant increase. It can be considered that through the source separation practice which requires them to think how to separate every time they dispose, people started to take into consideration of disposal before they buy things. Especially as for “buy wisely” question, 87% of the respondents in MBM answered “yes” after PP, while only 37 % of them had been practicing “buy wisely” before the PP. From these results, it can be concluded that introduction of source separation contributed to improve consumption habit.

Notwithstanding these encouraging results, some negative impact was observed in the survey results. In the 2 model LAs (MPPP and MPSJ), number of respondents who refuse plastic bags at shops dropped by 14% and 4 % respectively. According to the

comments, main reasons for not refusing bags are that they are not sure what alternatives are available, and they want to use those plastic bags to put wastes/recyclables during waste separation. In MPPP, where plastic bags were not distributed for this project, the largest decrease ratio was seen. To encourage “refuse plastic bags” activities, it may be needed to give information for alternative equipments for source separation.

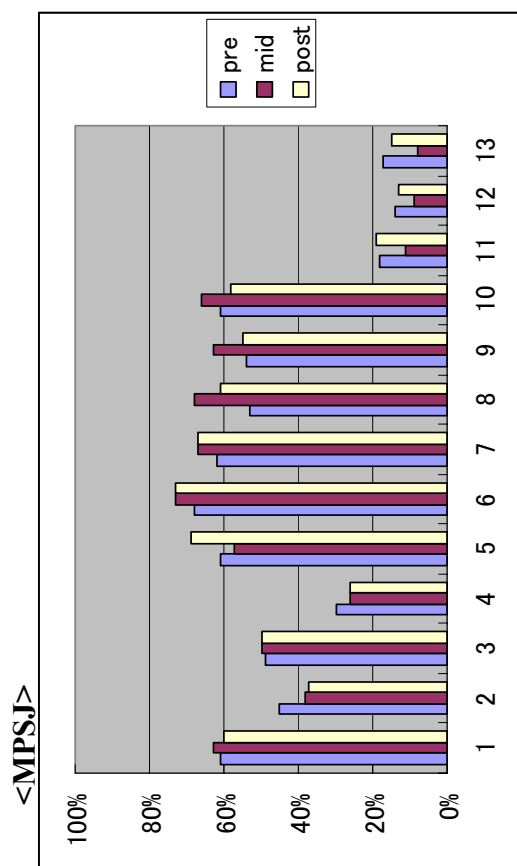
There are interesting results in MPPP, the number of respondents to “sending / selling recyclable items to recycling centres” dropped after implementation of the Pilot Project. This result could be owing to the convenience of the separation of waste at source programme and door to door collection on every Sunday by the appointed recycling agent.



<Questions>

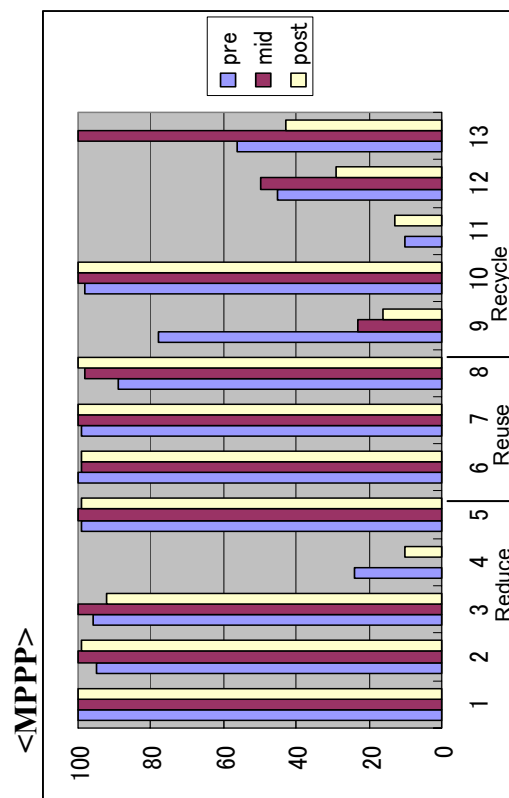
1. What items can be recycled,
2. Who collect recyclables
3. Where are recyclables sent
4. How the recyclables are treated
5. Ideas for reducing/ reusing/ recycling wastes

**Figure 6.4.6 Change in knowledge on 3Rs matters
(pre, mid and post survey in the 3 LAs)**



<Questions>

1. Buy wisely, 2. Avoid buying/using disposable goods
3. Refuse excessive packaging at shop
4. Refuse plastic bags at shop
5. Use washable, refillable beverage container when you go out
6. Wash and reuse bottles, cans & bins
7. Reuse half-used paper
8. Practice waste separation at home/office for recycling
9. Send/sell recyclable items to recycling centres
10. Sell/give recyclable items to collectors
11. Buy from second hand/recycling shops
12. Volunteer at recycling organisation
13. Compost yard and garden wastes etc



<MBM>

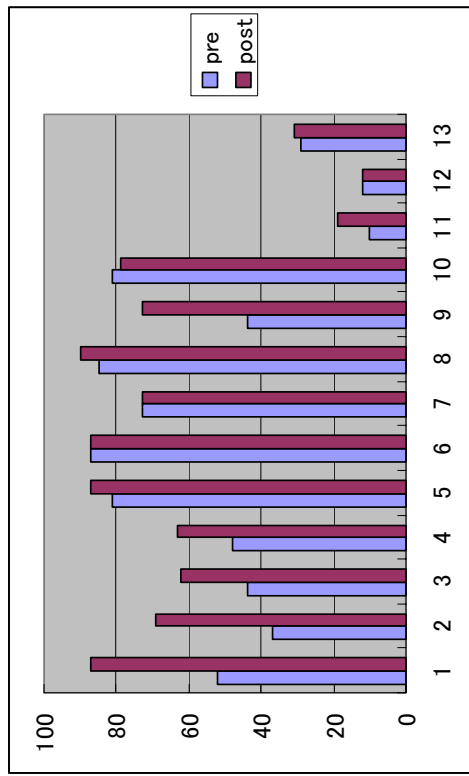


Figure 6.4.7 Change in Current Practice of 3Rs Activities

There also can be seen remarkable improvement in practice of source separation. Figure 6.4.8 shows the comparison between the results of survey on current practice of source separation before, during, and after the Pilot Project in MP Subang Jaya. Eighty-nine (89%) of respondents were separating old newspaper since before the Pilot Project, which increased to 100% of respondents after the Pilot Projects. As for cardboard, plastic bottles, glass, and metal/aluminium cans, the percentage increased up to 90%. This also can be considered to be the outcome of the series of awareness campaign.

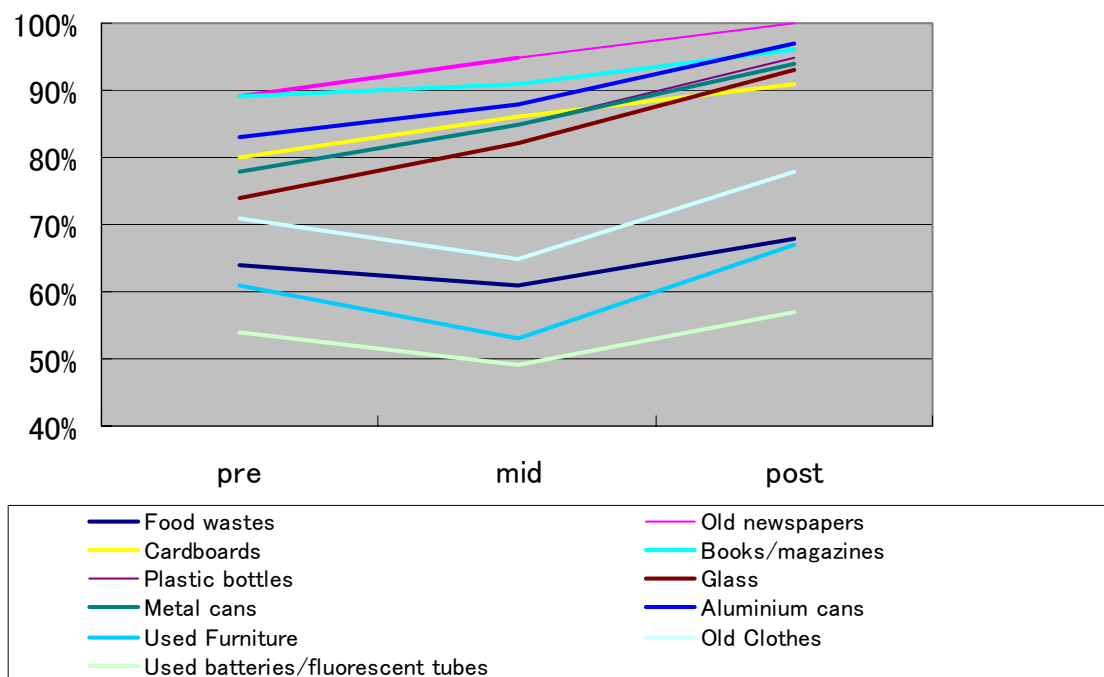


Figure 6.4.8 Percentage of Households Undertaking Source Separation (Pre, Mid and Post Surveys in MPSJ)

(7) Preparation of Guidelines for Source Separation

Based on the experience of PP-II-2, “Guidelines for Source Separation of MSW” has been formulated. Flow chart introduced in the Guidelines is as shown in Figure 6.4.9.

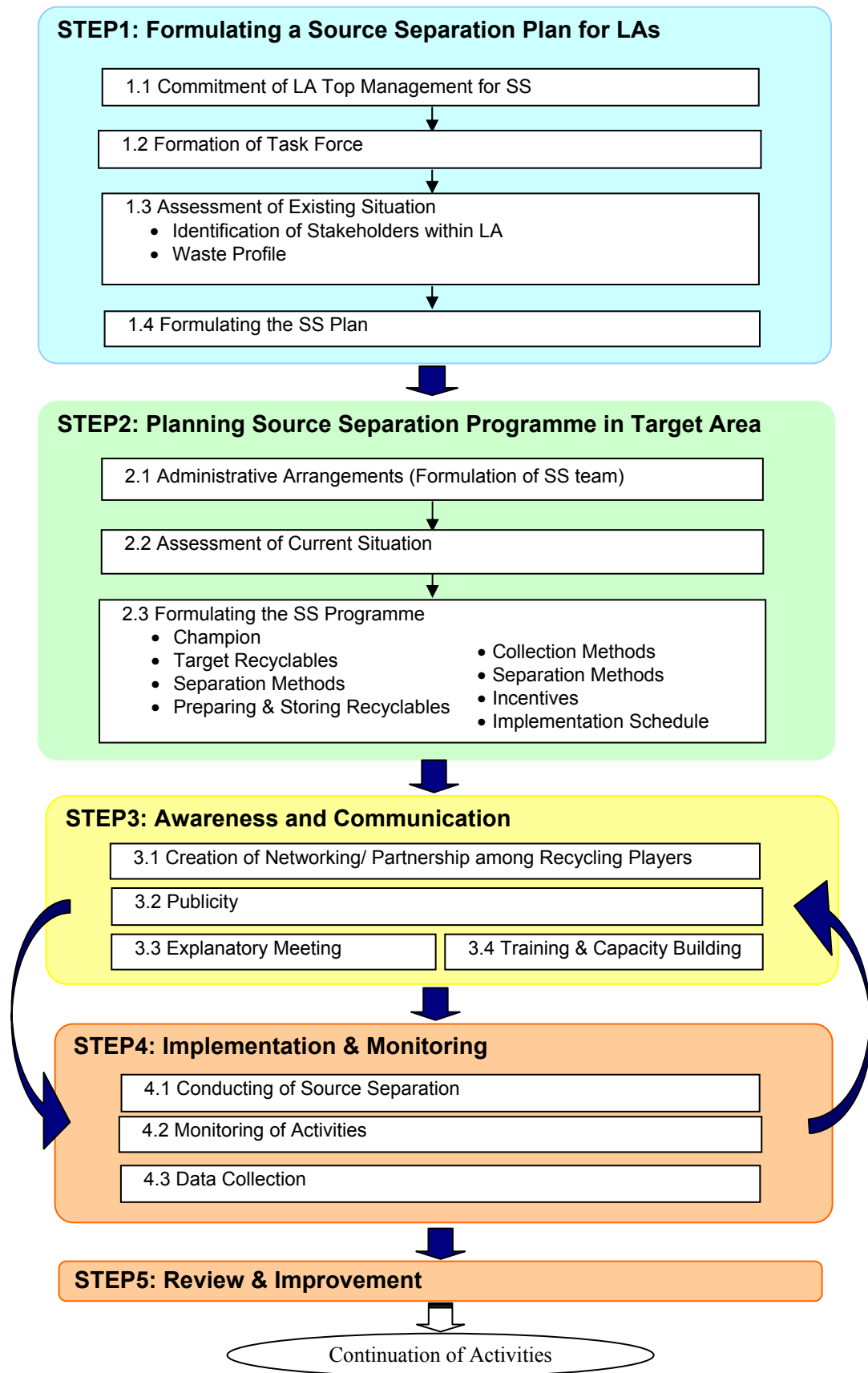


Figure 6.4.9 Flow Chart for the “Guidelines for Source Separation of MSW”

6.4.3 Source Separation for Institutions (MPSJ Complex, MPSJ)

(1) Description of MPSJ Complex and Current Recycling Programme

MPSJ complex comprised of nine departments (comprising 36 sub-units) and 3 units. There are 1,200 employees working in the MPSJ complex.

Since 2004, the management of MPSJ has organised an on-going source separation programme at its headquarters as well as at its two branches. The collection centre is located in MPSJ complex and is based on a buy-back system. Individual staff brings recyclable materials from their work place or from home to the collection centre and get paid on the spot.

Table 6.4.13 Amount and Value of Recyclable Materials Collected by MPSJ Staff (January to June 2005)

No.	Category	Total (kg)	Value (RM)
1.	Paper	6,989	853.98
2.	Cartons	882	88.22
3.	Glass	314	15.70
4.	Plastics	295	29.45
5.	Aluminium & Metal Cans	139	41.85
Overall		8,619	1,029.20

(2) Source Separation Practice in MPSJ Complex

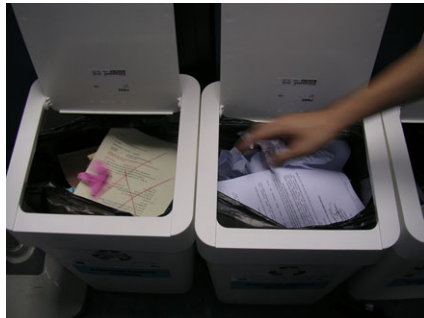
Source separation system introduced at MPSJ complex is as described in Table below.

Table 6.4.14 Source Separation System at MPSJ Complex

Item	Contents
Method tested	Station collection for papers
Target Items	Paper (reduction of papers)
Duration	8 weeks
Collection Frequency	Once a week for recyclable items by an appointed recycling agent.
Equipments for source separation	3 bins for recyclables (newly introduced to all departments) (1 for white paper, 1 for mixed paper, 1 for other recyclables) - Existing bins for non-recyclables
Segregation method	4 Separation : White paper, mixed paper and other recyclable materials, non-recyclables (organic wastes, etc) MPSJ staff disposes all recyclable materials into relevant bins. Recyclables are then sent to the current MPSJ buy-back centre and the money and points received are then credited to the department.
Collector	Private Collector
Collection Fee	No additional fee for collection
Incentives	3Rs Competition (see below)



A set of 3 collection bins were distributed to each department.



Staffs were requested to separate black & white paper from other papers.



Recyclables collected were weighed for competition

Plate 6.4.6 Source Separation Practice at MPSJ Complex

(3) Explanatory Meeting for Staffs

An explanatory meeting with the respective departmental heads of MPSJ for the paper-recycling project was conducted on 8th September 2005 at MPSJ Seminar Room.

During the meeting, the paper-recycling project within the MPSJ complex was briefed followed by the discussions on topics below. At the end of the explanatory meeting all departmental heads agreed that they would assign one officer per unit to manage and monitor the paper-recycling project for their respective units. The attendants also provided suggestions and recommendations for the project as follows.

<Topics>

- Identification of location for bins.
- Specific suggestions to reduce paper use within departments
- Criteria that will be taken into account for rewarding departments paper recycling project
- Current practice whereby staff, on their own initiative, sell to collectors
- Most of the staff practices recycling just to gain something (money value in every action).

<Suggestions and Recommendations from Participants>

- All confidential documents need to be shredded (using the shredding machine) before being thrown into the bins.
- Create a quota system and limit the paper supply in every department.

- Create awareness among staff. This could be done through support from the project initiator in the form of pamphlets, posters, banners, etc.
- All Heads of Departments should play their roles to ensure the success of this programme. There must be specific guidelines for them to follow.
- Need to change the attitude and mind of all and to be more disciplined. Organising of competition is necessary if all have that attitude.

(4) Public Awareness Activities

Public awareness activities that have been undertaken during the pilot project period are as follows:

- Meetings and discussions as well as distribution of source separation pamphlets to institutions (MPSJ complex)
- Newspaper articles (New Straits Times and The Star (English) and Oriental Daily (Mandarin)) on the pilot project objectives and activities.

(5) Results of Source Separation Activities

The amount of recyclable materials collected by MPSJ staff for their earlier competition between January to June 2005 was 8,618 kg. Of this, 82% (6,989 kg) was paper. Table 6.4.15 shows the total collection of recyclable materials within the MPSJ complex by MPSJ staff.

Comparing the amount of paper bought and paper collected, amount of recycled paper was higher than the amount of paper bought in some departments. This could be due to the fact that staff brought recyclable paper from home, or recyclable paper had been stocked for several months and then brought in for recycling.

Table 6.4.15 Amount of Recyclable Collected in MPSJ Complex

Week	Date	White paper (kg)	Mixed paper (kg)	Other recyclables (kg)
1	29 Sept 05	56.2	72.0	9.8
2	6 Oct 05	35.5	37.2	4.5
3	13 Oct 05	48.7	34.9	4.4
4	20 Oct 05	1.0	8.0	0
5	27 Oct 05	28.8	33.7	4.0
6	3 Nov 05	Hari Raya Puasa		
7	10 Nov 05	4.0	11.0	2.0
8	17 Nov 05	-	769.0	-
Total (kg)		210.3	960.8	24.7

<3Rs Competition>

Reduction ratio, Reuse ratio and Recycling ratio were calculated based on the results of activities in each department, and evaluated to decide the Department that reduced the most, Department that reused the most and Department that recycled the most. Improvement ratio was also examined for additional award. Winners for each award were decided as shown in Table 6.4.16.

Table 6.4.16 Results of 3Rs Competition

Award	Name of Department
Reduce	Dept of Health and Town Service
Reuse	Dept of Landscape
Recycle	-
Recycling improvement rate	Dept of Assessment & Property Management

6.4.4 Source Separation at Mega-Mart (South City Plaza, MPSJ)

(1) Description of South City Plaza and Current Recycling Programme

Opened since November 2003, South City Plaza (SCP) in Seri Kembangan is a shopping complex located in the southern corridor of the Klang Valley, in the urban area of Seri Kembangan and Serdang, about 20 Km south of Kuala Lumpur.

This shopping complex contains 143 shops and restaurants with Giant and Parkson being the two main anchor tenants. SCP has 4 floors, the first two being filled with shops, restaurants and offices. The third floor is used for amusement and recreation activities. The management office of SCP is located on the fourth floor.

There was no source separation actively undertaken by the tenants except for Giant Super Store and Parkson. These two outlets have their own disposal and collection centres. The other tenants throw rubbish (both recyclable waste and organic waste) in the common garbage bins located throughout the building.

The housekeeping staff currently collects these garbage and brings them to the central garbage collection point. The staff normally scavenges for recyclable materials before dumping the garbage at the collection point. The recyclable items collected are stored in their store room and sold to collectors separately. The SCP management does not interfere in this matter since these are done after the housekeeping staffs have completed their duties.

Figure 6.4.10 shows the current status of wastes generation in the South City Plaza.

Table 6.4.17 South City Plaza – Profile

Type of Store	Floor-space / sq.ft	Number of Shops
Anchor Tenants	137,698	3
Bakery, Food-court and Restaurants/Cafes	32,936	13
Computer, Electrical Appliance, Telecommunication	35,330	12
Entertainment, Leisure	29,858	4
Fashion, Fashion Accessories, Lingerie Shop	58,534	39
Beauty Salons, Massage	6,312	7
Footwear, Luggage & Bag Accessories	8,822	12
College, School, Banking Service and Other Offices	15,178	9
Car showroom & Accessories	3,761	1
Music, Movie, Game, Bookstore, Musical instruments	35,543	10
Health Products, Personal Care, Optical	8,578	13
Gift, Toys, Hobbies, Souvenir	4,036	4
Goldsmiths & Jewellery, Clock & Watches	6,256	10
Home Improvement	33,723	6
Total	416,565	143

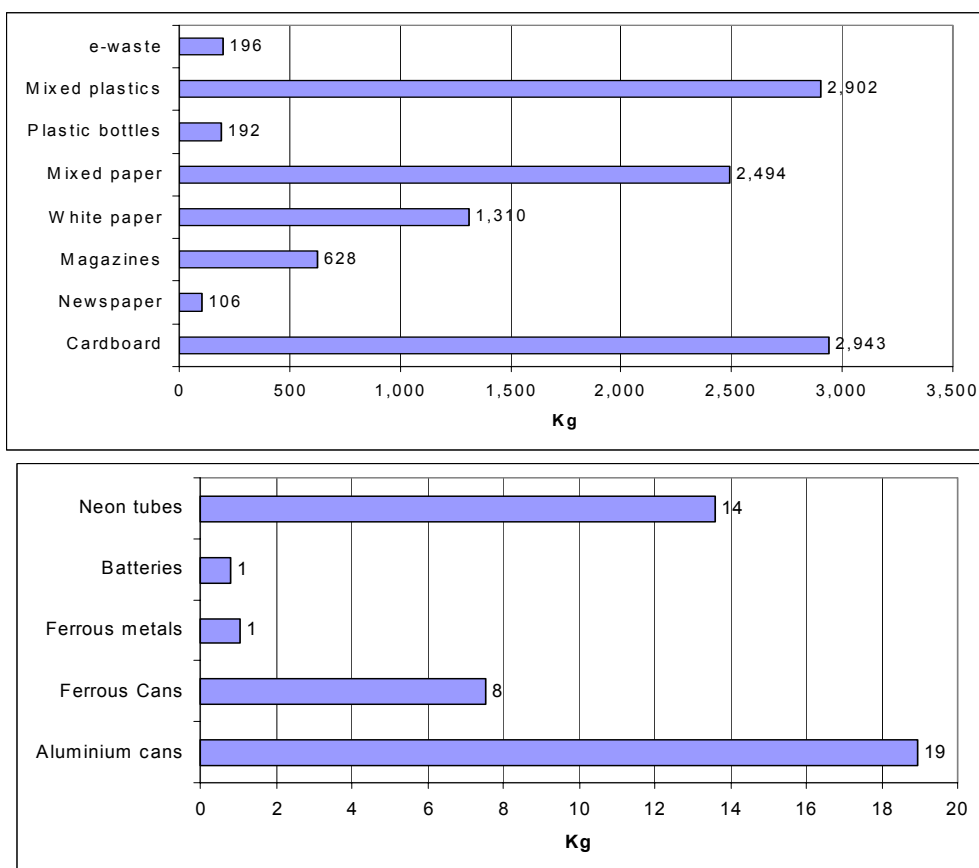


Figure 6.4.10 Amount of Waste Generated Monthly

(2) Source Separation Practice in South City Plaza

The source separation project that was finally identified for South City Plaza was a buy-back cabin. The study team together with MPSJ decided to appoint Alam Flora to manage the buy-back centre.

After numerous meetings and discussions between the Study team, MPSJ and Alam Flora, it was agreed that the buy-back centre at South City Plaza is operated with organisation structure as illustrated in Figure 6.4.11. Since this projects the co-operation from two private companies that take business as the first priority, it took three months to reach conclusion, which satisfies the requirements of all the players'. This time consuming discussions indicated that the commitment of top management is crucial to introduce a successful recycling programme.

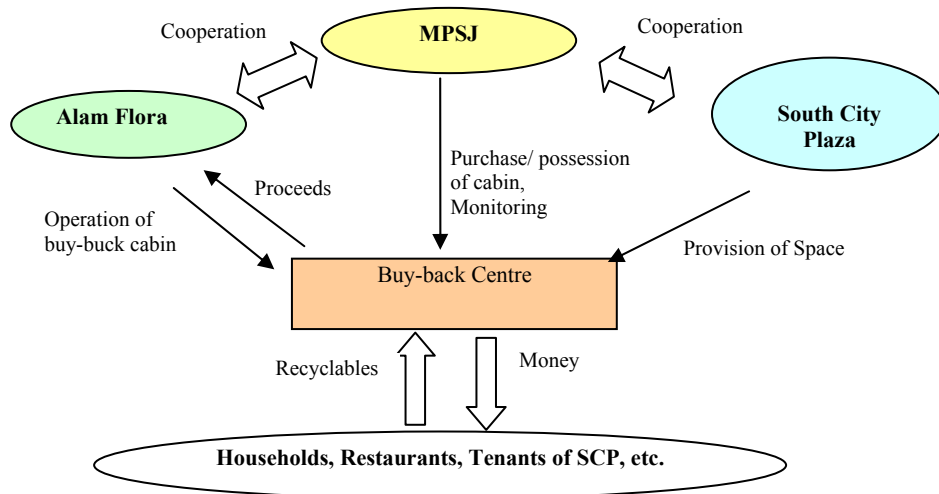


Figure 6.4.11 Basic Operation Structure for South City Plaza Buy-back Centre



Plate 6.4.7 Buy Back Centre in South City Plaza

(3) 3Rs Awareness Campaign

A soft launch of the cabin was undertaken on 7th November. Posters and pamphlets were put up and distributed during the soft launch of the buy-back cabin. An official launch plus an awareness campaign was undertaken on 25 November 2005 whereby 3Rs brochures and shopping bags were distributed to public and attendants to the launch. In the first week of operation, prior to the official launch, the response to the buy-back cabin was very low.

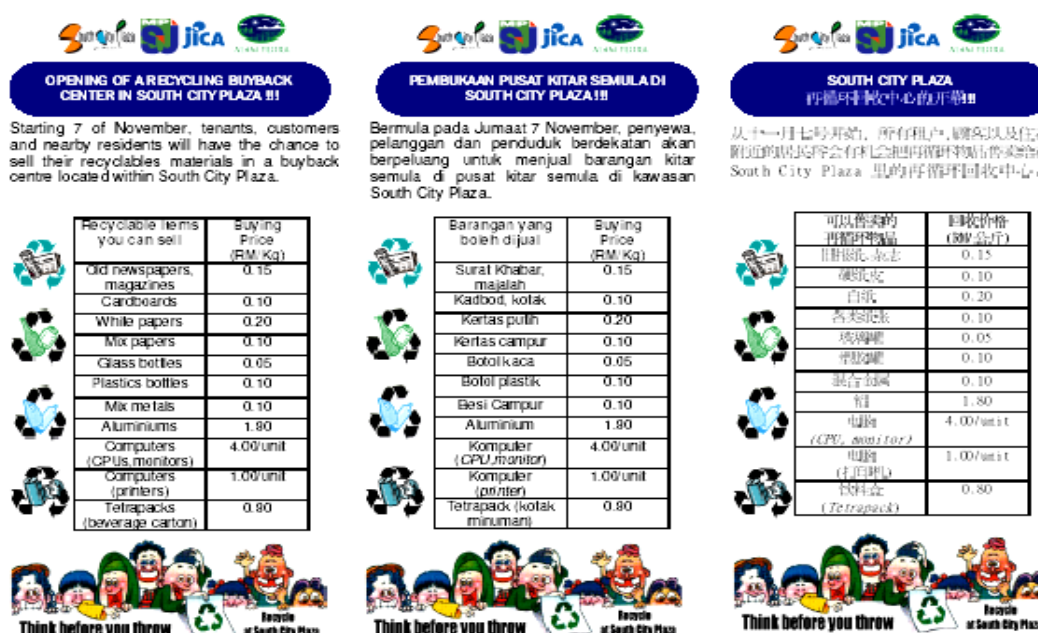


Plate 6.4.8 Leaflet (below) for Buy-back Centre at South City Plaza

6.4.5 Source Separation at Hotels (Dynasty Hotel in MBM)

(1) Description of Dynasty Hotel and Current Recycling Programme

Dynasty hotel has a total of 132 rooms and a yearly average occupancy rate of around 80%. Dynasty hotel has around 160 staffs where 30 of them are from the housekeeping section. Dynasty Hotel indicated their enthusiasm to get involved in this project at the beginning.

The recycling activities in the hotel are very informal and mainly related to newspaper, corrugated cardboard and aluminum cans. The recycling was implemented informally by the housekeepers of the hotel. There were no recycling programmes in the hotel office or targeted towards the hotel guests.



Plate 6.4.9 Dynasty Hotel in Miri

(2) Source Separation Practice in Dynasty Hotel

1) Source Separation System introduced in Dynasty Hotel

For Dynasty Hotel, the collection system in guest room and series of reduce and reuse activities were proposed in the initial stage. However, due to many concerns and considerations of the impact on the normal business activities, such as the risk of guest putting on fire, the time constraints for cleaners to empty the source separation bins,

etc., it was decided that introduction of source separation system into limited area, i.e., guest rooms on 2 floors, administration office and outside the hotel. Collection system implemented is as summarised in Table 6.4.18. Figure 6.4.12 shows collection route during the Pilot Project.

Table 6.4.18 Source Separation System at Dynasty Hotel

Item	Contents
Target Area	Guest rooms on selected floors (3 rd and 4 th floor), Administration office and function rooms Restaurants, collection centre established behind the hotel
Target Items	Papers, Plastic, Metals, PET bottles
Equipments	Transit collection bins with plastic bags at staff lift area on 3 rd and 4 th floor Collection containers at collection centre Recycling collection boxes and plastic bags at the administration office
Segregation Method	Hotel guests were requested to separate recyclables from other wastes, and to bring those to the transit collection bins set up near the emergency exit on 3 rd and 4 th floor. The recyclables were weighed and recorded by the housekeepers before the transfer to the recycling station.
Collector	Recycling agents i.e. Syabas Synergy and 3Rs Enterprise



Collection Containers Situated at Backyard of the Hotel



Information leaflet inside the guest room



Recycling Bins at lift area on 3rd and 4th Floor

Plate 6.4.10 Source Separation Activities in Dynasty Hotel

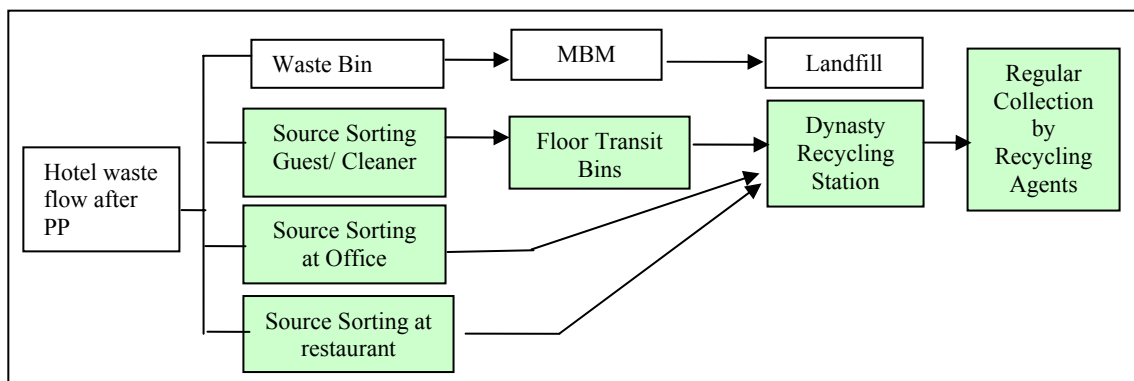


Figure 6.4.12 Waste Flow During the Pilot Project

2) Explanatory Meeting for Dynasty Hotel Staff

An explanatory meeting for Dynasty Hotel staff was carried out on 24 August 2005. The participants included most of the section representatives of the hotel as well as representative of the housekeeping section that is very important for 3Rs initiatives. During the meeting, 3Rs awareness talks was given by Miri City Council (MBM) and Natural Resources and Environmental Board (NREB), followed by briefing on the source separation in Dynasty. Information brochure on 3Rs for hotel, recycling boxes and bags were distributed at the meeting.

3) 3Rs Awareness Campaign

Information leaflets prepared for the hotel guests were placed inside the guest rooms as well as distributed to the guest when they checked in. Banner designed was set up in front of Dynasty Hotel to let the public know about this project.

4) Results of Source Separation

Amount of recyclables collected during the pilot project periods at Dynasty Hotel is as shown in Table 6.4.19.

Table 6.4.19 Total Recyclables collected at Dynasty Hotel on November 2005

Type of recyclables	15.11.05	28.11.05
Newspaper	127	8
Others paper	20	0
Old Corrugated Cardboard	0	30
PET mineral water bottles	6	28
Others plastic containers	2.5	0
Total	155.5	66

Due to the time consuming preparations, the collection system started only in late October 2005. It was too early to conclude any trend in relations to the performance and amount of recyclables collected at Dynasty Hotel at the time of reporting.

There were however some issues of concerns:

- For the recycling bins at the staff lift area, the feedbacks from hotel guests were not encouraging mainly due to the location and visibility of the recycling bins. The location of bins was not convenient for guests and there were no signs allowed by management on the door leading to the recycling station area;
- There were some mixed waste and un-cleaned recyclables sent to the recycling stations behind the hotel. Clear signboards and instruction on source separation were set up. Further training of hotel staff on source separation need to be carried out.

It was observed that the amount of recyclables collected at the stations include those sent by some public. This also indicates that the effort is not only restricted to influencing the hotel but also public who frequent visits the hotel compound. Most of the recyclables collected were paper products.



PCM Roundtable



OJT for MPPP Officers



Briefing on Source Separation for Residents



Launching Ceremony



3Rs Workshop (03 September 2005)



Distribution of Bins



3Rs Campaign (3Rs Camp for Students)

Plate 6.4.11 PP-II Activities in MPPP



PCM Roundtable



OJT for Officers in MBM



Questionnaire Survey



Launching Ceremony



Explanation Meeting at Dynasty Hotel



Source Sorting Activities at Krokop



3Rs Campaign with Incentives



Plate 6.4.12 PP-II Activities in MBM



PCM Roundtable



Stakeholders' Workshop



**Explanatory Meeting on Source Separation
At De Palma Condominium**



Registration to the Project



Explanatory Meeting at MPSJ Complex



Launching Ceremony at South City Plaza



3Rs Campaign at South City Plaza



Plate 6.4.13 PP-II Activities in MPSJ

6.5 Evaluation of PP-II

6.5.1 Achievement Level

Based on the objectively verifiable indicators (OVIs) of the PDMs, the achievement level of Project Purpose and Outputs of PP-I were evaluated as shown in Table below. Overall, it can be considered that most of the outputs achieved were within expectation, and project purpose was partially achieved

Table 6.5.1 PP-II-1: Establishment of Local Recycling Network

Project Purposes/ Outputs	OVIs	Achievement Level
Project Purpose • Sustainable recycling is carried out under the leadership of LAs. • Capacity of LAs to monitor recycling activity is improved.	1. Frequency of reporting 3Rs practices to MHLG 2. No. of players to be monitored	The Project Purpose was partially achieved. The number of recycling players contacted by the LAs increased during the waste flow survey conducted as described in previous section. This information would facilitate monitoring networking in future to collect data and information on stakeholders' activities. Therefore, it can be said that the capacity of LAs to monitor recycling activity is improved. Having increased the network of stakeholders, the onus now is on the LAs to register the stakeholders and continuously maintain and sustain contact with them. Certainly, this would require commitment from the LAs and its management team, and allocation of manpower and annual budget to undertake monitoring and coordination of stakeholders.
Output 1: Data management system on SWM & 3Rs at the local level is established.	Waste generation amount, 3Rs quantity data and 3Rs activity practices.	Data management system at the local level was established. In MPSJ, for instance, information on recycling was based solely on data collected from Alam Flora; certainly, the recycling data and scenario captured did not present the actual situation in MPSJ. However, MPSJ encountered and established networking with more stakeholders through the waste flow survey conducted for PP-II, and consequently, MPSJ is now able to obtain more accurate data on the state of recycling within its jurisdiction. This improvement was observed in other model LAs. Having established a more systematic data management system, the system must be updated periodically by a team of designated staff. This requires commitment from the LAs and its management team, and allocation of manpower and annual budget to undertake

		periodic monitoring and updating of the data management system.
Output 2: Waste Minimisation Unit (WMU) is established in LAs (tentative-base)	No. of WMU staffs.	The WMU was established in all model LAs during the PP, and at least 1 to 3 Council officers were assigned to the WMU during the PP period. Having established the WMU, the unit must be manned by designated staff. Again, this requires commitment from the LAs and its management team, and allocation of manpower and annual budget to run the WMU.
Output 3: Recycling is carried out by stakeholders participated in PP.	Type & amount of recyclables handled by each stakeholder participated in PP.	Types and amount of recyclables handled by each stakeholder in target areas increased after the PP. The LA must maintain the initiatives and momentum established by the PP and periodically monitor and encourage (through education programmes and incentives) participation of the stakeholders. This requires commitment from the management team of the LA, including allocation of manpower and annual budget to run the WMU and 3Rs programme.
Output 4: 3Rs related information is published.	No. of 3Rs related information brochures, directory booklets etc. published.	3Rs related information brochures and directory booklets were successfully published and distributed to the public. In addition to the brochures, website on 3Rs was also established by each LA to disseminate more information to the public.
Output 5: Capacity of LAs officials and regional 3Rs leaders are developed.	Number of LAs officials/ regional leader participated in on-the-job training. (see activities)	At least 3 officers in charge of the project in the model LAs participated in OJT, and some of them were involved in this project from the planning part. Those officers have gained in terms of knowledge and skills. Moreover, the officers are now more aware of the importance and significance of waste minimisation through the numerous workshops held in conjunction with the PP.

Table 6.5.2 PP-II-2: Source Separation of MSW

Project Purposes/ Outputs	OVI	Achievement Level																									
Project Purpose Collection amount of recyclable materials separated at source increases.	Collection amount of separated waste at source	The Project Purpose was only partially achieved. Though a source separation system was set up for the target households, the rate of participation was rather low and the volume of collection was variable and inconsistent for a variety of reasons. The source separation programme at the target mega-mart and hotel encountered several issues in coordination and consensus among the stakeholders, in particular the private business sector and private collector. This resulted in significant delay in implementation.																									
Output 1: Source separation is carried out by residents/ communities and business entities.	1. No. of stakeholders participating in PP 2. Frequency of source separation for each waste type.	The source separation system was established in cooperation with the stakeholders in the target area as follows; <table><tr><th>LAs</th><th>Target</th><th>Recycling agents</th><th>Collection Frequency</th></tr><tr><td>MPPP</td><td>409 households</td><td>Recycling agents</td><td>1/week</td></tr><tr><td rowspan="3">MPSJ</td><td>288 households in De Palma Condo</td><td>Private recycler</td><td>1/week</td></tr><tr><td>MPSJ complex</td><td>Appointed recyclers</td><td>1/week</td></tr><tr><td>South City Plaza,</td><td>Alam Flora,</td><td>Everyday</td></tr><tr><td rowspan="2">MBM</td><td>288 households</td><td>Buddhist Tzu Chi, Garbage contractor</td><td>1/ 2weeks 1/week</td></tr><tr><td>Dynasty hotel (166 staffs)</td><td></td><td>Everyday</td></tr></table>	LAs	Target	Recycling agents	Collection Frequency	MPPP	409 households	Recycling agents	1/week	MPSJ	288 households in De Palma Condo	Private recycler	1/week	MPSJ complex	Appointed recyclers	1/week	South City Plaza,	Alam Flora,	Everyday	MBM	288 households	Buddhist Tzu Chi, Garbage contractor	1/ 2weeks 1/week	Dynasty hotel (166 staffs)		Everyday
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Output 2: Recycling route of recyclables (paper, glass, can and PET) is established.	Amount of source separated, discharged, collected and sold.	A new recycling route was established at each target housing area in the model LAs. The collecting route was improved so that recyclables could be collected on a regular basis by appropriate agencies. Though the amount of recyclables collected increased during the PP, the increase was only marginal.																									

Project Purposes/ Outputs	OVI	Achievement Level																	
Output 3: Profit from selling recyclables return to communities/ institutions.	Amount of profit from selling recyclables and income of communities from it.	Selling route of collected recyclables was established. <table border="1"> <tr> <th></th><th>Target Area</th><th>Groups that can obtain profit</th></tr> <tr> <td>MPPP</td><td>Hillside area</td><td>Collector (No profit is return to the residents.)</td></tr> <tr> <td rowspan="3">MPSJ</td><td>De Palma Condominium</td><td>Condominium management committee</td></tr> <tr> <td>MPSJ</td><td>Each department participating</td></tr> <tr> <td>South City Plaza</td><td>Anyone who bring recyclables to the centre</td></tr> <tr> <td rowspan="2">MBM</td><td rowspan="2">Krokok area</td><td>Residents who brings to the buy-back station</td></tr> <tr> <td>NGOs, Buddhist Tzu Chi (Recyclables collected in door-to-door collection are donated to NGOs)</td></tr> </table>		Target Area	Groups that can obtain profit	MPPP	Hillside area	Collector (No profit is return to the residents.)	MPSJ	De Palma Condominium	Condominium management committee	MPSJ	Each department participating	South City Plaza	Anyone who bring recyclables to the centre	MBM	Krokok area	Residents who brings to the buy-back station	NGOs, Buddhist Tzu Chi (Recyclables collected in door-to-door collection are donated to NGOs)
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MBM	Krokok area	Residents who brings to the buy-back station																	
		NGOs, Buddhist Tzu Chi (Recyclables collected in door-to-door collection are donated to NGOs)																	
Output 4: Awareness of communities/ residents for waste Minimisation/ recycling is enhanced.	Number of residents participating in PR activities	Public awareness raising activities were carried out throughout the project period. Most of activities were implemented at strategic locations determined by the implementing committee in each LA or as a joint activity with other events. 3Rs information brochures were distributed to the participants at these activities. It is considered that those promotion activities contributed the enhancement of awareness among stakeholders.																	

6.5.2 Evaluation by OVIs

Table 6.5.3 Evaluation of PP-II

Criteria	Evaluation
Relevance	The Project Purpose and Overall Goal for PP-II-1 and PP-II-2 are relevant to the needs of the counterparts. It also is compatible to the policies and target of the Malaysian government to minimise and manage solid waste.
Effectiveness	Partial results were achieved as described in the previous section.
Efficiency	(1) Inputs for the project During this project, items listed in PDM were put in place to promote the activities. < Personnel > From JICA, Japanese and local experts were at hand to organise, coordinate, advise and guide the LAs. The local consultants were stationed in the LA office to work with LA officers in charge of the pilot project, ensure that the activities were implemented smoothly and effectively, and to serve as liaison between the local counterparts and the Japanese experts. <Equipment> Equipment (computer hardware and software) were provided to each LA based on the review of present situation and the demand of target groups. In addition to personnel and equipments, explanatory meetings, 3Rs campaign, dialogue sessions and house-to-house canvassing during the pilot project period were undertaken to enhance the participation as well as increase the awareness of residents in 3Rs activities.

	(2) Organisation management Generally, the local consultants stationed at the WMU established within the LA worked in close rapport with the officers in charge. Occasionally, problems arise, such as delayed implementation of the project, due to inadequate commitment of the top management and time constraint of the local LA officers who had to attend to other administrative matters, or who were not assigned fulltime to the WMU. Without full commitment and pro-active role from the top management, full efficiency in implementing these activities was not achieved.
Impact	Impact includes positive and negative, and expected and unexpected impacts on counterparts and target groups made by the pilot project. The data obtained during the pilot project indicates the positive impact on the relevant parties, such as increase in amount of recyclable collected were increased, awareness among public, and income from the selling of recyclable collected. This project also made negative impacts on certain stakeholders, however, judging from the feedbacks from the counterparts and target groups, it can be concluded, overall, that this project gave highly positive impact on stakeholders including counterparts. a. Positive Impacts: Positive impacts made by PP-II are as follows; - Awareness of public increased. - Amount of waste that goes directly to the landfill is in the decrease trend - Income from the collected source separated waste channelled back to the generators/ Organisation. - More structured system to track 3Rs results in LA (2) Negative Impacts: - Loss of income from the scavenging activities by the informal/individual collectors. - More frequent stealing of recyclables by non-appointed agents a. Loss of income from the scavenging activities by the informal/individual collectors. Before the pilot projects, some people such as housekeepers at apartment and hotel were getting proceeds from selling recyclables as their income. But official recycling system formulated at the target area during this project squeezed out those informal/individual recycling activities, and prevents informal recycling agents from earning money from scavenging activities. This loss of income for them can be considered to be negative impacts. b. Frequent stealing of recyclables by non-appointed agents As residents started separating recyclables from organic wastes, it became easier for itinerant recyclers to pick up those recyclables from the collection bins. This stealing give adverse effects on sustainability of source separation project as it discourages generators as well as appointed collectors. However, on the contrary, it can be said that the value of recyclable items has been higher by segregation at source. It is expected that source separation activities stimulate recycling business.
Sustainability	(1) Sustainability of WMU a. Organisational and Financial Sustainability MPSJ and MBM authorised WMU as a permanent function in their Council, and have already assigned the officers in charge. Therefore, it is hoped that

	this unit will be sustained in long-term after the pilot project. However, there will still be some financial issues. A lot of work will be required for WMU to continue source separation to further promote recycling activities, such as providing support in awareness campaigns and liaising between the residents committee and private recyclers so that any issues that may crop up can be settled amicably. It is uncertain that LA can allocate enough budgets for those activities. Some LA may need to have support from Federal Government to promote activities. MPPP have difficulty in manpower to maintain WMU or this data collection system. Considering the volume of work required, it is needed to find someone to assign this task in full-time. a. Technical Sustainability The officers trained under the PP have benefited much in terms of experience during the last 6 months, especially those who were involved in the design, planning, implementation, surveys and feedback sessions with the stakeholders have also gained in terms of knowledge and skills. They are capable of carrying out the project activities independently after the expiry of the pilot projects. Therefore, it will be no technical problem to maintain WMU and its data management system after the pilot project period. (2) Sustainability of Source Separation a. Organisational and Financial Sustainability In the source separation system formulated for the pilot project, all the three LAs does not need to pay additional fee for collection service by appointed recyclers. All those appointed agents are satisfied with the amount collected during the pilot project, and they have already expressed interest to continue collecting services in the project area after the pilot project. Therefore, it might not be financial / Organisational issues to continue on-going source separation system. However, continuous cooperation from recycling agents totally depends on the amount of recyclables separated at source. Thus, the sustainability of the project now relies on the commitment and management of the residents committee. The committee has to have continuous programmes and events to highlight to the communities residing there on the source separation activity. Income derived from the sale of recyclable waste can be utilised by the committee to achieve this. To sustain the impact of response after the pilot projects, other alternative mechanism, such as provision of equipments may need to be reconsidered. During the pilot project, target groups such as households were provided with bags/ boxed to separate their waste as a part of input from Japan side. LA must well consider and decide to what extent they can support the source separation in terms of finance. LA may need to have meeting with the residents committee/ representative of Organisation and work together to convince the people to continue their participation. In MPSJ, three new apartment/apartment blocks have already indicated interest in similar projects after learning about this pilot project through newspapers. The same management company as the D'Palma Condo's owned these apartments. MPSJ has to meet and discuss with them on similar mechanism to implement the project in these new areas. It is hoped that source separation activities in MPSJ will be expanded via the management company.
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6.5.3 Lessons Learnt and Recommendations

Issues encountered and recommendations of counter measures to be undertaken are summarised in Table 6.5.4 and Table 6.5.5.

Table 6.5.4 Issues Encountered and Recommended Counter Measures (PP-II-1)

Issues Encountered	Counter Measures/Recommendations
1) Data Collection	
Uncertain trans-boundary movement of recycling items affects the waste flow balance in LAs (MPSJ, MBM)	Trans-boundary movement data should be available from the surrounding areas in order to appreciate the real recycling scenario and to form a regional network between the city/towns. This requires further study, coordination from MHLG and full commitment and cooperation of the LAs and their management team.
During the questionnaire survey, some of the recycling agents were not cooperative because of the questionnaire used contained too detail information and some information were regarded as confidential to the stakeholders;	Questionnaires/data sheets should be simplified to the minimal required data if possible. It should be provided before the actual interviews are carried out.
Except for recyclers operating the recycling centres, there is no current list available for other collectors or factories accepting recyclable materials in LA.	- List of recyclers and collectors must be updated periodically with assistance from the Organisation of recyclers, resident associations and recycling buy-back centre operators. - A full-time team with an annual allocated budget must run the WMU that will be responsible for the updating. - Periodic on-the-ground investigation and fieldwork must be undertaken to identify recyclers and collectors.
Data received were not complete or in different formats or detail levels;	A full-time team with an annual allocated budget must run the WMU that will be responsible for the compilation and collation of the various data sets for the Networking System.
Difficult to get all to cooperate since there are no legal obligations for them to provide the required information	Registration for all recycling businesses and operators should be considered at the Federal and/or local level in order to obtain more accurate data on recycling activities.
- Counterparts assigned have other responsibilities and duties thus were not fully involved in pilot project activities. - Commitment and time from focal person limited.	- Regular meetings, discussion and dialogue sessions must be undertaken with counterpart staff so that they are aware of the progress of pilot project and its activities. - Counterparts must be delegated tasks relevant to pilot project activities with set deadlines. - Fulltime staff with an annual allocated budget must man the WMU.

Table 6.5.5 Issues Encountered and Recommended Counter Measures (PP-II-2)

Issues Encountered	Counter Measures
Source Separation at Target Housing Areas - Poor response from residents to participate in the project. - Pilferage of recycled material from bins placed for the source separation project by the regular garbage collection unit.	- Continuous discussions and dialogue sessions with target groups. - Door to door canvassing to explain about the project - Brochures and pamphlets distributed to all households. - Banners and posters set up throughout the target area. - Find out “Champions” from the target groups. - Convince top management to give strong commitment - Newspaper article on source separation project - Monitoring of bins during regular garbage collection trips - Education and surveillance of collectors
Source Separation at Institution Most departments do not effectively record or capture data on paper purchase, consumption, reused and recycled.(MPSJ complexes)	- Assigning/appointing at least one officer from each sub-unit to monitor the source separation project for their own department. - Data capture mechanism and ratio estimation for paper recycling project designed.
Source separation at Mega-mart - Differing ideas and views amongst external players on mechanism and facilities. - External players will cooperate only if they have benefits in return. - Red tape and bureaucracy procedures on all matters regarding agreements, contracts, permits and other matters related to implementation of source separation project - Volume of recyclable waste collected will not be sufficient to cover operating costs	- Continuous discussions and dialogue sessions with all external players. - Continuous negotiation on all aspects of source separation project implementation. - Follow-up and repeated visits and meetings with all players to start the implementation. - Campaigns and promotions to nearby residential and shopping areas to disseminate information regarding buy-back facility.

6.5.4 Recommendation for Future Action

(1) Recommendation for Waste Minimisation Unit (WMU)

The operation and management of the WMU established in the LAs under PP-II has been taken over by the respective LA at the end of the pilot project period. The WMU in the LA plays a central role in ensuring the sustainability of a 3Rs network. To guide the WMU in fulfilling its role and tasks, the recommendations outlined below are intended to strengthen and maintain the recycling network and data management system that have already been established for these LAs.

1) Data Collection, Monitoring and Updating

The WMU needs to continuously identify and monitor recycling stakeholders and update the recycling directory. This task must be adopted as a continuous process by WMU.

In tandem with the exercise to monitor and update the directory of recyclers, registration of all recycling businesses needs to be considered at the Federal or local level. This is crucial in order to obtain more accurate data on recycling activities and the state of recycling in the each LA area and the whole country.

The data information and management system must also be supported by a website that is to be maintained either by the LA officers or outsourced to a third party so that the information can be regularly updated and more importantly, accessible to the public.

Printing and dissemination of 3Rs educational and information materials is necessary to continuously inform and remind the public about their responsibility towards waste minimisation, how to go about doing it and the parties that can provide support and assistance.

2) Dissemination of Information and Formulation of Networking

Distribution of updated information to all relevant stakeholders must be carried out on a regular basis. It is recommended that the following be carried out to improve the communication and information dissemination.

- Regular press release and news;
- Regular updating and publication of information pipples e.g. general brochures, stakeholders directory; website contents;
- Development of on-line platform for 3Rs trading e.g. second hand shopping etc;
- Networking forum such as 3Rs networking workshop, technical meetings carried out at fixed interval.

3) Human Resources and Capacity Building

LA must consider allocating more resources in terms of budget and manpower to be more effective in waste Minimisation activities. The key staff handling the tasks of data handling and website updating must be sufficiently strengthened and trained. Alternatively, outsourcing some of these tasks should also be considered in view of the lack of manpower and the difficulty in creating new posts.

(2) Recommendation for Source Separation

Recommendations for strengthening and maintaining the source separation project for the three target areas are detailed below.

2) Household Source Separation

Prior to embarking on the programme, the LA/WMU needs to identify the “Champions” from amongst the residents to provide leadership, drive and commitment to the waste minimisation programme, and who would also serve as the chief liaison persons between the LA and the community. Preferably, these champions could be sourced from the residents’ association, community groups, religious organisations or NGOs, that is, groups or persons who are respected by the community.

Furthermore, a more proactive role from the residents and their community committees has to be encouraged. WMU officers can do this via continuous visits and discussions with the residents committee, management companies and the private recyclers, either on a quarterly or semi-annual basis, to identify arising issues or problems, monitor progress, or basically, give encouragement.

Awareness campaigns need to be conducted at least once or twice a year by the LA, highlighting the benefits of 3R. These campaigns such as a recycling carnival should be undertaken to target the whole family.

3) Institutional Source Separation

Strong support from the management of the LA is essential to set the objective and momentum for recycling and waste separation in the office. In addition, the provision of necessary mechanism and infrastructure is crucial to initiate and sustain the programme. Specific officers need to be designated within each department to be in charge of the project (currently there is already a list of designated officers in each department selected for the source separation project). However, this needs to be strengthened and improved in terms of responsibility and supervision. His/her main task would be to ensure assure that everyone is informed about the project, that the data of his/her department is circulated to the environmental officer in charge of the whole project. The task also includes acting as the liaison between the environmental officer and the staff of his/her department

A data collection system to collect all data (paper consumption, amount of paper reused, recycled, etc), monitor and evaluate the project must be implemented. To encourage participation, a competition could be organised on a monthly basis and the results posted on the bulletin board or office website.

Organising monthly meetings with the designated officers as well as other staff to keep them posted on the project implementation and progress is essential to monitor and check progress, response, feedback and/or any arising issues and problems.

4) Buy-back Source Separation

The success of any buy-back facility is dependent on promotion. Promotion activities should be carried out effectively via several media. These media may include:

- Conducting campaigns to surrounding areas to advertise the buy-back facility
- Distribution of leaflets including collecting schedule and services provided by buy-back centre
- Press release
- Door-to-door canvassing