

PART III

GUIDELINES FOR SOURCE SEPARATION OF MUNICIPAL SOLID WASTES



**Guidelines
for
Source Separation
of
Municipal Solid Wastes**



JULY 2006

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List of Abbreviations

| | |
|--------|--|
| CBO | Community-based Organisation |
| C-LAP | Committee on Local Action Plan |
| DOE | Department of Environment |
| JICA | Japan International Cooperation Agency |
| KPI | Key Performance Indicator |
| LA | Local Authority |
| LA 21 | Local Agenda 21 |
| LAP | Local Action Plan |
| LGD | Local Government Department |
| MHLG | Ministry of Housing & Local Government |
| MSW | Municipal Solid Waste |
| NGO | Non-governmental Organisation |
| ONP | Old Newspapers |
| RA | Residents Association |
| SS | Separation of Solid Waste at Source |
| SWM | Solid Waste Management |
| TF | Task Force |
| WM | Waste Minimisation |
| WM-M/P | Waste Minimisation Master Plan |
| WMU | Waste Minimisation Unit |

PREAMBLE

This set of “**Guidelines for Source Separation (SS) of Municipal Solid Waste (MSW)**” has been prepared as a guidance document for Local Authorities (LAs). The guidelines are intended to assist LAs to initiate, prepare and implement a Source Separation Plan for municipal solid wastes. The target user group is the staff of the Waste Minimisation Unit (WMU) or any group of personnel responsible for waste minimisation at an LA. The guidelines are applicable to all authorities (City, Municipal and District), regardless of location and size.

They may be applied in the case where a “*Local Action Plan on Waste Minimisation (LAP-WM)*” has already been prepared in the LA, and in the case where the LAP-WM is in the process of being prepared. In both cases, the guidelines will ensure that the LAs take into consideration all the vital components and factors in preparing the SS Plan.

The guidelines contain tips and provide examples of options that may be considered by LAs, depending on the conditions prevailing within the LAs. Such conditions include commitment, level of awareness, willingness and preparedness of solid waste generators, availability of organisations for handling recyclables, and the capacity of LAs. The guidelines draw upon the experience and lessons learnt from the Pilot Projects on SS carried out under the “Study on National Waste Minimisation in Malaysia” implemented with the cooperation of the Japan International Cooperation Agency (JICA): 2004-2006. The pilot projects were carried out at three model LAs i.e. Majlis Perbandaran Pulau Pinang, Majlis Perbandaran Subang Jaya, and Majlis Bandaraya Miri.

The guidelines are flexible and allow LAs to tailor their SS Plans according to the local conditions, needs and priorities. They allow for LAs to begin on a small scale, based on limited data and then to build up their database, networking, and review performance. Then based on performance and other relevant factors, the LA may decide to expand the SS programmes to new target areas/groups.

The guidelines are in line with the “*Waste Minimisation Master Plan*” and *Waste Minimisation Action Plan for Federal level*” prepared for the Federal Government under the same study mentioned above. The Master Plan aims at the creation of a *MATERIAL CYCLE SOCIETY*. They may be read in conjunction with the “**Guidelines for Formulation of Local Action Plan on Waste Minimisation (LAP-WM)**”, 2006. The guidelines are also in tandem with the “*National Strategic Plan for Solid Waste Management*” approved by the Government of Malaysia in July 2005, and will contribute to efforts to achieve a national Recycling Rate of 22 per cent in 2020.

HOW TO USE THE GUIDELINES

This set of guidelines comprises six (6) chapters. You may refer chapter by chapter to guide you to establish a new Source Separation (SS) Plan or to improve upon an existing one.

In the guidelines, **Examples** are provided for your consideration, and where relevant there are TIPS so that mistakes may be avoided.

There is also a **LIST OF CONTACTS** (Appendix 6), which lists out the names of key personnel at the three model LAs for you to send your queries directly to. Contact numbers, names of personnel (where available), websites and e-mail addresses are provided.

You may tailor your SS programmes and activities according to your LA's capacity, needs and expectations.

Your feedback is **IMPORTANT** to MHLG. Queries and comments may be directed to:

**Solid Waste Management Unit
Environmental Health & Engineering Division
Local Government Department
Ministry of Housing & Local Government
Level 4, Block K
Pusat Bandar Damansara
KUALA LUMPUR**

CHAPTER 1 INTRODUCTION

1.1 Toward a Material Cycle Society

The Malaysian Government is committed to realising a “*Material Cycle Society*” in Malaysia with a target recycling rate¹ of 22 % by the year 2020 as summarised in Figure 1- 1.

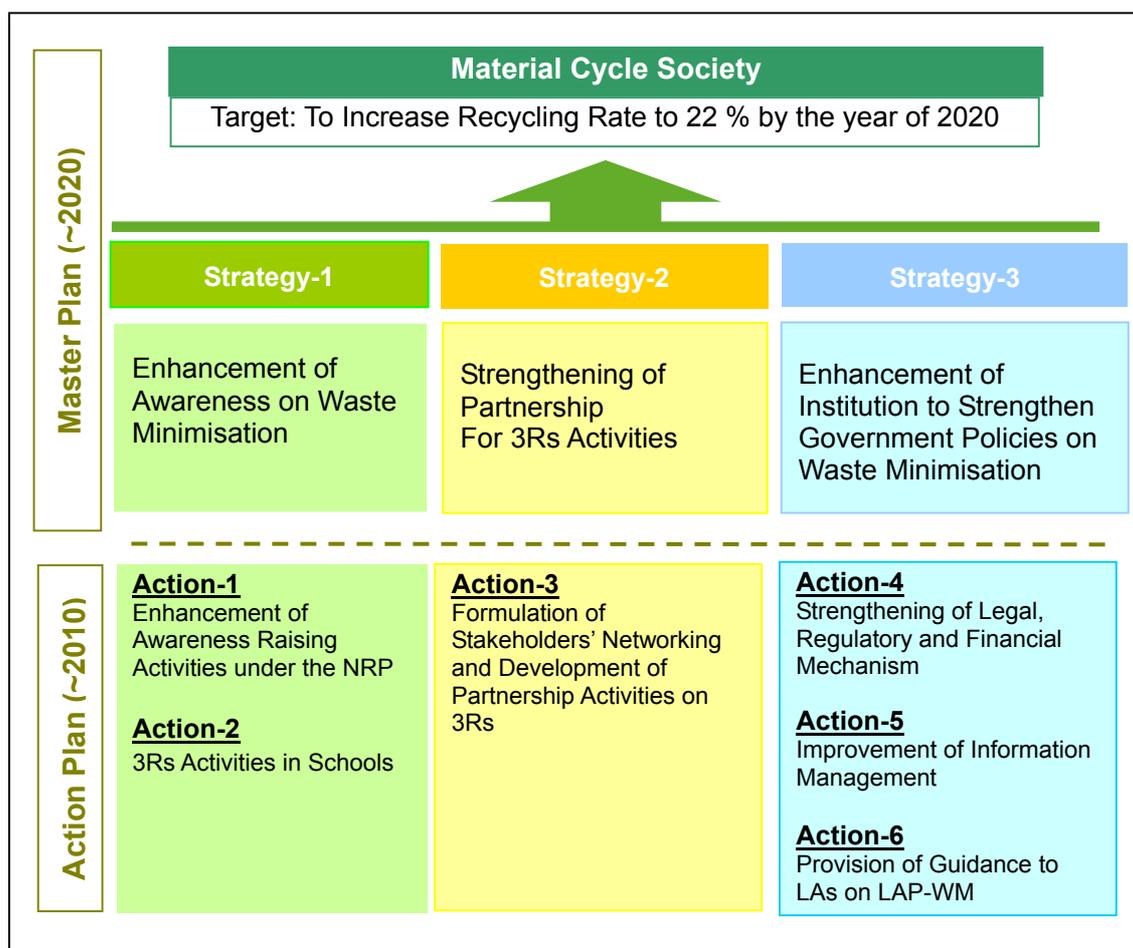


Figure 1- 1 Concept of Master Plan and Action Plan for Federal Government

1.2 Strategies & Action Plans

A three-pronged strategy has been adopted in the “*Waste Minimisation Master Plan*” which comprises:

- Enhancement of Awareness on Waste Minimisation
- Strengthening of Partnerships and Formulation of 3Rs Activities
- Enhancement of Institution to Strengthen Government Policies on Waste Minimisation

Under “Strengthening of Partnerships”, a key component of the waste minimisation

¹ Recycling Rate= $\frac{\text{Total Quantity of Recyclables Collected (TRC)} \times 100\%}{\text{TRC} + \text{Quantity of Waste Disposed} + \text{Others}}$

master plan is the implementation of ‘waste minimisation and source separation’ demonstration projects. This is spelt out in Action 3 of the “Waste Minimisation Action Plan for the Federal Government”.

Action 3:

Formulation of Stakeholders’ Networking and Development of Partnership Activities on 3Rs including Source Separation

At local government level, the Local Authority (LA) is expected to play an important role in initiating and coordinating the implementation of these SS activities. SS activities may be undertaken in selected target areas, and involving certain target groups of waste generators. SS will contribute towards efforts to achieve 22 % recycling rate in 2020.

1.3 Objectives of Source Separation: Why Do Solid Wastes Need to be Separated at Source?

Solid wastes should be separated at the point of generation in order to improve the recovery of recyclables. An increase in the quantity and variety of recyclables will lead to reduction in quantity of waste that needs to be disposed. Reduction of solid wastes destined for disposal leads to environmental and financial benefits including extending the lifespan of landfills, and lowering the risks of contamination of soil and water resources, and risks posed to public health. The ultimate objective is to create a “Environmentally Sustainable Society” in Malaysia (Waste Minimisation Master Plan, 2006-2020).

Material Cycle Society: Where waste minimisation is systemised and deeply enrooted in the lifestyle through:

- PARTICIPATION of all stakeholders
- Combined efforts based on PARTNERSHIP of stakeholders
- WILLINGNESS & PREPAREDNESS to minimise waste, with less government intervention
- 3Rs ACTIVITIES

1.4 Purpose of Guidelines

These guidelines are designed primarily to assist those LAs that have not begun any activities to encourage separation of solid wastes at source. Those LAs that already have waste separation at source programmes but are interested in improving the efficiency and effectiveness of the programmes may also use them. During the Study on National Waste Minimisation (2004-2006), three (3) SS Pilot Projects were carried out in 2005. The three model LAs are Majlis Perbandaran Pulau Pinang (MPPP), Majlis Perbandaran Subang Jaya (MPSJ), and Majlis Bandaraya Miri (MBM).

The guidelines focus on four components i.e. Planning, Awareness & Communication, Implementation, and Review & Improvement. The components and activities described in these guidelines may be modified according to the conditions prevailing in the LAs and according to the capacities of the LAs and of its partners. As far as possible, the SS exercise should be carried out using the existing capacities at the LAs. When necessary, the LAs may seek the advice of the three model LAs, or the services of consultants e.g. to assist in carrying out Waste Surveys, Awareness Campaigns and formulating Stakeholders Networking.

1.5 Role & Responsibilities of LA & Partners in Source Separation

In the context of the waste minimisation, the LA is the ‘Lead Agency’, which will initiate, facilitate and coordinate plans, programmes and activities to encourage more widespread adoption of waste minimisation, reducing and recycling initiatives, and contribute to achieving the national target of 22 % recycling rate.

The Waste Minimisation Unit (WMU), which is proposed to be established in each LA, will be the focal point for SS. In the interim, while awaiting the establishment of a WMU, the section or unit responsible for waste management and/or minimisation will be the most appropriate as lead agency. In particular the LA is expected to assume the following responsibilities:

RESPONSIBILITIES OF LA

- To initiate, plan, implement and coordinate SS activities
- To monitor performance of SS programmes & activities
- To report performance of SS programmes & activities
- To be the focal point for data & information connected with SS
- To facilitate networking and partnership among the stakeholders
- To be the link between the Federal Government and the State Government
- To be the model for SS to other organisations (“Leadership by Example”)

The LA needs to work in partnership with key stakeholders operating in its service areas. They can be grouped into the following categories:

- Solid Waste Generators
(e.g. Households, Government office, Business entities, Commercial, Industrial, Institutional, Community, etc)
- Recycling Players
(e.g. recyclable collectors & agents, recyclable processing plant)
- NGO/CBOs
- Other Government agencies
- Solid waste concessionaires & contractors

The Implementation structure and role of players in SS are shown below.

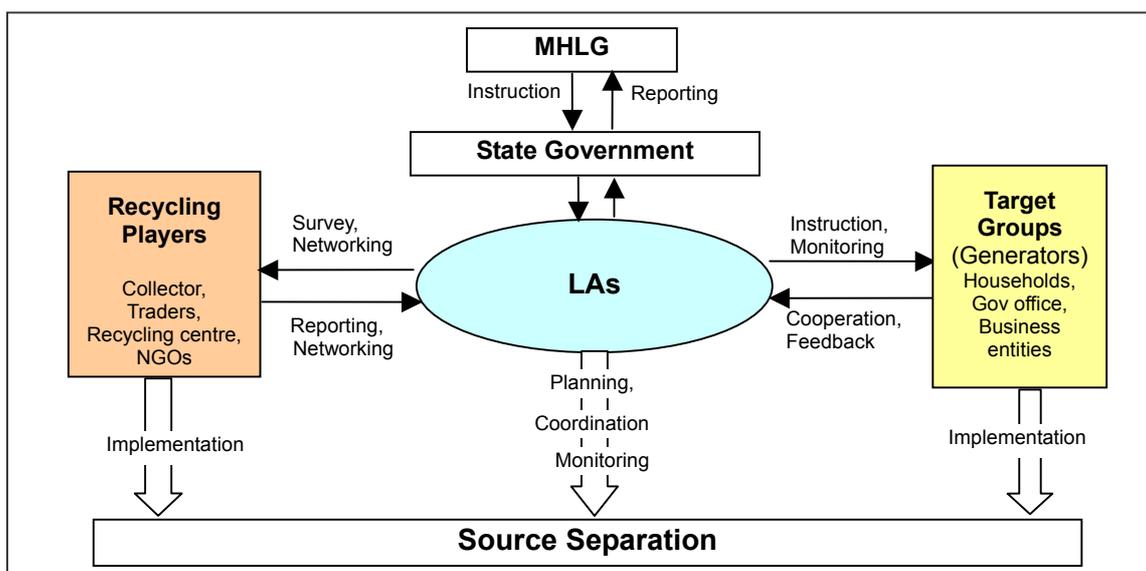


Figure 1- 2 Implementation Structure and Role of Players

1.6 How to Implement Source Separation

The implementation of a SS Plan consists of 5 main steps: -

- STEP 1: Formulating a SS Plan for LA
- STEP 2: Planning SS Programme in a Target Area
- STEP 3: Awareness & Communication
- STEP 4: Implementation & Monitoring
- STEP 5: Review & Improvement

Figure 1-3 summarises the key components of the Flow chart for implementation of source separation. The activities described in the Flow Chart may be carried out sequentially or concurrently.

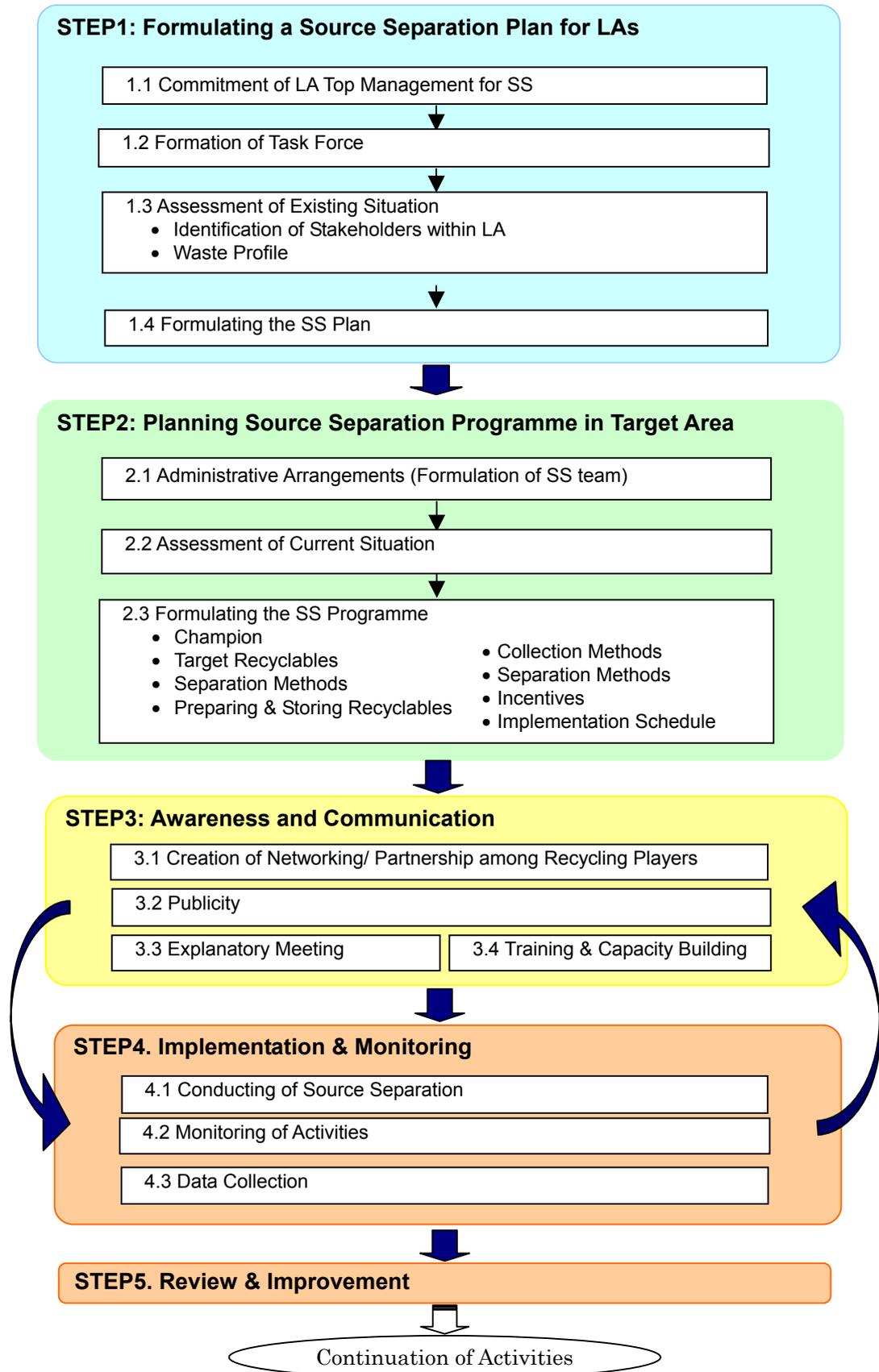


Figure 1-3 Flow Chart for Implementation of Source Separation

CHAPTER 2 FORMULATING A SOURCE SEPARATION PLAN FOR LAS

The Planning Process is critical in ensuring that the source separation (SS) Plan is acceptable and likely to be sustainable. This chapter describes the key elements of formulating a SS Plan at the LA level. The elements are:

1. Commitment of LA Top Management
2. Formation of a Task Force
3. Assessment of Current Situation
4. Formulating the SS Plan

2.1 Commitment of LA Top Management for SS

It is vital that the top management of the LA and its Councillors support the SS Plan and demonstrate their support e.g. via participation in the activities. It would also benefit the LA if the SS Plan receives support from the State EXCO in charge of Local Government and/or Environment as well as the Chief Minister.

As focal point, the WMU is responsible for initiating the administrative process of obtaining approval to proceed with SS from the LA's top management. This may be done by preparing a paper to propose the SS Plan. The main contents of this paper are:

1. Purpose of Paper
2. Introduction/Background to Waste Minimisation
3. Description of Proposed SS Plan
4. Justification or Benefits of SS Plan
5. Resources Required for SS Plan
6. Request for Approval to Proceed

2.2 Formation of Task Force

A Task Force (TF) comprising representatives of the key stakeholders should be set up for the purposes of guiding, monitoring and reviewing the SS programmes. The LA may select a group to be appointed as SS Task Force (TF). The criteria for their selection may include:

- Actively involved in SWM and WM activities
- Have experience in WM activities
- Have high potential in promoting SS
- Have important role in recycling e.g. SW concessionaire

The LA or any member of the TF may chair this TF, and the secretariat services are to be provided by the LA.

(Note: This Task Force need not to be a new one but may be an existing committee e.g. the Committee on Local Action Plan (C-LAP).

Objectives & Tasks of Task Force

The TF will guide and advise the LA in the process of formulating the SS programme. The tasks of the TF include: -

- Identifying key SWM issues that are likely to affect SS programme (Note: the key issues may have been identified during the process of preparing the LAP-WM);
- Facilitating collection of information and data on current SWM and waste minimisation activities,
- Identifying potential target areas/groups for SS activities and selecting the most suitable for the SS projects;
- Setting targets for SS in LA;
- Promoting the understanding and practice of SS among key stakeholders, and in target areas/groups;
- Reviewing performance of SS activities in target areas/groups; and
- Recommending measures to improve SS programme & activities.

2.3 Assessment of Existing Situation

In planning a system for separating solid wastes at source, it is necessary that the existing conditions be established and examined. Information that is required includes the following:

1. Stakeholders within LA (e.g., recyclable collector, recycler, trader, manufacturer, etc.)
2. Waste Profile and Waste Flow including waste amount generated within LA

2.3.1 Identification of Stakeholders within LA

The list of stakeholders is essential in establishing a good recycling network in the LA. It may include:

1. State / Local Government
2. Concessionaires and their contractors
3. Recyclable Collectors/ Recycling Industries/Recycling Agents
4. Collection Centres
5. NGOs/ CBOs
6. Manufacturers
7. Workshops e.g. car repair workshops
8. Schools/universities/institutes of higher learning
9. Religious houses e.g. mosque, church and temple

Stakeholders' Directory

It is recommended that this list be put together as a Directory of Stakeholders, and be updated periodically. The contents of the directories may include:

- Names and addresses of recycling players
- Types of activities engaged by each player, and recyclable items handled.

TIP: It may also be useful to provide information on how to prepare and store recyclables in the directory.

The Directory of Stakeholders may already have been prepared in the process of formulating the “*Local Action Plan for Waste Minimisation (LAP-WM)*”. MPPP, MPSJ and MBM have published their list of stakeholders as directories², prepared under the “*Study on National Waste Minimisation in Malaysia*”, and these are useful references.

² Penang Recycling Directory, MPPP, 2005, Stakeholder Directory, MPSJ, 2005
EcoPack, Miri City Council, Jan 2006

2.3.2 Waste Profile

The current waste profile and flow as well as other relevant data should be established (where data is not available) or verified (where there is existing data but outdated or incomplete) by conducting a Stakeholders Roundtable Discussion or by conducting a Waste Survey.

1) Stakeholders' Roundtable Discussion

Once the stakeholders have been identified, the TF should organise a Round Table Discussion, and invite key stakeholders to attend and other relevant government agencies.

These may be put together in a “Problem Tree”, where the core problems are defined and “Causes & Effects are identified for each problem. The TF may then formulate the objectives (or ends) and identify the actions that they plan to implement in order to achieve the objectives. This “Problem Tree” may be used as a basis for establishment of a suitable SS system, and enhance partnership networking.

< Objectives >

- To capture current status of recycling activities in the LA
- To identify key issues and problems pertaining to waste minimisation

< Target Group >

Recycle agents, community leaders, NGOs, solid waste concessionaires, relevant departments in LA (e.g. Urban Services, Health Department) and other relevant government agencies.

< Discussion Topics >

- | | |
|--|---|
| <ul style="list-style-type: none">• Current activities by the Waste Minimisation stakeholders/players<ul style="list-style-type: none">- Operation area- Recyclable items and amount to be handled- Flow of recyclable items• Existing conditions of recycling activities at target area<ul style="list-style-type: none">- Waste collection system- Current collector appointed- Existence of informal/individual recycling activities within the area- Current SS activities | <ul style="list-style-type: none">• Waste Minimisation Issues<ul style="list-style-type: none">- Recyclable collection system- Behavioural issues- Infrastructure issues- LA Capacity issues• Possible Solutions to Address Issues<ul style="list-style-type: none">- SS- Recyclable collection system- Behavioural issues- Infrastructure issues- LA Capacity issues |
|--|---|

(Note: The Roundtable Discussion may already have been carried out in the process of formulating the “Local Action Plan for Waste Minimisation (LAP-WM)”. The findings may be used in formulating the SS Plan. However, another roundtable discussion may be organised to discuss issues specific to SS).

2) Waste Flow Survey

Waste flow should be identified to capture the most up-to-date conditions on stakeholders, and to establish the baseline information of waste minimisation particularly on recycling in the target area.

General waste flow in Malaysia is illustrated as in the Appendix 1. LAs need to identify the recycling players and prepare the waste flow within own area. This flow can be used to create new networking among stakeholders to strengthen recycling wheel.

In some cases, the information should be captured not only within the LA boundary but include the surroundings and /or adjacent large-scale LA.

< Objectives >

- To identify and register all stakeholders operating within the target area and LAs
- To capture the amount and types of recyclable materials collected by stakeholders
- To capture information on the recycling activities by stakeholders

< Target Group >

- Recyclers and Manufacturers who accept recyclables
- Recycling Stations and Centres;
- Traders, Middleman and Junk Shops who deal in recyclables;
- Street Collectors;
- Manufacturing Factories;
- Commercial Establishments and Office; and
- Household

< Data to be collected >

- Types amount and price of recyclable materials
- Buyers/ sellers of recyclables
- Factors affecting recycling activities (not necessarily)

< Procedure >

- Survey sheets by target group should be prepared.
(Attached template “Survey Sheet (Attachment 2)” may be referred to.)
- Survey may be carried out in two ways, i.e. face-to-face interview, and mailing surveys. The mailing survey was further divided into two, first is by ordinary mails and the other is by hand delivery to the target respondent. To get good response from the target, face-to-face interview is preferred to ordinary mailing survey.

2.4 Formulating the SS Plan

Based on the findings of the above actions, the LA is able to formulate an SS Plan. This plan may be an annual plan that describes the objectives and targets; the proposed programmes and activities; and the resources required for implementing them. This process may be guided by the SS Task Force. This plan should then be forwarded for approval of the LA’s top management, following the same process described in section 2.1.

The SS Plan would consist of:

1. Programmes & Activities
2. Key Performance Indicators
3. Monitoring Plan
4. Budget
5. Schedule of Implementation

2.4.1 Programmes & Activities

This refers to selection of the SS programmes and activities.

In describing the SS programmes, the main element is the selection of the target areas/groups. The LA has to propose the number and location of the SS programmes for a particular plan period. This is elaborated below.

1) Selecting the Target Area/Groups

The LA will need to select the target area or groups for implementing the SS Programme. The targets refer to two aspects; the spatial and the types of SW generators. The spatial aspect refers to the delineation of an area for introducing SS practices. The generators refer to the sources of waste, and the type of wastes selected to be separated at source.

The target areas may be a residential area, a commercial area or an industrial area. The composition and the size of the area/groups need to be determined. Possible target groups are as listed below:

- Households
- Institutions (Government offices, schools, universities)
- Business entities (commercial and service establishments including offices, restaurants, hotels, hospitals, supermarkets and markets etc.)
- Community facilities (e.g. halls, parks)

For the selection of target area/group, the following criteria may be used.

Table 2-1 Selection Criteria for Pilot Project for Separation of Solid Waste at Source

| No. | Criteria |
|-----|--|
| 1 | Types of houses, religious beliefs, racial mix, accessibility etc. |
| 2 | Types of business entities |
| 3 | Relevance to LA's 3Rs programme, e.g. in conjunction with planned programme or facilities such as newly developed drop-off centres |
| 4 | Presence of "Champions" (local leaders) and commitment to waste minimisation |
| 5 | Cooperative and willing residents and/or business entities. |
| 6 | High level of awareness of recycling among members of target group. |
| 7 | Willingness of waste or recyclable collector and/or recycling agent to be involved |
| 8 | Past experience in recycling |
| 9 | Other supporting pre-conditions |

This target area will serve as a test and model for expansion of SS to other areas in the future. Once the target area/group has been selected, then the detailed planning will involve specifically the needs and expectation of that particular area or group. This is described in Chapter 3.

2.4.2 Key Performance Indicators

Key performance indicators (KPIs) are useful in measuring the performance of SS programmes and activities. The KPIs will provide an indication of their applicability and effectiveness. They will also serve to indicate the benefits of SS in WM. Some KPIs that may be considered are shown below:

- Overall Recycling Rates (increase)
- Quantity of Waste Destined for Landfills
- Level of Participation on SS

2.4.3 Monitoring Plan

In order to monitor and evaluate the progress and performance of the SS programmes and activities, a Monitoring Plan is to be prepared, which will be carried out during the implementation stage. This Monitoring Plan would be based on the Key Performance Indicators selected (described above).

The data under this monitoring exercise may be collected directly by the LA or reported by its SS partners e.g. recyclable collectors and agents. The data is critical in the process of improving the database for WM and SS, so that future planning and decision-making may be based on more reliable information.

Two examples of KPIs and the parameters to be measured are shown in the table below.

Table 2-2 Examples of KPIs and Parameters to be Measured

| No. | KPI | Monitoring Parameters |
|-----|--|--|
| 1 | Recycling Rates/ Rate of Recovery of Recyclables | 1. Quantity of Waste Generated or Quantity of Waste Collected from Target Area 2. Quantity of recyclables collected from Target Area (per day/month/year) |
| 2 | Level of Participation in SS | 1. Number of sources/ waste generators in target area 2. Number of sources/ waste generators in participating in SS in target area |

2.4.4 Budget

After the programmes and activities have been identified, the LA would need to develop a budget for implementing the SS Plan. The budget will depend on the scale, coverage and frequency of programmes and activities selected. The budget will consist of allocation for operating and development purposes.

2.4.5 Schedule of Implementation

If the LA decides to prepare an Annual Plan, then the programmes and activities will be spread out over a one-year period. Some will be carried out on a continuous basis while others may be periodic events. The schedule of the implementation of an SS Plan may resemble the one shown in Table 2-3.

Table 2-3 Sample Schedule for Implementation of SS Plan for Year 1

| No | SS Annual Plan | Month | | | | | | | | | | | |
|----|---|-------|---|---|---|---|---|---|---|---|----|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | Obtain LA top management approval to implement SS | X | | | | | | | | | | | |
| 2 | Establish task force & arrange meetings | X | | | X | | | | | | | | |
| 3 | Assess existing situation & prepare report | | X | X | | | | | | | | | |
| 4 | Prepare SS Plan | | | | X | | | | | | | | |
| 5 | Obtain LA top management approval for SS Plan | | | | | X | | | | | | | |
| 6 | Implement SS Plan | | | | | | X | X | X | X | X | X | X |
| 7 | Carry out awareness programmes | | X | X | X | X | X | X | X | X | X | X | X |
| 8 | Establish or enhance recycling network | | X | X | X | X | X | X | X | X | X | X | X |
| 9 | Monitor & measure parameters for KPIs | | | | | | X | X | X | X | X | X | X |
| 10 | Assess performance & review | | | | | | | | | | | X | |
| 11 | Prepare report for LA top management | | | | | | | | | | | | X |

Capacity Development

The LA may want to propose capacity development of its personnel. It may propose the training programmes that its personnel may undergo.

Training may be held in-house. In this case, trainers may be the LA's own personnel with SS experience, from other LAs, or resource persons invited from outside the LAs e.g, consultants with experience in WM and SS. Personnel may also be sent for training outside the LA e.g. at training courses conducted by MHLG or by other relevant organisations.

MHLG established a "Core Team" for waste minimisation, which comprises MHLG officials in charge and officers of MPPP, MPSJ, MBM who have implemented source separation pilot project under the "Study on National Waste Minimisation in Malaysia." The LA may seek the advice and support for training from them.

CHAPTER 3 PLANNING SS PROGRAMME IN TARGET AREA

The success of source separation (SS) activities depends on cooperation and commitment of the participating stakeholders. Once the SS Plan has been formulated as described in Chapter 2, the planning of programmes and activities at the target area level may begin.

This chapter describes the actions and important steps involved in conjunction with a selected target area. The key actions involve the following matters:

1. Administrative Arrangements (Formulation of a SS Team)
2. Assessment of Current Situation
3. Formulation of the SS Programme

3.1 Administrative Arrangements (Formation of a SS Team)

A SS Team comprising key stakeholders in the target area should be set up for the purposes of planning, monitoring and promoting the SS activities. As with the LA Task Force (TF), the members of this team should comprise representatives of the target area and key SS stakeholders. Similar criteria may be used to select and appoint team members and may include:

- Keen interest in SS
- High potential for influencing participants in target area
- Have important role in recycling e.g. SW concessionaire and recyclable collector

The LA will provide guidance and coordinate the activities, according to the needs and preferences of the team.

3.2 Assessment of Current Situation

As with planning at the LA level, it is recommended that the existing situation in the target area be assessed. This exercise may include:

- Assessment of current recycling practices
- Determination of flow of recyclables from generator to final destination
- Determination of existing levels of recycling & SS
- Determination of existing level of awareness of SS and waste minimisation

The KPIs may be used to determine what parameters are to be measured. Table 2.2 can be referred to for example of monitoring parameters.

For level of awareness, a survey may be carried out. This survey is carried out first before SS begins, and then another after a reasonable period. This is done in order to determine if there are any changes in level of awareness after the participants have been exposed to more information and have taken part in SS campaigns and other activities. An example of an Awareness Survey Questionnaire is shown in **Appendix 3**.

3.3 Formulating the SS Programme

At the target area, the SS Team and the LA will be involved in a number of tasks in planning and preparing participants to practise SS. This involves the selection of:

- | |
|--|
| <ol style="list-style-type: none"> 1. Champion (s) for SS 2. Target Recyclables 3. Separation Method (s) 4. Method of Preparing & Storing Recyclables 5. Method of Collecting Separated Recyclables 6. Recyclable Collector 7. Frequency of Collection 8. Incentive System |
|--|

When all the above have been selected, the SS Team may put together a “Schedule of Implementation”.

3.3.1 Identification of a Champion in Target Area

It is recommended that a target area for SS selects a “Champion”. This champion has an important role in promoting SS among the participants, in getting assistance and support of participants for activities, and as a liaison between the target area and LA. This was demonstrated in the SS Pilot Projects in MPPP and MBM. This champion is someone who lives in the area, and is well known by residents. The person would have the following characteristics:

- | |
|--|
| <ul style="list-style-type: none"> • Have a passion & keen interest in SS and other matters related to well-being of the community • Well-known personality & well regarded by community • Have high potential for influencing participants in target area • Have good working relationship with the LA & other relevant organisations |
|--|

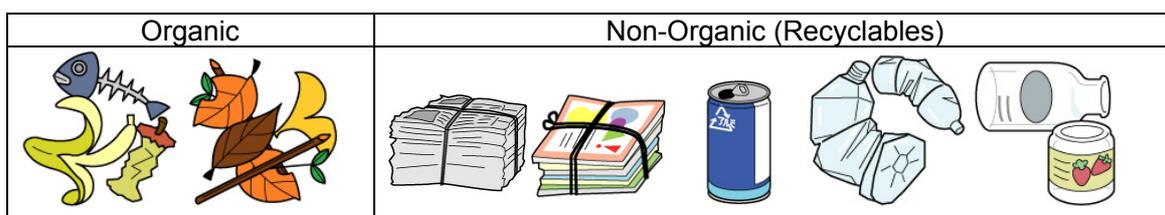
3.3.2 Selecting Target Recyclables

Based on the information obtained through waste flow survey and round-table discussion, target recyclables to be collected and the segregation method should be determined. Selection of target recyclables may be done at the LA level or at the target area/group level. At target area/group level, selection will be based on existing information about recyclables generation and from preference of the participants. The types may vary from one area to another.

< Main Recyclable Items to Separate >

Generally, the wastes can be classified into 2 groups;

- Organic: Kitchen wastes, Garden wastes,
- Non-Organic (Recyclables): Paper, Aluminium cans, Plastic, Glass bottles, etc.³



In addition to the main recyclable items mentioned above, the LA may consider collecting other items including the following:

³ Among the non-organic waste, these guidelines focus on 4 items, i.e., paper, glass, metal and plastic.

- Used or old clothing
- Rubber-based items
- Wood items
- Used car batteries
- e-waste (electrical and electronic equipment such as computers and peripherals from consumers excluding from manufacturing industries)

The decision on whether to collect these additional items will depend on their availability in the target areas/groups and on market demand.

TIP

Used clothing is usually collected for donation to charity organisations or for distribution in times of emergencies or disasters e.g. for fire or tsunami victims.

3.3.3 Separation Methods

The most basic way to segregate wastes is to classify wastes into two groups. However, the non-organic (recyclables) can be segregated further, based on the local conditions such as level of awareness or willingness among the target groups, policy of LA, and how recyclers are collecting recyclable items, etc. Table 3-1 shows four levels of separation that may be considered. At the basic level, solid wastes are separated into two; the organics and the recyclables i.e. paper, plastics, glass, metals are collected and placed together separately from the usually wet organics. However to avoid contamination (paper may get wet) and facilitate storage and measurement of quantity and determination of value of each type of recyclable, ideally each group of recyclable should be collected and stored separately.

Table 3-1 Alternatives of Separation Method

| Category | 2 Items Separated | 3 Items Separated | 4 Items Separated | 5 Items Separated |
|----------|-------------------|-------------------|-------------------|-------------------|
| Organic | Group 1 | Group 1 | Group 1 | Group 1 |
| Paper | Group 2 | Group 2 | Group 2 | Group 2 |
| Glass | | Group 3 | Group 3 | Group 3 |
| Metals | | | | Group 4 |
| Plastic | | Group 4 | Group 5 | |

Based on availability and capacity of recyclers', non-organic recyclables can be further divided into sub-categories. Table 3-2 below shows the sub-categories for each target item for further consideration.

Table 3-2 Sub-Category of Recyclables

| Main Category | Sub-Categories |
|------------------------------------|--|
| Paper (Kertas) | <ul style="list-style-type: none"> • 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>) |
| Glass (Bottle) (Bekas Kaca) | <ul style="list-style-type: none"> • Clear (Flint) (<i>Jernih</i>) • Coloured (Amber/Green) (<i>Berwarna</i>) • Mixed Glass (<i>Kaca Campur</i>) |
| Plastic (Plastik) | <ul style="list-style-type: none"> • 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>Plastik Fom</i>) • Other Plastics (<i>Plastik-plastik lain</i>) |

| Main Category | Sub-Categories |
|-----------------------|--|
| Metals (Logam) | <ul style="list-style-type: none"> Aluminium Cans (<i>Tin Aluminum</i>) Ferrous (<i>Besi / Keluli</i>) Non-Ferrous Metals (<i>Bahan Bukan Besi</i>) |

3.3.4 Preparing & Storing Recyclables Prior to Collection

Once the types of recyclables to be separated are decided, and the level of separation is selected, it is important to ensure that as far as possible the separated recyclables meet the specifications of the collector/receiver, i.e., end users, and/or manufacturers. The specifications may include the types of recyclable materials that can be commingled and allowable contamination limits.

For example, some recyclers may require that coloured and colourless glass bottles be separated before they are collected.

In storing recyclables for collection, different containers may be considered. They are:

- Bins (individual or communal)
- Plastic bags (reuse shopping bags or provide special bags for recyclables)
- Boxes (reuse cardboard boxes or provide special boxes for recyclables e.g. for paper)

Examples of collection containers are shown in **Appendix 4**.

3.3.5 Selecting Method of Collection of Recyclables

Collection of recyclables from the sources should be determined taking into account current waste collection system and capability of collectors, recyclers, etc. Generally, there are two types of collection methods;

- Door to Door Collection
- Station Collection

a) Door-to-Door Collection

Door-to-door collection is the collection system in which the collector goes around the target area and collects recyclables from house to house. This method is also referred to as “Kerbside Collection”. Residents are required to separate recyclables from other wastes, and to place them into plastic bags (or bins) separately. They need only to bring recyclables to the front of their house or gate on collection day. The general scheme of door-to-door collection is as shown in Figure 3-1.

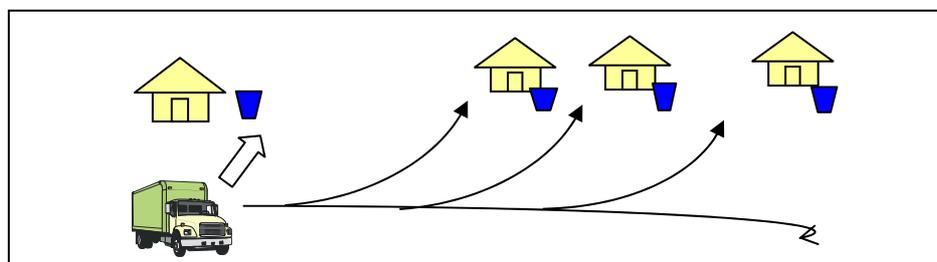


Figure 3-1 Image of Door-to-Door Collection

TIP

The recycling agent can play a jingle during his rounds in the target area. This will create a festive mood and also announce the arrival of the recycling truck.

<Equipment>

There is little equipment and capital cost required. The recyclables may be stored in either waste bins or plastic bags.

TIP

Bins and bags for recyclables may be of a different colour from the one used for organics

<Advantages>

- Residents do not need to go far to deposit their recyclable items.
- LA does not need to build a permanent collection place.

<Disadvantages>

- Recyclable collectors may incur higher costs for collection
- Residents need a place for storage of their waste within their houses until collection day.

b) Station Collection

Station collection is the collection system utilising drop-off points set up within or near the target area. Residents are required to separate recyclables in the same way as door-to-door collection, and in addition are required to bring the recyclables to the drop-off points. The recyclables collector needs only to go to the drop-off points to collect recyclables.

The station may also operate as a “Buyback Centre”, i.e. recyclables are exchanged for some form of incentive. Such incentives are described in Section 5.3. The station may be operated by the LA or handed over to a capable NGO/CBO.

The general scheme of station collection is as shown in Figure 3-2.

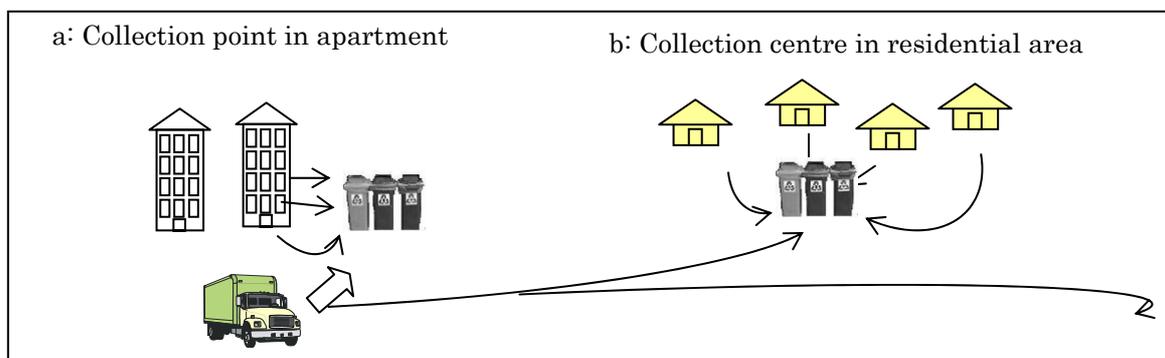


Figure 3-2 Image of Station Collection

<Equipment>

A station for collecting and storing recyclables brought in by generators needs to be set up. The design for such stations varies according to the needs of the area being served. The MHLG has standard designs for drop-off centres, which may be modified according to local conditions. Their location needs to be strategically selected to encourage the public to bring their recyclables. Some stations are manned at specific times while others are designed to receive recyclables through hoppers. These centres are provided with collection and/or storage receptacles. The size, type and number of containers are selected based on the number of residents covered, estimated amount of recyclables and collection frequency.

<Advantages>

- Saves on labour cost and time (for waste generator)
- Saves on labour cost and time (for recyclable collector)

<Disadvantages>

- Space and containers are needed for the station or drop-off centre
- The station needs to be manned especially if a “Buy-back” system is used
- Residents need to bring their recyclables to the station
- The station needs to be secure to prevent theft of valuable recyclables
- The station needs to be maintained so that it is clean and do not pose any hazards to the community

TIP

Drop-off and Buy-back centres have been set up at the following locations: -

- Shopping complex, Market
- Public Park
- Next to Rukun Tetangga Office/Police Beat
- Near Schools

TIP Door-to-door collection and station collection may be combined.

3.3.6 Selecting Recyclable Collector

The role of the Recyclable Collector is important in ensuring the sustainability SS programme. The criteria that may be considered in selecting a collector are shown below.

- Possess good track record of collection services (for SWM or recyclables)
- Have adequate vehicles and personnel
- Willing to take risk of fluctuating quantities of recyclables
- Willing to work closely with LA and the “Champion” in target area
- Possess valid business licence and commercial vehicle licence

3.3.7 Determining Frequency of Collection

Collection Frequency should be decided based on the estimated collection amount of recyclables and availability of collectors and/or recyclers. In a residential area, recyclables may be collected once a week whilst from a station, the recyclables may have enough storage space for fortnightly collection.

3.3.8 Selecting Incentives

In the foregoing, it was mentioned that recyclables may be exchanged for incentives at collection stations. Incentives are not always required but are worth consideration as they may be effective to encourage people to join in SS activities, particularly during the early stage. Incentives may be monetary or non-monetary in nature.

a) Monetary Incentives

Monetary incentives can be considered in various forms;

- Direct cash payout for the sales of recyclables, e.g., buy back campaign
- Subsidies for collection of unprofitable items to communities or to recycling agents

b) Non-monetary Incentives

Non-monetary incentives that can be considered are:

- Gifts such as coupons, car parking tickets, pens, bags, key chains that carry the relevant messages
- Free attendance at workshops
- Free distribution of booklets and other relevant materials for awareness
- Returns to the community for expenditure saved on waste disposal to the landfill in terms of construction of community facilities such as landscaping, parks and other public amenities.

In the three Pilot Projects, the SS programmes involved different target areas, separation methods, collection methods and incentives. These features of the projects are summarised in **Appendix 4**.

CHAPTER 4 AWARENESS & COMMUNICATION

As mentioned in Chapter 3, awareness programmes are essential in promoting SS and in raising the level of participation in the target area. There are various ways of enhancing awareness and educating participants on proper recyclable handling methods.

This chapter describes three important aspects of enhancing awareness and facilitating communication:

1. Networking & Partnership among recycling players
2. Publicity
3. Explanatory Meetings
4. Training of Trainers

4.1 Creation of Networking/ Partnership among Recycling Players

In order to promote and sustain SS, it would be beneficial to establish and maintain a network among recycling players. Such a network may already exist on an informal basis at the LAs and measures to strengthen it would benefit waste minimisation efforts.

The benefits of networking include the following:

- LA recognises existence and role of different players, and vice versa
- Facilitate LA's task of co-ordinating SS and other waste minimisation efforts
- Facilitate interface and matchmaking initiatives e.g. between a specific recyclable generator and a re-processing plant
- Provide an avenue for a collective say on matters related to waste minimisation

This network may be set up using the List of Stakeholders established (Section 2.1). In addition, a Stakeholders' workshop may be organised.

4.1.1 Stakeholders' Workshop

The TF/LAs may organise a workshop or a series of workshops. These workshops will allow stakeholders to clarify their role in the SS system. The flow of recyclables from generator to final destination will be charted. The workshops will also serve as forum to share experiences on 3Rs, and to disseminate 3Rs information to a wider audience. Figure 4-1 shows a typical flow of recyclables and the main roles of each group.

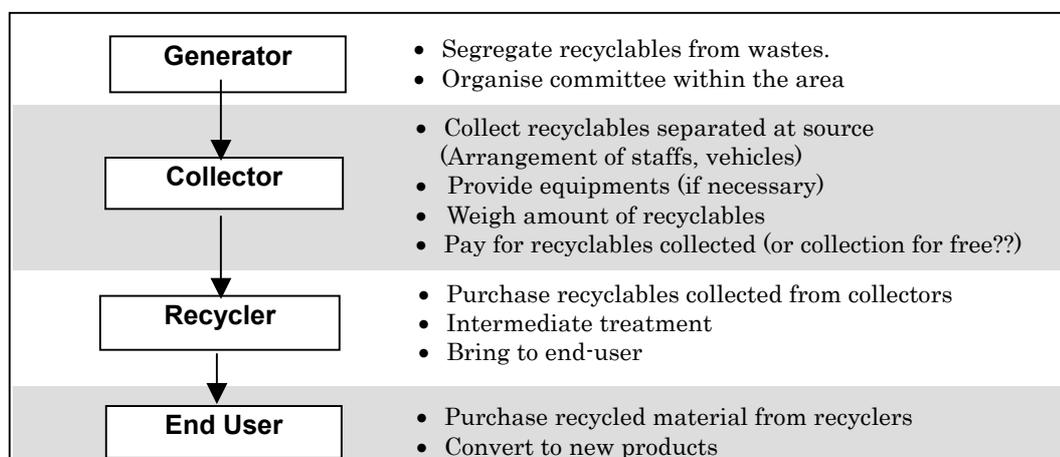


Figure 4-1 Flow of Recyclables and Possible Roles for Each Player

TIP

LAs should monitor that recyclables separated at source reach the end-users and are put to good use, without illegal dumping of less valuable recyclables.

4.1.2 Stakeholders' Directory

The Stakeholders' Directory described in section 2.3.1 should be distributed to SS participants. Depending on resources available, the SS Team may prepare a Stakeholders' Directory specific to the target area. This directory should contain similar information as previously described, as well as names and contact numbers of the Champion (s). This is to enable participants to direct their queries and complaints to the relevant persons so that remedial and improvement measures can be taken as soon as possible.

4.2 Publicity

4.2.1 Campaigns

Conducting campaigns on SS would be a good way to attract people to SS activities. Campaigns may include a launching ceremony to be held at the beginning, and other activities to be held periodically during the implementation period.

<Launching Ceremony>

SS activities or a pilot project may be launched by a VIP at local or state level. This will ensure that the event is reported in the media, preferably at national level. The launch should be attended by a wide range of people including residents of target area, NGOs/CBOs, concessionaires, recyclers, school children and end users.

TIP

Campaigns and Launching ceremony should be designed to include a festive and fun element where all members of the family may participate. They may include:

- Games
- Competitions
- Showcase of 'Success SS Stories'
- Presentation of awards or other means of recognition
- Distribution of 'Door Gifts' e.g. Reusable Shopping Bags

< Periodic Awareness Activities>

Awareness activities should be carried out in order to enhance awareness on SS and to maintain the peoples' interest to practise SS and other waste minimisation measures. Awareness activities may include the following:

- Demonstration of good practices of SS and other waste minimisation measures by various groups such as schools, NGOs, hospitals, factories.
- Introduction of Awards or a recognition scheme for good waste minimisation and SS practices.
- Round table meetings to discuss local issues on SS, and on waste minimisation, in general
- Exhibitions and participation in other activities e.g. special events such as TV3's "Jom Heboh" Carnivals.

- Distribution of relevant information, pamphlets, brochures etc.
- Special Camps with WM and SS components.
- Visits to organisations practising SS and other relevant organisations e.g. recyclable re-processing plant.

4.2.2 Tools for Publicity

SS activities must be publicised as wide as possible in order to encourage participation. The TF should collaborate with the printed and electronic media to publicise events and activities as well as performance of SS initiatives. It is important that information materials be designed (for appropriate target groups) and disseminated in various forms e.g. website, signboard, flyers, and leaflets. The followings tools may be used for publicity and promotion purposes:

Flyers

Contents of flyers may include following;

- Basic information on 3Rs
- Objectives of source separation
- Segregation method
- Collection schedule, and collection points
- Contact address

Signboards, Banners & Streamers

Placing signboard and banners in public strategic places is effective to encourage participation in SS activities.

Websites

A website can be a useful tool to disseminate information to the general public. The website may post the latest news and events happening on the local and international scene regarding waste minimisation and source separation.

Press Releases and News Coverage

Newspapers are effective as a tool for publicity. The LA may call a press conference or issue a Press Release to publicise SS events and to invite participation of stakeholders.

Examples of those tools employed by MPPP, MPSJ and MBM are shown in Appendix 4.

4.3 Explanatory Meetings

In a pilot project area or selected SS area/groups, explanatory meetings have to be held by the TF and involving the local Champion and the local group leaders.

The explanatory meetings may cover the following subjects and include exhibitions and demonstrations e.g. of recyclable preparation and storage:

- Explanation of waste minimisation and the 3Rs
- Objective(s) of SS
- Expectations of SS
- Past experience of SS

- Role of participants
- Methods of separation of recyclable items
- Methods for collection of separated wastes
- Correct use of bins or containers provided
- Frequency and time of collection of recyclables
- Role of recyclable collector
- Incentives
- Other relevant information

TIP

- Information materials should be ready for distribution at explanatory meetings
- Explanatory meetings may be held during the weekend and ensure sufficient notice is given to participants
- Name & address of local contact person(s) should be made available
- It is suggested that LA send official letters to each participant informing on the project and explanatory meeting. To assemble people as many as possible, LA may prepare incentive (e.g. Door Gifts, etc) which will be provided at meeting and indicate it in the letter.

4.4 Training & Capacity Building (Creation of Champions)

Existence of key persons who are interested and willing to spend time and effort to promote 3Rs activities is one of the key conditions sustain waste minimisation including SS. In order to foster champions on 3Rs at the local level, training sessions should be conducted periodically. This may be organised by the TF. The training programme will include waste management & minimisation, national and local policies and plans, how to segregate recyclable items, how to brief to the community members etc., and how to facilitate meetings in the community.

Those trained may be called upon to be trainers when SS programmes are introduced to new target areas.

The LA may seek advice and trainers to coordinate trainers' training from the "Core Team", which comprises MHLG and 3 model LAs, i.e., MPPP, MPSJ and MBM.



CHAPTER 5 IMPLEMENTATION & MONITORING

Once the SS Programme has been formulated for a target area, as described in Chapter 3, the implementation of programmes and activities may begin.

This chapter describes the actions and important steps involved in the implementation stage.

5.1 Conducting of Source Separation

To implement SS programmes and activities smoothly, it is suggested that the LA prepares the schedule for the implementation of SS Programme, and carries out SS following the schedule.

The schedule may resemble the one shown in Table 5-1 below. Detailed information about enhancing awareness and activities during implementation stage is described in Chapter 4 and Chapter 5 respectively.

Table 5- 1 Proposed Schedule for Implementation of SS Plan for Year 1
In Target Area _____

| No | SS Plan | Month | | | | | | | | | | | |
|----|--|-------|---|---|---|---|---|---|---|---|----|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | Establish SS Team & arrange meetings | X | | | X | | | | | | | | |
| 2 | Assess existing situation & prepare report | | X | X | | | | | | | | | |
| 3 | Prepare SS Programme | | | | X | | | | | | | | |
| 4 | Implement SS Plan -Acquire recyclable containers -Distribute containers | | | | | | X | X | X | X | X | X | X |
| 5 | Carry out awareness programmes -Prepare information materials -Explanatory meetings -Launching of SS -SS campaigns | | X | X | X | X | X | X | X | X | X | X | X |
| 6 | Establish or enhance recycling network | | X | X | X | X | X | X | X | X | X | X | X |
| 7 | Monitor & measure parameters for KPIs -Quantities of recyclables -Level of participation - Awareness survey | | | | | | X | X | X | X | X | X | X |
| 8 | Assess performance & review | | | | | | | | | | | X | |
| 9 | Prepare report for LA/SS task force | | | | | | | | | | | | X |

In the implementation stage, the key actions are:

- Acquire & distribute containers for recyclables
- Provide adequate information on segregation, preparation, storage and transfer to collector
- Ensure regular collection services at designated times
- Provide avenue for feedback and complaints (to Champion or LA SS Task Force Secretariat)

5.2 Monitoring of Activities

Monitoring and evaluation of source separation activities should be carried out periodically.

Actions for monitoring are as follows: -

- Periodical visit to target groups/area by SS Team & LA
- Measurement of quantities of recyclables according to type
- Public opinion survey
- Data collection, record & analysis (from collectors to LA SS Task Force Secretariat)
- Feedback to SS participants on SS performance

5.3 Data Collection

Monitoring data should be compiled. Data need to be compiled at different levels:

- **LA:** Recyclable generation/collection data in LA (by LA from collectors in various target areas)
- **Target area:** Recyclable generation/collection data in target area (by collector & reported to LA)

Recyclable collectors shall report data to the LA SS Task Force Secretariat. The LA SS Task Force Secretariat will then consolidate data from all collectors for reporting to the MHLG and for preparing periodic performance reports to LA top management.

Performance information may be disseminated to the public for awareness purposes.

For collection and recording of data on recyclables collection, a standard format should be used. The standard report format for the LA to report to MHLG is shown in **Appendix 5**.

CHAPTER 6 REVIEW & IMPROVEMENT

6.1 Review

Findings from monitoring need to be analysed and reports prepared. The findings will indicate whether the targets have been achieved. If the targets **have not been achieved**, then actions should be taken to correct or remedy the situation. Corrective actions may include making changes to the targets, programmes and activities. They may also involve organisational, technical, financial and strategic matters. If the targets have been met, then the LA may decide to revise the targets, expand the programmes or begin new ones.

6.2 Improvement

Improvement may involve actions at the LA level or at the target area level.

6.2.1 Target Area Level

After reviewing the results of monitoring, the SS Team may want to make changes to increase the efficiency of collection or to raise the level of participation. They may also want to expand in terms of area of coverage or to add other recyclables to the four main recyclables. They may also want to practise composting of organic wastes. In this event, the LA should provide support and assistance. The LA may have to request for additional resources, particularly if the results indicate a high likelihood of increasing the recycling level and of reducing the volume removed for final disposal.

6.2.2 LA Level

The LA will have to review performance at each target area, and the consolidated results of a number of target areas. They may decide to make similar changes as those at target area level. They may also want to expand SS to other target areas. This may involve the introduction of different levels of separation e.g. from a 2-level separation to 3-level separation (refer to Table 3-1). The LA may also consider introducing different modes of storage, collection and incentives.

Such changes may require the LA to request for additional resources, or assistance from MHLG. As a learning process, the LA should share its experience with other LAs.

APPENDICES

Appendix 1: Waste Flow in Malaysia

Table below shows general waste flow in Malaysia. LAs need to identify the recycling players and prepare the waste flow within own area.

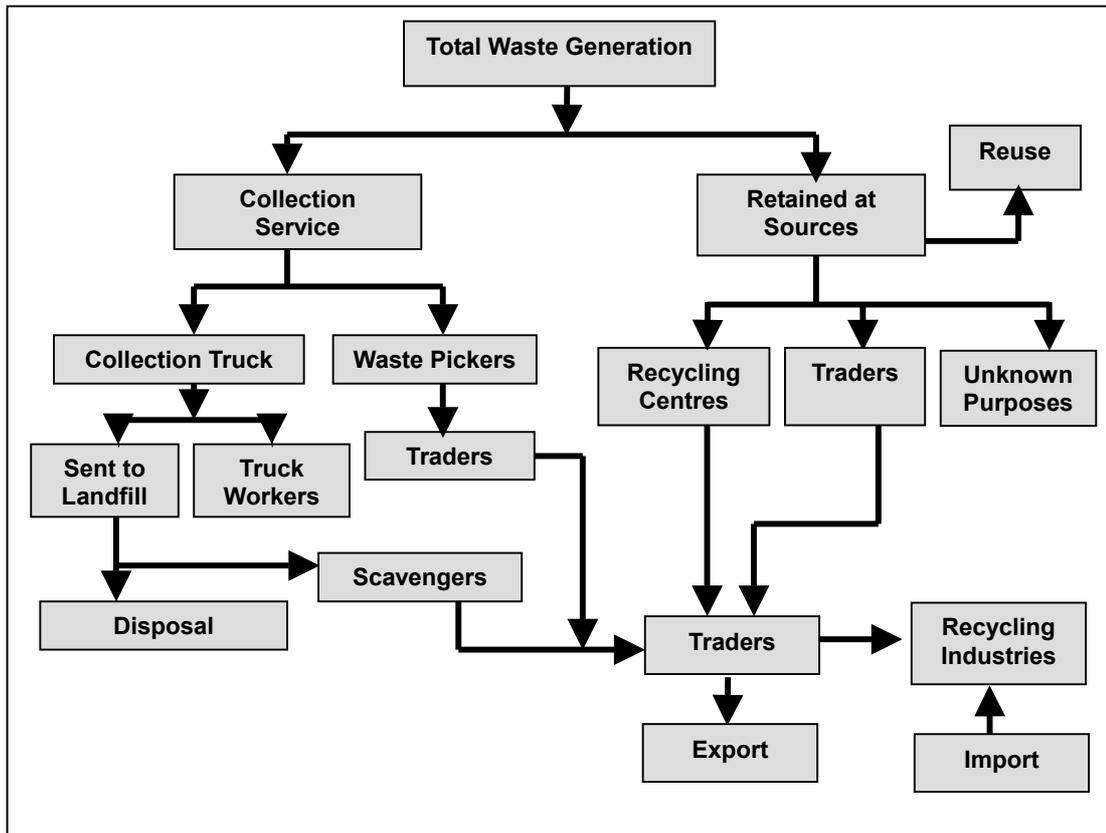


Figure-1 General Waste Flow in Malaysia

In some cases, the above information should be captured not only within the LA boundary but surroundings and/or adjacent large-scale LA.

Appendix 2: Sample Form for Waste Survey

1. Questionnaire form for Collectors
2. Questionnaire form for Collection Centres
3. Questionnaire form for Recyclers
4. Questionnaire form for Traders
5. Questionnaire form for Manufacturers



QUESTIONNAIRE ON MATERIAL FLOW OF RECYCLABLES (Street Collector, Waste Picker at Collection Vehicles, and Scavenger at Landfill)

| | | | |
|-------------|--------------------------------------|--|--|
| Date | | | |
| Interviewer | | | |
| Respondent | Name | | |
| | Position | | |
| | Company/Business Address and Contact | | |

1. Collection and Recovery Field

| | | | |
|-----------------------------|---|---------------------------------|------------------|
| Area of collection | | | |
| Type of Business | <input type="checkbox"/> (a) Door-to-door collector <input type="checkbox"/> (b) Street collector <input type="checkbox"/> (c) Waste collection workers | Years of Operation | |
| | | Working Day | S M T W T F S |
| No. of Colleagues | Only Collectors May Answer Below | | |
| Weekly Sales | RM /week | No. of the waste bins you visit | /day |
| Other Income (if available) | RM /month | No. of the households you visit | /day |

2. Recycling Activities

2.1 Types, Amount and Price of Recyclable Materials

Please specify the types, amount and price of recyclable materials currently collected and the number of sellers of those items in accordance with the table below.

| Type of Recyclables | Amount (kg/week) | Price (RM/kg) | Buyer | |
|---------------------|------------------|---------------|-------|---------|
| | | | Name | Contact |
| Paper | | | | |
| Plastics | | | | |
| Glass | | | | |
| Cardboard | | | | |
| Aluminium | | | | |
| Metals | | | | |
| Scrap computer | | | | |

| Type of Recyclables | Amount (kg/week) | Price (RM/kg) | Buyer | |
|---------------------|---------------------|------------------|-------|---------|
| | | | Name | Contact |
| Others 1: | | | | |
| Others 2: | | | | |
| Others 3: | | | | |
| Others 4: | | | | |
| Others 5: | | | | |

2.2 Problems

What are the problems you face presently when collecting recyclables?

What are the problems you face presently when segregating the recyclables?

What are the problems you face presently when selling recyclables?

This is the end of questionnaire. Thank you for kind cooperation!!



QUESTIONNAIRE ON MATERIAL FLOW OF RECYCLABLES (Recycling Stations and Centres)

| | | |
|-------------|----------|--|
| Date | | |
| Interviewer | | |
| Respondent | Name | |
| | Position | |

1. Company Profile

| | | | |
|-------------------------|--|---------------------|--|
| Name of Organisation | | | |
| Type of Business | | | |
| Year of Incorporation | | Website | |
| Address | | Phone | |
| | | Fax | |
| | | E-mail | |
| Annual Sales (Turnover) | | Number of Employees | |

2. Recycling Activities

2.1 Types, Amount and Price Purchase of Recyclable Materials

Please specify the types, amount and price of recyclable materials currently accepted in your premise and the number of sellers of those items in accordance with the table below.

| Type of Recyclables | Number of Sellers (average per month) | Average Amount (kg/month) | % from collectors/recyclers | % from public | Price (RM/kg) |
|----------------------------|---------------------------------------|---------------------------|-----------------------------|---------------|---------------|
| Aluminium | | | | | |
| Iron | | | | | |
| Plastics | | | | | |
| Paper | | | | | |
| Cardboard | | | | | |
| Glass | | | | | |
| Used electrical appliances | | | | | |
| Used cloth | | | | | |
| Others (specify) | | | | | |
| Others (specify) | | | | | |
| Others (specify) | | | | | |

2.2 Buyer of Recyclables

Please specify the name, location of the major buyers go to your station or centre and the type of recyclables that they buy, in accordance with the table below.

| Type of Recyclables sold to Buyers | Amount (kg/month) | Price (RM/kg) | Name of Buyers |
|------------------------------------|-------------------|---------------|----------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

2.3 Recycling Cost

Please specify the recycling cost at your premise in accordance with the table below.
(Remark: If you do not produce any specific recycled products, but still use recyclable materials at your premise for other purposes, please specify the incremental cost arising from accepting the recyclable materials.)

| Items | Cost (RM/month) |
|--|-----------------|
| 1. Labour cost | |
| 2. Input materials cost | |
| 3. Fuel cost | |
| 4. Utility Cost (Water, Electricity, etc.) | |
| 5. Maintenance/Repair cost | |
| 6. Depreciation of facility/machinery | |
| 7. Others (specify below) | |
| 8. Others (specify below) | |
| 9. Others (specify below) | |
| 10. Others (specify below) | |

2.4 Factors Affecting Recycling Activities

Please choose the three (3) biggest factors affecting the recycling activities at your premise from the options below.

- Difference in price between virgin and recyclable materials
- Quantity of recyclable materials supplied
- Quality of recyclable materials supplied
- Market demand of recycled products
- Awareness of the company in recycling
- Others (Please specify below)

This is the end of questionnaire. Thank you for kind cooperation!!



Ministry of Housing & Local Government, Malaysia,
Japan International Cooperation Agency
The Study on National Waste Minimisation in Malaysia

QUESTIONNAIRE ON MATERIAL FLOW OF RECYCLABLES (Recyclers and Manufacturers who accept recyclables)

| | | |
|-------------|----------|--|
| Date | | |
| Interviewer | | |
| Respondent | Name | |
| | Position | |

1. Company Profile

| | | | |
|-------------------------|--|---------------------|--|
| Name of Company | | | |
| Type of Business | | | |
| Year of Incorporation | | Website | |
| Address | | Phone | |
| | | Fax | |
| | | E-mail | |
| Annual Sales (Turnover) | | Number of Employees | |

2. Recycling Activities

2.1 Types, Amount and Price and Use of Recyclable Materials

Please specify the types, amount and price of recyclable materials currently accepted in your premise in accordance with the table below.

| Type of Recyclables accepted by you | Amount (tonnes/month) | Price (RM/tonnes) | Comparison with Total Materials required in the industry | |
|-------------------------------------|-----------------------|-------------------|--|---------------------------------------|
| | | | % of Recycled materials | Price of virgin materials (RM/tonnes) |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

2.2 Sellers of Recyclables

Please specify the name, location of the major sellers go to your premise and the type of recyclables that they sell, in accordance with the table below.

| Type of Recyclables Bought | Seller name | Contact Information |
|----------------------------|-------------|---------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

2.3 Manufacturing of Recycled Products

If you have any recycled products manufactured in your premise, please specify their types, production amount, selling price and destination of product market in accordance with the table below.

| Type of recycled product manufactured | Monthly Production | | Price of Product (RM) | | Major Destination of Product Market |
|---------------------------------------|--------------------|--------|-----------------------|--------|---|
| | Unit | Amount | Unit | Amount | |
| | | | | | <input type="checkbox"/> Domestic <input type="checkbox"/> Foreign |
| | | | | | <input type="checkbox"/> Domestic <input type="checkbox"/> Foreign |
| | | | | | <input type="checkbox"/> Domestic <input type="checkbox"/> Foreign |
| | | | | | <input type="checkbox"/> Domestic <input type="checkbox"/> Foreign |
| | | | | | <input type="checkbox"/> Domestic <input type="checkbox"/> Foreign |

2.4 Recycling Cost

Please specify the recycling cost at your premise in accordance with the table below.
 (Remark: If you do not produce any specific recycled products, but still use recyclable materials at your premise for other purposes, please specify the incremental cost arising from accepting the recyclable materials.)

| Items | Cost (RM/month) |
|--|-----------------|
| 1. Labour cost | |
| 2. Input materials cost | |
| 3. Fuel cost | |
| 4. Utility Cost (Water, Electricity, etc.) | |
| 5. Maintenance/Repair cost | |
| 6. Depreciation of facility/machinery | |
| 7. Others (specify below) | |
| 8. Others (specify below) | |
| 9. Others (specify below) | |
| 10. Others (specify below) | |

2.5. Factors Affecting Recycling Activities

Please choose the three (3) biggest factors affecting the recycling activities at your premise from the options below.

- Difference in price between virgin and recyclable materials
- Quantity of recyclable materials supplied
- Quality of recyclable materials supplied
- Market demand of recycled products
- Awareness of the company in recycling
- Others (Please specify below)

This is the end of questionnaire. Thank you for kind cooperation!!



QUESTIONNAIRE ON MATERIAL FLOW OF RECYCLABLES (Traders, Middle man and Junk shop who deal recyclables)

| | | |
|-------------|----------|--|
| Date | | |
| Interviewer | | |
| Respondent | Name | |
| | Position | |

1. Company Profile

| | | | |
|-------------------------|--|---------------------|--|
| Name of Company | | | |
| Type of Business | | | |
| Year of Incorporation | | Website | |
| Address | | Phone | |
| | | Fax | |
| | | E-mail | |
| Annual Sales (Turnover) | | Number of Employees | |

2. Recycling Activities

2.1 Types, Amount and Price Purchase of Recyclable Materials

Please specify the types, amount and price of recyclable materials currently accepted in your premise.

| Type of Recyclables | Amount (tonnes/month) | Price (RM/kg) | Source (%) | | | | |
|---------------------|-----------------------|---------------|------------|-----------|--------|-----------|--------|
| | | | Own | R. Centre | Trader | Collector | Public |
| Aluminium | | | | | | | |
| Iron | | | | | | | |
| Plastics | | | | | | | |
| Paper | | | | | | | |
| Cardboard | | | | | | | |
| Glass | | | | | | | |
| Others 1: | | | | | | | |
| Others 2: | | | | | | | |
| Others 3 | | | | | | | |

2.2 Buyer of Recyclables

Please specify the name, location of the major buyers go to your premise and the type of recyclables that they buy, in accordance with the table below. *(if more than 1 buyer per recyclable item, list out by buyer name, amount sold and price)*

| Type of Recyclables | Amount (kg/month) | Price (RM) | Name and location of buyers |
|-------------------------|-------------------|------------|-----------------------------|
| Aluminium | | | |
| Iron/Metals/Cans | | | |
| Plastics | | | |
| Paper | | | |
| Cardboard | | | |
| Glass | | | |
| Others (Please Specify) | | | |
| Others (Please Specify) | | | |

2.3 Recycling Cost

Please specify the recycling cost at your premise in accordance with the table below.
(Remark: If you do not produce any specific recycled products, but still use recyclable materials at your premise for other purposes, please specify the incremental cost arising from accepting the recyclable materials.)

| Items | Cost (RM/month) |
|--|-----------------|
| 1. Labour cost | |
| 2. Input materials cost | |
| 3. Fuel cost | |
| 4. Utility Cost (Water, Electricity, etc.) | |
| 5. Maintenance/Repair cost | |
| 6. Depreciation of facility/machinery | |
| 7. Others (please specify) | |

2.5. Factors Affecting Recycling Activities

Please choose the three (3) biggest factors affecting the recycling activities at your premise from the options below.

- Difference in price between virgin and recyclable materials
- Quantity of recyclable materials supplied
- Quality of recyclable materials supplied
- Market demand of recycled products
- Awareness of the company in recycling
- Others (Please specify below)

This is the end of questionnaire. Thank you for kind cooperation!!



QUESTIONNAIRE ON BUSINESS ENTITIES (MANUFACTURING FACTORY)

| | | |
|-------------|----------|--|
| Date | | |
| Interviewer | | |
| Respondent | Name | |
| | Position | |

1. COMPANY PROFILE

| | | | |
|-------------------------|--|---------------------|--|
| Name of Company | | | |
| Type of Business | | | |
| Year of Incorporation | | Website | |
| | | Phone | |
| Office Address | | Fax | |
| | | E-mail | |
| | | Number of Employees | |
| Annual Sales (Turnover) | | | |
| Annual Report Provided? | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |

2. BASELINE DATA OF THE FACTORY

2.1 Types and amount of production output

Please specify the types and amount of production output in your factory.

| | Types of Products | Production Output (per month) | |
|---|-------------------|-------------------------------|--------|
| | | Unit | Amount |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

2.2 Types and amount of raw materials used

Please specify the types and amount of raw and processed materials input in your factory

| | Type | Usage/Purpose | Amount (Tonnes/month) |
|---|------|---------------|-----------------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

2.3 Water consumption

Please specify the amount of water consumed in your factory by following purposes.

| Purpose | | Water consumption (m ³ /month) | Cost of Water Consumption (RM/month) |
|---------|--------------------------------|---|--------------------------------------|
| 1 | Industrial Use (Process Water) | | |
| 2 | Others | | |

2.4 Energy consumption

Please specify the types and amount of energy resources used in your factory.

| | Type | Monthly Consumption | |
|---|---|---------------------|--------|
| | | Unit | Amount |
| 1 | Electricity | | |
| 2 | Solid fuels (Coal, Coke, Peat, etc.) | | |
| 3 | Liquid fuels (Oil and other petroleum products) | | |
| 4 | Gaseous fuels (Natural Gas, LPG, etc) | | |
| 5 | Biomass (wood, charcoal, etc.) | | |
| 6 | Others (please specify _____) | | |
| 7 | Others (please specify _____) | | |
| 8 | Others (please specify _____) | | |

2.5 Production Process Flow Chart

Production process flow chart provided? Yes No

3. BASELINE DATA OF WASTE GENERATION

3.1 Types and amount of waste generated from production process

Please specify the types and amount of waste generated from your production process.

| | Type | Generation Source in the Process | Generation (per month) | |
|-------------------------------|------------------------|----------------------------------|------------------------|--------|
| | | | Unit | Amount |
| 1. Non-Scheduled Waste | | | | |
| 1 | Waste paper | | | |
| 2 | Waste wood | | | |
| 3 | Waste fibres | | | |
| 4 | Waste rubber | | | |
| 5 | Waste plastic | | | |
| 6 | Animal/Plant waste | | | |
| 7 | Scrapped metals | | | |
| 8 | Scrapped glass | | | |
| 9 | Scrapped ceramics | | | |
| 10 | Slag | | | |
| 11 | Ash | | | |
| 12 | Sludge | | | |
| 13 | Others (Specify _____) | | | |

3.2 Types & amount of non-scheduled waste generated from non-process sources

Please specify the types and amount of waste generated from non-process sources in your factory.

| Type | | Generation (per month) | |
|------|------------------------------|------------------------|--------|
| | | Unit | Amount |
| 1 | Waste papers | kg | |
| 2 | Steel cans | kg | |
| 3 | Aluminum cans | kg | |
| 4 | PET bottles | kg | |
| 5 | Glass bottles | kg | |
| 6 | Kitchen waste | kg | |
| 7 | Other Wastes (specify _____) | | |
| 8 | Other Wastes (specify _____) | | |
| 9 | Other Wastes (specify _____) | | |
| 10 | Other Wastes (specify _____) | | |
| 11 | Other Wastes (specify _____) | | |
| 12 | Other Wastes (specify _____) | | |
| 13 | Other Wastes (specify _____) | | |

3.3 Efforts of Waste Minimisation at Source

What kinds of efforts are currently made in your factory for waste minimization at the source?

Please all those apply.

| | | |
|---|--|--|
| a | Measurement and recording of raw material input and water/energy consumption in the production/manufacturing process. | |
| b | Measurement and recording of the amount of waste generated from production/manufacturing process. | |
| c | On-site reuse/recycling of waste | |
| d | Segregation of waste between recyclables and non-recyclables | |
| e | Production process control to maximize productivity (water/energy/raw material saving, minimization of defective products, etc.) | |
| f | Others (Please specify) | |

4.2 Use of Recycled Materials in the Factory

Do you currently accept any recycled materials for use in your factory? If you do, please specify them in accordance with the table below.

| Type | Amount (per month) | | Supply | | Price (RM/kg) | Use/Purpose |
|------|--------------------|--|--------------------|---|---------------|--|
| | Unit | | from | % | | |
| | | | 1. Collectors | | | <input type="checkbox"/> Raw Materials <input type="checkbox"/> Energy use (as fuel) <input type="checkbox"/> Others (Specify) |
| | | | 2. Other factories | | | |
| | | | 3. Import | | | |
| | | | 4. Others | | | |
| | | | 1. Collectors | | | <input type="checkbox"/> Raw Materials <input type="checkbox"/> Energy use (as fuel) <input type="checkbox"/> Others (Specify) |
| | | | 2. Other factories | | | |
| | | | 3. Import | | | |
| | | | 4. Others | | | |
| | | | 1. Collectors | | | <input type="checkbox"/> Raw Materials <input type="checkbox"/> Energy use (as fuel) <input type="checkbox"/> Others (Specify) |
| | | | 2. Other factories | | | |
| | | | 3. Import | | | |
| | | | 4. Others | | | |
| | | | 1. Collectors | | | <input type="checkbox"/> Raw Materials <input type="checkbox"/> Energy use (as fuel) <input type="checkbox"/> Others (Specify) |
| | | | 2. Other factories | | | |
| | | | 3. Import | | | |
| | | | 4. Others | | | |
| | | | 1. Collectors | | | <input type="checkbox"/> Raw Materials <input type="checkbox"/> Energy use (as fuel) <input type="checkbox"/> Others (Specify) |
| | | | 2. Other factories | | | |
| | | | 3. Import | | | |
| | | | 4. Others | | | |

4.3. Future use of Recycled Material

What other future / potential recycled materials to be used in your factory? Please specify.

4.4 Issues on Waste Management and Recycling

Please describe the issues your factory is currently facing in relation to waste management and recycling.

This is the end of questionnaire. Thank you for your kind cooperation

Appendix 3: Sample Form for Awareness Survey

PUBLIC AWARENESS & PARTICIPATION IN SOURCE SEPARATION

(On an individual basis and NOT as representative of your organisation)

Date: _____

I. BASIC DESCRIPTION OF RESPONDENT

1.1 Name (Optional)

1.2 Address :

1.3 Contact (Optional)

1.4 Gender: Male Female

1.5 Race: Please tick ✓ the correct answer

Malay Chinese Indian Others (Please specify)

1.6 Religion: Please tick ✓ the correct answer

Islam Buddhism Christianity Hinduism Others

1.7 Age Group:

≤17 18~22 23~35 36~45 46~55 56~65 More than 65

1.8 Type of Employment:

Government Private Company School/Learning Institution Students

Others (Housewife, retiree, etc.)

1.9 Academic qualifications: Please tick ✓ the correct answer. .

- | | |
|---|---|
| a. No schooling <input type="checkbox"/> | d. University Graduate <input type="checkbox"/> |
| b. Primary School <input type="checkbox"/> | e. Post Graduate <input type="checkbox"/> |
| c. Secondary School <input type="checkbox"/> | f. Others (Please specify) |
| d. Diploma/Certificate <input type="checkbox"/> | g. Others (Please specify) |

.....

1.10 How many people live in your household?

1-2 persons 3-5 persons 6-10 persons >10 persons

1.11 What type of home do you currently reside in?

- | | |
|---|--|
| Terraced house <input type="checkbox"/> | Semidetached house <input type="checkbox"/> |
| Detached house <input type="checkbox"/> | Highrise (Apartment/ Condominium) <input type="checkbox"/> |
| Shophouse <input type="checkbox"/> | Commercial units <input type="checkbox"/> |

1.12 Who normally takes the garbage out in your family?

- Husband Wife Children Maid Self (single person)
Others (Relatives, friends, housemates)

2. AWARENESS ON 3R ACTIVITIES

2.1 Do you think 3R activities (i.e. reduce, reuse, recycle) are necessary? Yes No

If yes, please provide your reason (you may select more than one):

To save our natural resources

To prevent pollution

To keep our environment clean

To save cost For commercial purpose

Other reason Pls. Specify

2.2 Do you have following knowledge on 3Rs?

Please rate the level of your knowledge (tick only one applicable answer for each statement)

| No | Questions: Do you know.....? | No Idea | Not Sure | Know | Know Very Well |
|----|--|---------|----------|------|----------------|
| 1 | What Item can be recycled? | | | | |
| 2 | Who collects the recyclables? | | | | |
| 3 | Where the recyclables are sent? | | | | |
| 4 | How the recyclables are treated? | | | | |
| 5 | Ideas for reducing/reusing/recycling wastes? | | | | |

Notes: Please select
 4: when you know very well, and have some information to prove it
 3: when you know
 2: when you know, or have heard of it, but not so sure.
 1: when you have no idea

2.3 Do you participate in any activities on 3Rs?

| | No | Activities | Currently practice 1 = YES 2 = NO | If "NO" state reason 1 = No time 2 = Not interested 3 = Need more info | Future Plan 1 = Continue current practice 2 = Participate from now 3 = No plan to participate |
|---------|----|---|---|---|--|
| Reduce | 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 | | | |
| Reuse | 6 | Wash and reuse bottles, cans & bins | | | |
| | 7 | Reuse half-used papers | | | |
| Recycle | 8 | Practice waste separation at home / office for recycling | | | |
| | 9 | Send / sell recyclable items to recycling centers | | | |
| | 10 | Sell / give recyclable items to collectors | | | |
| | 11 | Buy from second hand / recycling shops | | | |
| | 12 | Volunteer at recycling organization | | | |
| Others | 13 | Compost yard and garden wastes, etc. | | | |
| | 14 | Others (specify _____) | | | |
| | 15 | Others (specify _____) | | | |
| | 16 | Others (specify _____) | | | |

Notes: "Buy wisely" includes following: buy long lasting things, buy things with less packaging, buy foods in reusable or easier-to-recycle containers, buy refillable things, buy things do not contain harmful substances, and buy environmental friendly items, etc.

3. SOURCE SEPARATION ACTIVITY

3.1 How is source separation carried out at your place?

Please provide the type of wastes separated and collected methods:

| No | Activities | YES | | | | NO |
|----|------------------------------------|--------------|-------------------|-------------------|--------|----|
| | | Door to door | Collection points | Recycling centres | Others | |
| 1 | Food wastes | | | | | |
| 2 | Old newspapers | | | | | |
| 3 | Cardboards | | | | | |
| 4 | Books / Magazines | | | | | |
| 5 | Plastic bottles | | | | | |
| 6 | Glass | | | | | |
| 7 | Metal cans | | | | | |
| 8 | Aluminium cans | | | | | |
| 9 | Used Furniture | | | | | |
| 10 | Old Clothes | | | | | |
| 11 | Used batteries / fluorescent tubes | | | | | |
| 12 | Others (_____) | | | | | |

3.2 Do you have any problem with the separation/ collection methods of recyclables?

Yes No

If yes, please explain why:

Separation method is not suitable bins/ bags are not suitable

Frequency and time of collection frequency is not suitable

Pls. provide brief explanation:

3.3 What is your preferred collection frequency for recyclables?

Once a week Once in 2 weeks Once a month

3.4 What is your preferred day and time of collection?

Specify (day)..... (time).....

3.5 Would you like to have a drop-off point in your neighbourhood / area?

Yes No

4. ADDITIONAL COMMENTS & SUGGESTIONS ON RECYCLING

.....
.....
.....
.....

5. PLEASE INDICATE HOW YOU CAN CONTRIBUTE MORE TOWARDS THE RECYCLING ACTIVITIES

.....
.....
.....
.....

Explanatory Notes:

1. Definitions:

- a) 3R ACTIVITY: Refers to the three activities, i.e., reduction, reuse, recycling.
- b) WASTE REDUCTION: To reduce the amount of waste that will be put into waste stream through the changes of lifestyle and/or manner of consumption, and so on.
- c) SOURCE SEPARATION: To separate recyclables from other wastes at home/ office/ any other places where wastes are generated.
- d) RECYCLING: To utilize a waste for other purposes.

Appendix 4: Case Study

1. Summary of Features of SS Systems in Three Pilot Projects¹ (2005)
2. Case Study1<Source Separation at Residential Area in MP Pulau Pinang>
3. Case Study2<Source Separation at Residential Area in MP Subang Jaya >
4. Case Study3<Source Separation at Residential Area in MB Miri >
5. Case Study4 <Source Separation at Institution in MP Subang Jaya>

¹ Pilot Projects II-Component 2, Study on National Waste Minimisation, 2004-2006

1. Summary of Features of SS Systems in Three Pilot Projects² (2005)

| Target Groups | LA | Target Recyclables | Recyclable Storage/ | Method of Collection | Recyclable Collector | Collection Frequency | Incentive |
|---|------------------------|--|--|-----------------------------|--|----------------------------|--|
| Households (Bungalows/ Terrace houses) | MPPP (case study 1) | Paper Plastics Metals Glass & e-waste | 1 HDPE bin for recyclables only/house (recyclables in separate plastic bags in same bin) | Door-to-door (Kerbside) | Private contractor | Once/week | Household (Nil) |
| | MBM (case study 3) | Paper Plastics Metals Glass | 1 plastic bag & boxes for paper | Door-to-door & station | NGO LA (SWM crew) | Once/ 2 weeks Once/week | Household (Nil) |
| Households (Apartments) | MPSJ (case study 2) | Paper Plastics Metals Glass | 3 plastic bags & containers | Station | Private contractor | Once/week | Household (Returns from sale) |
| | MPSJ (case study 4) | Paper | 3 recycling bins | Station | Concessionaire (Alam Flora Sdn Bhd) | Once/week | MPSJ/AFSB (Returns from sale) |
| Shopping Complex (South City Plaza) | MPSJ | Paper Plastics Metals Glass | Buy-back (Cabin) Centre | Station | Concessionaire (Alam Flora Sdn Bhd) | Daily | Individuals/AFSB (Returns from sale) |
| | MBM | | Bags/boxes Recycling bins | Room-to-roo m Station | Housekeeping Private contractor | Once/month | Guests (Nil) Hotel (Returns from sale) |

² Pilot Projects II-Component 2, Study on National Waste Minimisation in Malaysia, 2004-2006

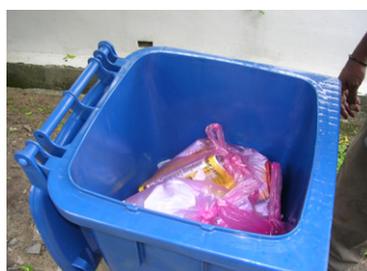
2. Case Study 1 <Source Separation at Residential Area in MP Pulau Pinang>

1) Source Separation System Introduced in MPPP

| | |
|---|--|
| 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 | <ul style="list-style-type: none"> • 3 times per week for organic waste by existing waste collector • Once a week for recyclable items by an appointed recycling agent. |
| Segregation method | 2 Items 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. |
| Equipments for source separation | <ul style="list-style-type: none"> • Organic waste : Green bins distributed by MPPP in early time • Recyclables :HDPE blue coloured bins with waterproof stickers (distributed under this project) • No plastic bag was provided to the participating households. |
| Collector | 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



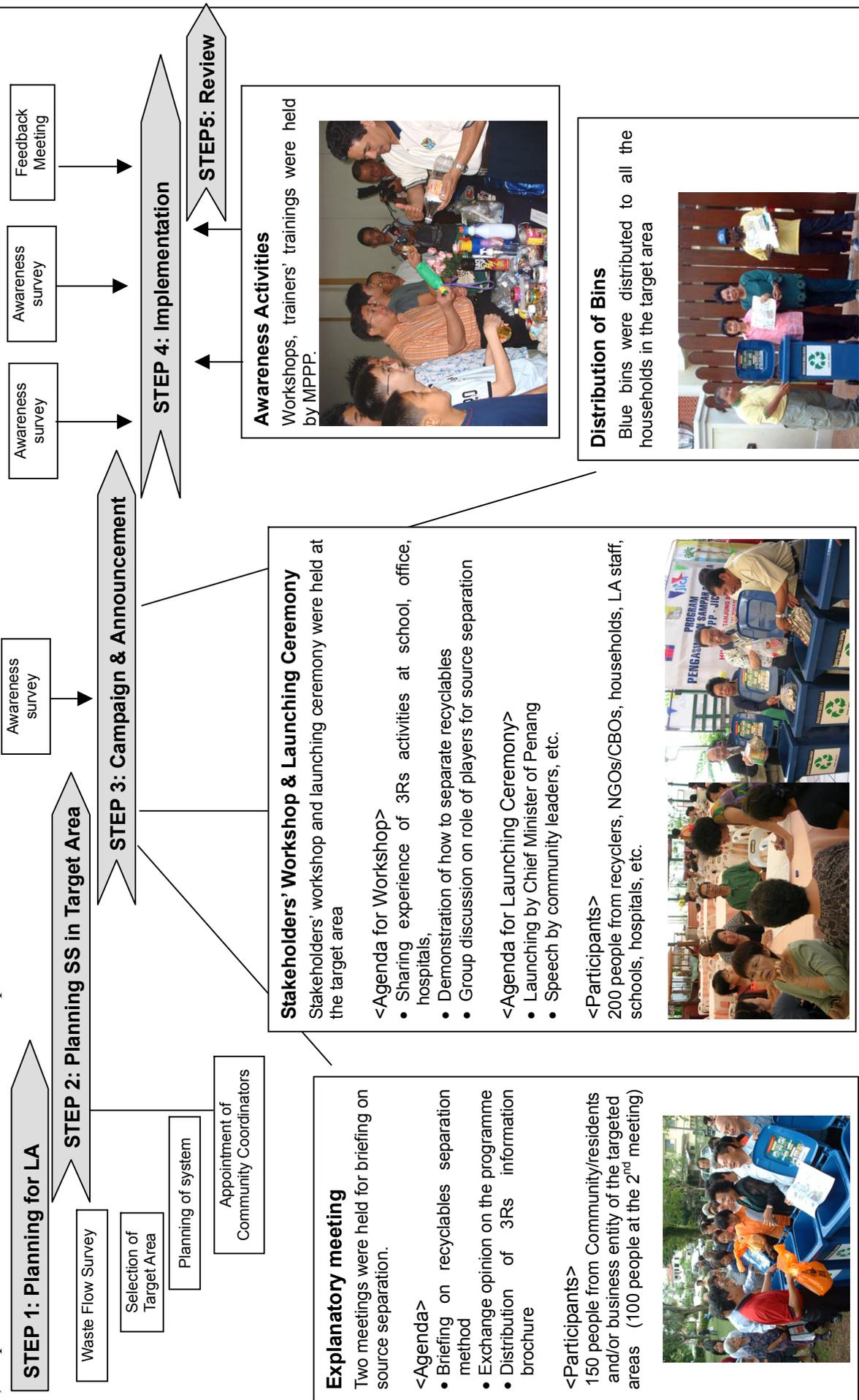
Bring bins to the front of the gate on collection day



Appointed collector collects recyclables from blue bins



2) Implementation Procedure for Source Separation



3) Information Materials Published in MPPP

Information materials for the awareness rising were published in various forms and distributed to the stakeholders in MPPP.

a. Stakeholders' Directory (Example of list of stakeholders)

PENANG ISLAND RECYCLING DIRECTORY

A Directory of Agents, Buyers &
Recycling Communities,
in Penang





September 2005

PLASTIC

| | |
|--|---|
| <p>Angle Frontier Sdn Bhd 32 Lorong Seruling 5 Kawasan Perusahaan Valdor 14200 Sungai Bakap Seberang Perai Selatan Pulau Pinang Tel : 04-582 7934 H/P : 012-492 6373 Email : anglefrontier@yahoo.com</p> <p>BeautyPlas Industries 12A Lorong Teguh 1 Taman Industri Teguh Permatang Tinggi, 14000 Bukit Mertajam Tel : 04-588 6168 Fax : 04-588 6194</p> <p>Domic Industries Sdn Bhd 3677 Mk 9, Kampung Besar Berapit, 14000 Bukit Mertajam Tel : 04-539 9943 Fax : 04-530 4169 H/P : 019-445 0731 Email : limah@pc.jaring.my Contact : Mr. Lim Ah Huat</p> <p>EverLantern Trading Sdn Bhd LBS 298 Jalan Kuala Ketil 08000 Sungai Petani, Kedah Tel : 04-423 6689 H/P : 019-474 6899 Contact : Mr. Aw Chee Yee</p> | <p>Plasticycle Industries S/B Plot 12 Kulim Ind. Est 09000 Kulim Tel : 04-489 2420 Fax : 04-489 2414 H/P : 012-480 9689 Email : wbung@tm.net.my Contact : Mr. Tan Khoon Chuah</p> <p>Sunnyjaya Industries Sdn Bhd Plot 72, Lorong Perindustrian Bukit Minyak 14 Kaw. Perindustrian Bukit Minyak 14100 Seberang Perai Tel : 04-507 3597 / 04-507 3604 Fax : 04-507 3594 Email : sunnypsb@tm.net.my / sunnypsb@yahoo.com Contact : Mr Ong Tang Ngo</p> <p>Tri Emmanuel Sdn Bhd 287 Block H, Mk 12 Jalan Batu Maung 11960 Pulau Pinang Tel : 04-626 3550 / 1855 Fax : 04-626 4009 H/P : 012-469 9768 Contact : Mr. Sam Tan</p> <p>YB Enterprise Sdn Bhd Plot 98 & 99 Jalan Aman 2/2, Kaw Industri Taman Makmur 09600 Lunas, Kedah Tel : 04-484 5257/87 Fax : 04-484 2288 H/P : 012-402 7727 Email : yap@ybgroup.com Contact : Mr. Yap Khoon Fatt</p> |
|--|---|

b. Leaflet with instructions on how to prepare recyclables.

Leaflet was published in 3 languages, i.e., English, Chinese and Malay.

KERTAS

- Ikat dengan kemas
- Simpan kertas corak ke dalam beg plastik untuk dikitar semula



BEKAS MINUMAN PLASTIK

- Buka penutup
- Kosongkan bekas
- Cuci
- Mampatkan dan simpan untuk dikitar semula



LAIN-LAIN BEKAS PLASTIK

- Kosongkan bekas
- Cuci
- Simpan untuk dikitar semula



BEKAS MINUMAN ALUMINIUM

- Kosongkan bekas
- Cuci
- Keringkan
- Mampatkan dan simpan untuk dikitar semula



LAIN-LAIN BEKAS LOGAM

- Kosongkan bekas
- Cuci
- Simpan untuk dikitar semula



KACA

- Kosongkan bekas
- Cuci
- Simpan untuk dikitar semula





c. Website for 3Rs in MPPP

3. Case Study 2 <Source Separation at Residential Area in MPSJ>

1) Source Separation System Introduced in Apartments in MPSJ

MPSJ introduced station collection to an apartment.

| | |
|---|---|
| Method tested | Station collection |
| Target Items | Paper, Plastics, Metals |
| Collection Frequency | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Large Recycling Bins (4 bins are placed within condominium premises) for recyclables (newly introduced) • Store room (1 /block) for non recyclables |
| Segregation method | <p>4 Separation: Organic waste, Used papers (News papers, black & white papers, magazines), Plastics (bottle, packaging, etc.), Metals (aluminium cans, ferrous cans, etc.)</p> <p>Residents separate recyclables from wastes and put those in plastic bags, then discharge the recyclables into recycling bin. Appointed recycling agent come to the Condo to collect recyclables.</p> |
| 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.

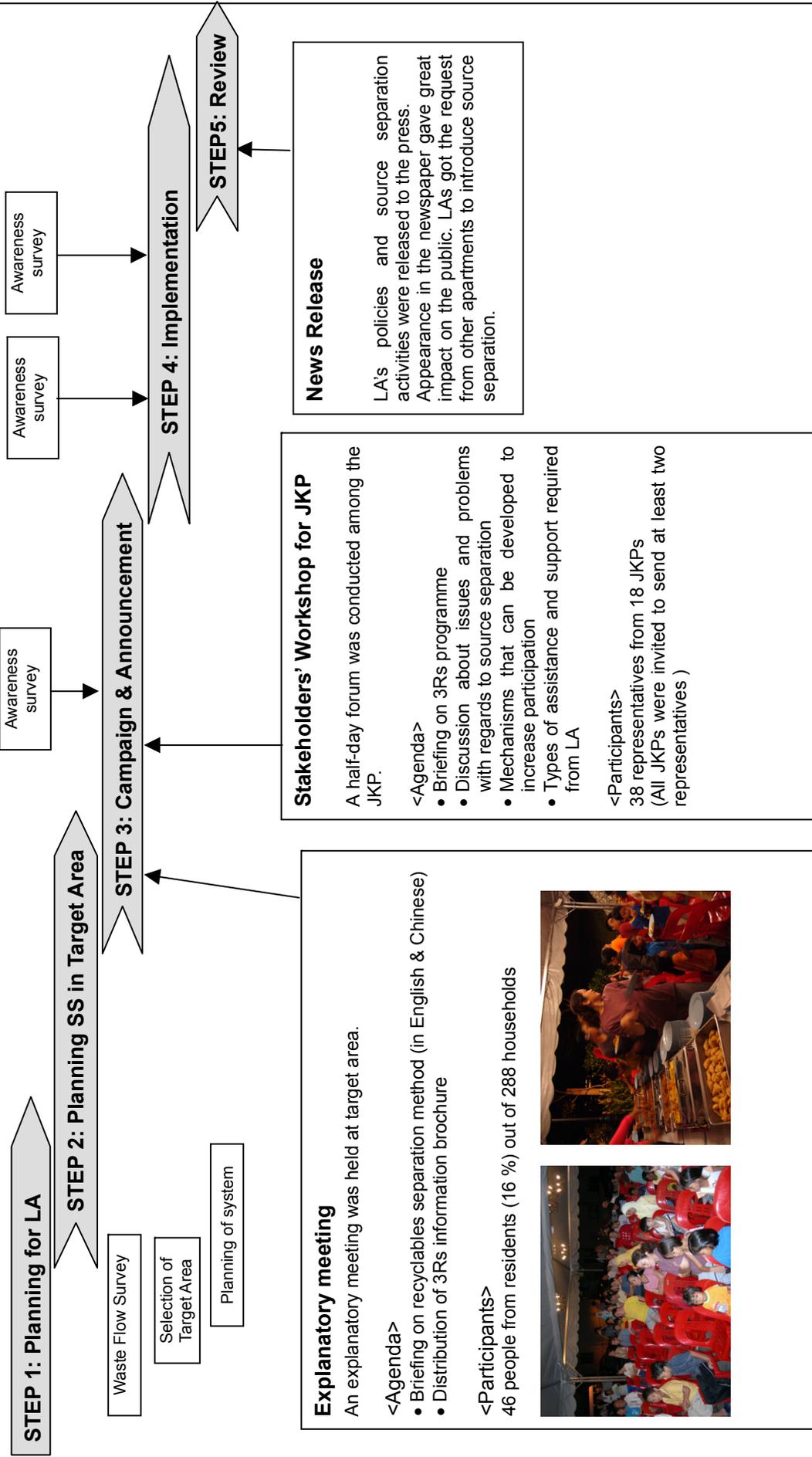


Signboard at the Apartment



Collection service by appointed recycling agent

2) Implementation Procedure for Source Separation



3) Information Materials Published in MPSJ

a. 3Rs brochure for Apartment

Brochure was prepared in 3 languages, i.e., English, Chinese and Malay.

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
c/o Majlis Perbandaran Subang Jaya
Persiaran Perpaduan, Jalan USJ 5
47610 Subang Jaya

Tel: 03-8025 1749
Fax: 03-8023 7673

*Kindly contact us for queries
or other information*



SOURCE SEPARATION PROJECT

DE PALMA Condominium






JICA STUDY TEAM

EXPLANATORY MEETING
Thursday 18 August

DE PALMA PROJECT

Objectives of the project

To establish a sustainable recycling system in De Palma condominium.

To introduce source separation of recyclable materials at the household level.

Scope of the project

- Waste stream assessment
- Source separation
- Survey

Your assistance is the key element to the success of this project !!

Thank you in advance for your participation

Requirements from Household

1 Source Separation :
Pilot project:

- Duration of Pilot Project: 8 weeks.
- 3 colored bags supplied per household weekly each bag for one type of recyclable materials*.
- Special bins will be placed at 4 strategic locations to discharge the recyclable materials.
- Non recyclable waste such as food and other organic waste to be disposed as usual.

Long term project

- After the pilot project, households should continue the source separation activity by disposing recycling materials in the special recycling bins

2 Public awareness survey:

- A survey questionnaire will be distributed to each household before, during and after the Pilot Project.
- The purpose is to analyze the waste stream and public awareness on recycling activities taking place in De Palma.

* Recyclable materials are separated in 3 different bags to facilitate the waste stream assessment.

PROJECT



PAPER
BAG #1



PLASTICS (bottle, packaging ...)
BAG #2



Metals (Aluminum, ferrous ...)
BAG #3



NON RECYCLABLE WASTE (waste food, contaminated waste ...)
USUAL BIN

AS USUAL NO CHANGE

b. Stakeholders' Directory

Stakeholders are listed by types of items they handle. Explanation on what kind of items can be accepted by them is also mentioned in the directory.

Plastics

All coloured and non-coloured plastics like shopping bags, supermarket bags, drink plastic bottles, mineral water bottles, food containers, detergent bottles and vitamin containers, **EXCEPT** paint containers, toxic containers, laboratory apparatus and Styrofoam.

| Companies that will come and collect your recyclable plastics | Telephone |
|---|---------------------------|
| FZ Intan Plastic Sdn Bhd | 012-2949554 / 012-3108152 |
| Indahirah Enterprise | 03-51633554 |
| JBSN Enterprise | 012-3186205 / 016-2317652 |
| Pau Mah Plastic Industries Sdn Bhd | 03-80622268 |
| Persatuan Kebajikan Xin Phou Moon | 03-89623745 / 03-89623746 |
| Pertubuhan Amal Seri Sinar (NPO) | 03-42977022 |
| Perusahaan Beta Sdn Bhd | 03-80624718 |
| Positive Recycle Industries | 03-80684439 |
| Preserve-IT Industries Sdn Bhd | 03-51618177 |
| Saniplus Marketing | 03-51227098 |
| Seng Hiap Metal Sdn Bhd | 03-51223402 |
| Truemax (M) Sdn Bhd | 03-80231304 |
| Upper Matrix Depot Sdn Bhd | 03-51210882 |











**MAJLIS PERBANDARAN SUBANG JAYA
RECYCLING DIRECTORY**

A Directory of Agents, Buyers & Recycling Communities in MPSJ







October 2015






4. Case Study 3 <Source Separation at Residential Area in MB Miri >

1) Source Separation System Introduced in MBM

| | | |
|---|--|---|
| Collection Method | Door to door collection and station collection | |
| Target Items | Paper, Plastics, Metals, PET bottles | |
| Collector * | NGO(Buddhist Tzu Chi) and MCC (collect by turns) | Garbage contractor appointed by City Council “Piggy Back” on normal rubbish route |
| Collection Frequency * | <Door to door collection> <ul style="list-style-type: none"> • 3 times per week for organic waste by garbage contractor • Every 2 weeks (Sunday morning from 8am until 11am) | <Door to door collection> <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | |

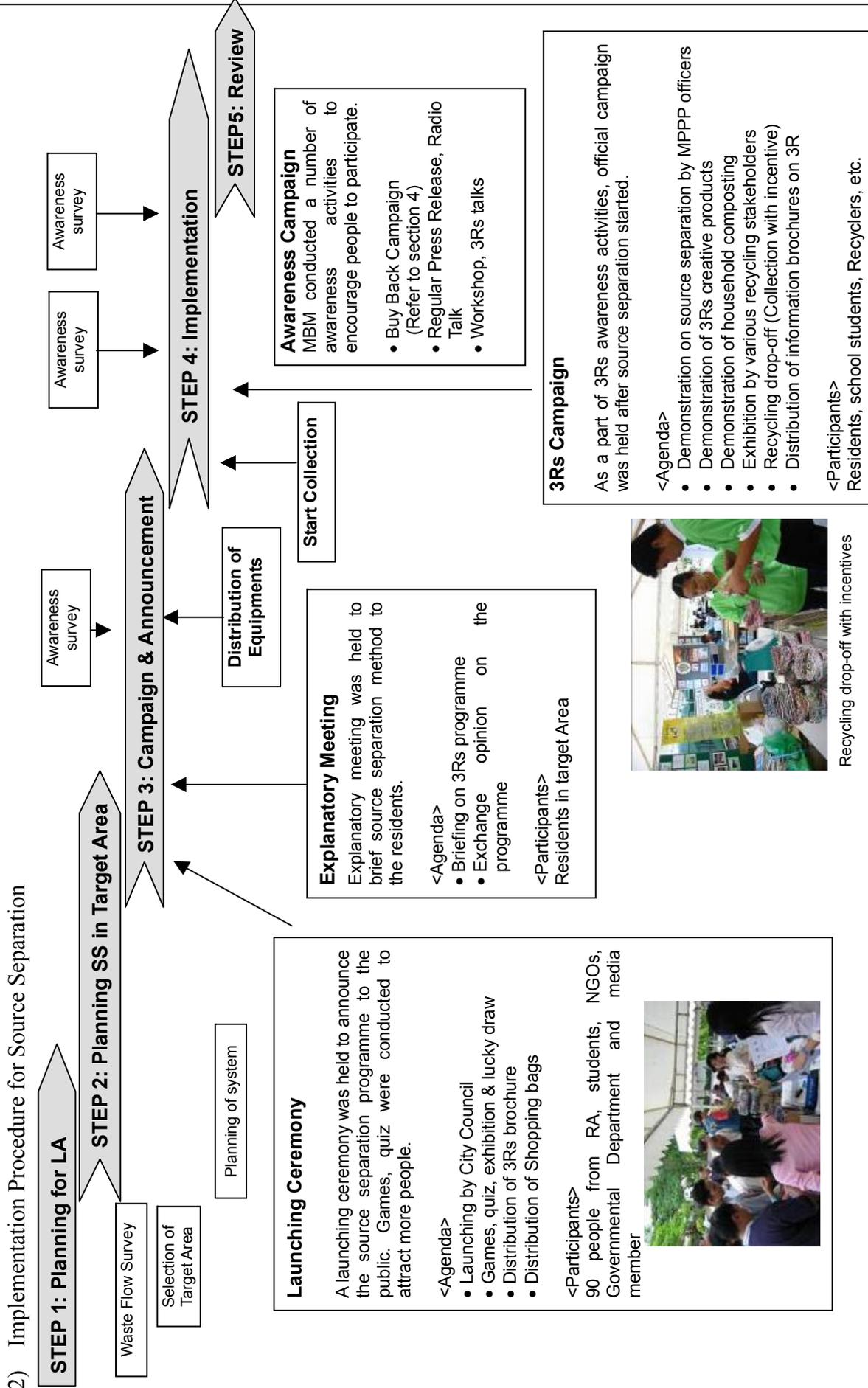
* MBM implemented 2 types of collection system.



Plastic bag and boxes were distributed. Residents were asked to put recyclables into those, and pass to collector on the collection day.



Collection by NGO (left), Las (middle) and garbage contractor (right)

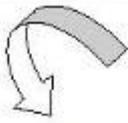


3) Information Material Published by MBM

a. Example of Information Leaflet: How to Handle the Recyclable Items?

Instruction sheets on how to handle the recyclable items were prepared and distributed to the residents together with collection bags and boxes.

How to handle the recyclable items? 怎样处理回收物品?



Paper Product 纸张



Recycling Box for paper product
回收纸盒



Black and white paper 黑白纸



Mixed Paper (Phone Book, Text Book, Magazines etc.), 杂纸 (电话簿, 书本, 杂志等等)

Aluminium Cans/ Plastic Product/ Glass Bottles 铝罐/塑胶/玻璃瓶

Empty content, rinse before entering the green bag. 清洗干净, 然后放进青色塑胶袋







PET Bottle
Plastic Bottles 透明瓶



Aluminium cans 铝罐



Glass bottles 玻璃瓶

Plastic bags is for plastic product, glass and aluminium cans 透明瓶, 铝罐, 和玻璃瓶装进塑胶纸袋

Newspaper/ Old Corrugated Cardboard 旧报纸/旧盒子



Old Newspaper 旧报纸



Old Corrugated Cardboard 旧盒子

Tie up neatly 整齐的绑起来

Collection of the recyclables will be carried out every Saturday from 7am to 10am. Please kindly place your recyclable items beside your normal bins and do not mix the recyclables with the garbage.

b. Collection Schedule

Since collection service was provided fortnightly in target area, collection schedule was prepared and distributed to the public to avoid confusion.

Tentative date for recyclables collection

Door-to-door collection (Krokop 10 & Tadika Road)

Collection frequency – fortnightly (two week)

Collector - MCC and Buddhist Tzu-Chi Association

All collection will be donated to Buddhist Tzu-Chi Association

The tentative date for collection as shown below

回收时间表

上门收集边(珠芭十号路与幼稚园路)

- 收集次数 – 每两个星期
- 收集单位 – 美里市政局和慈济功德会
- 全部收集品将捐献给慈济功德会
- 收集时间如下:

| SEPTEMBER 九月 | | | | | | |
|--------------|-----|-----|-----|-------|-----|-----|
| Sun | Mon | Tue | Wed | Thurs | Fri | Sat |
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

| OCTOBER 十月 | | | | | | |
|------------|-----|-----|-----|-------|-----|-----|
| Sun | Mon | Tue | Wed | Thurs | Fri | Sat |
| 30 | 31 | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |

| NOVEMBER 十一月 | | | | | | |
|--------------|-----|-----|-----|-------|-----|-----|
| Sun | Mon | Tue | Wed | Thurs | Fri | Sat |
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

Miri City Council (MCC) 美里市政局

Buddhist Tzu-Chi Association 慈济功德会

Collection Centre (Krokop 5 & Bulatan Park)

Open on every Sunday from 9.00am until 11.00am

回收中心(珠芭五号路及 慈济人造湖公园) 对外开放

收集时间若有任何更改, 将以报纸通知

Please refer to press release if have any changes of the collection date

4) Incentive Campaign

As a part of 3Rs campaign, MBM organised buyback campaign with car parking coupons as an incentive, which turned out to be successful.

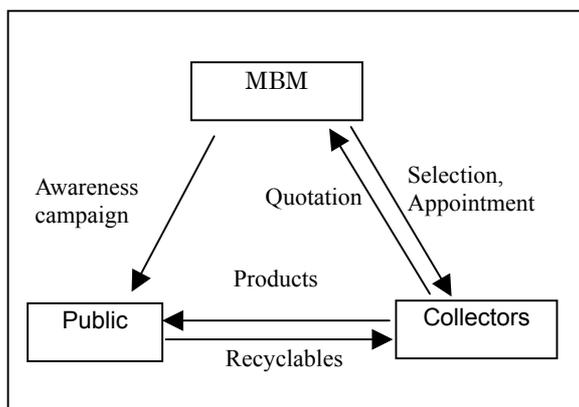
Car parking coupon was distributed based on the equivalent “buy-back” price set by recycling collectors. The response to this campaign was overwhelming, attracted 387 participants that exchange recyclables with 1000 books of car parking coupon. Around 30 metric tonnes of recyclable items were collected in that day which is around 10% of average total recyclables (including commercial and industrial) collected in Miri with one day of campaign.



3R Campaign with daily use product as an incentive had also been organised at Market. Daily use product was distributed based on the equivalent “buy-back” price that set on the quotation from collectors.

Overall, 135 participants had exchanged their recyclable items with incentives (40 bag 5kg rice, 10 bag 10 kg rice, 504 tins soft drink, 92 bottles drinking water which total valued RM 1304). This campaign was held from 3 p.m. to 6 p.m. Around 9 tonnes of recyclable items were collected in those 3 hours.

Implementation Framework for Buyback Campaign



Example of "Buy-Back" price during

| Items | | RM / kg |
|---------------------------|---------------------------------|----------|
| Papers | Old Newspaper | 0.10 |
| | Old Corrugated Cardboard | 0.05 |
| | Black & White Paper | 0.20 |
| | Mix Paper (magazine / old book) | 0.10 |
| | Computer paper | 0.30 |
| Aluminium Can | | 3.00 |
| Tin Can (Metal) | | 0.20 |
| Plastics | | 0.30 |
| | | RM / pcs |
| Glasses (Alcohol Bottles) | Small bottle | 0.05 |
| | Big Bottle (clear) | 0.20 |
| | Big Bottle (Green & Brown) | 0.15 |
| | Other alcohol bottle | 0.30 |

Mineral water RM 0.50 per bottle
 Soft Drink RM 1.00 per tin
 Toilet Paper RM 4.00 per package
 Rice (Beras wangi)
 5 Kg – RM 12.00 10 Kg – RM 25.00

5. Case Study 4 <Source Separation at Institution (MPSJ complex) in MP Subang Jaya>

1) Source Separation Introduced at Target Area

| | |
|---|---|
| Collection Method | Station collection for papers |
| Target Items | Paper (reduction of papers) |
| Collection Frequency | <ul style="list-style-type: none"> Once a week for recyclable items by an appointed recycling agent. |
| Equipments for source separation | <ul style="list-style-type: none"> 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 | <p>4 Separation : White paper, mixed paper and other recyclable materials, non-recyclables (organic wastes, etc)</p> <p>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.</p> |
| Collector | Private Collector |
| Collection Fee | No additional fee for collection |
| Incentives | 3Rs Competition |



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



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



Recyclables collected are weighed for competition

Appendix 5: Standard Format for Reporting Recyclable Collection by LA to MHLG

| RECYCLABLES COLLECTION DATA FORM | | | | | | | | | | |
|---|------------------------------------|------|---------------------|------------|--|--|--|--|--|--------------|
| Name of Local Authority | | Year | Total MSW Collected | tonnes/mth | | | | | | Total (kg) ▼ |
| Month | Receivers / Traders ▶ | | | | | | | | | |
| 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) | | | | | | | | | |

Appendix 6: List of Contacts

| NO. | Name | Address | Contact No. |
|------------|--|---|--|
| 1.0 | GOVERNMENT AGENCIES | | |
| 1.1 | MINISTRY OF HOUSING & LOCAL GOVERNMENT | Level 3-7, Block K Pusat Bandar Damansara 50782 KUALA LUMPUR | Tel: 03-2094 7381 FAX:03-2093 3529 www.kitarsemula.com |
| 2.0 | LOCAL AUTHORITIES (MEMBER OF CORE TEAM) | | |
| 2.1 | MAJLIS PERBANDARAN PULAU PINANG | WASTE MINIMIZATION UNIT, Urban Services Department, Jalan Padang Kota Lama, 10200 PULAU PINANG | Tel: 04-263 3000 FAX: 04-263 3036 www.rnumppp.net/ |
| 2.2 | MAJLIS BANDARAYA MIRI | PUBLIC SERVICES SECTION/ WASTE MINIMIZATION UNIT, Majlis Bandaraya Miri Jalan Kingsway 98000 MIRI | Tel: 085-426 984 Tel/Fax: 085-415 486 E-MAIL: rnu.mbm@gmail.com www.rnu.mbm.com |
| 2.3 | MAJLIS PERBANDARAN SUBANG JAYA | WASTE MINIMIZATION UNIT, Majlis Perbandaran Subang Jaya Persiaran Perpaduan Jalan USJ 5 47610 SUBANG JAYA | Tel: 03-8026 3161 FAX: 03-8024 5235 www.rnumpsj.net/ |
| 3.0 | SOLID WASTE CONCESSIONAIRE | | |
| 3.1 | ALAM FLORA SDN BHD | LEVEL 4, WISMA DRB-HICOM, No. 2, Jalan Usahawan U1/8, Seksyen U1, 40150 SHAH ALAM | Tel: 03-2052 7922 FAX: 03-2052 8144 Tool free: 1-800-880-880 E-mail: feedback@alamflora.com.my www.alamflora.com.my |
| 3.2 | SOUTHERN WASTE MANAGEMENT SDN BHD | No. 20, Jalan Wan Kadir 1 Taman Tun Dr Ismail 60000 KUALA LUMPUR | Tel: 03-7726 9619 FAX: 03-7726 9062 E-mail: info@swmsb.com www.swmsb.com . |

