

**MINISTRY OF HOUSING AND LOCAL GOVERNMENT
MALAYSIA**

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

FINAL REPORT

Summary

JULY 2006

JAPAN INTERNATIONAL COOPERATION AGENCY

YACHIYO ENGINEERING CO., LTD.

EX CORPORATION

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The Study on National Waste Minimisation in Malaysia
Final Report

FINAL REPORT COMPOSITION

The Final Report is composed of the following:

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

This Report is “Summary”.

PREFACE

In response to a request from the Government of Malaysia, the Government of Japan decided to conduct a study on “The Study on National Waste Minimisation in Malaysia” and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Noboru Saeki of YACHIYO ENGINEERING Co., LTD. and consisted of experts from YACHIYO ENGINEERING Co., LTD. and EX CORPORATION between July 2004 and June 2006. In addition, JICA set up an advisory committee headed by Dr. Yasushi Matsufuji, Professor at Department of Civil Engineering, Faculty of Engineering, Fukuoka University, which examined the study from specialist and technical points of view.

The team held discussions with the officials concerned of the Government of Malaysia and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Malaysia for their close cooperation extended to the study.

July 2006

Ariyuki Matsumoto
Vice President
Japan International Cooperation Agency

July 2006

Mr. Ariyuki MATSUMOTO
Vice President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

We are pleased to submit to you the final report of the Study on National Waste Minimisation in Malaysia. The report includes the advice and suggestions of the authorities concerned of the Government of Japan and your Agency. Also included are comments made by the Ministry of Housing and Local Government and related authorities in Malaysia.

The report deals with the present conditions of solid waste minimisation and 3Rs in Malaysia and presents the Master Plan and Action Plan on Waste Minimisation, as well as a set of guidelines on waste minimisation for all the related players.

In accordance with the contract with your Agency, we Yachiyo Engineering Co., Ltd. and EX Corporation implemented this study during the period of July 2004 to July 2006. Based on a deep understanding of the existing conditions in Malaysia we have prepared a plan that is feasible and can be implemented.

Finally, we sincerely hope that this report will be effectively used for the realisation of the plan. We wish to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs and Ministry of the Environment. We also wish to express our deep gratitude to the Ministry of Housing and Local Government and the relating organizations in Malaysia for the close cooperation and assistance extended to us during the Study.

Very truly yours,

Noboru SAEKI
Team Leader
The Study on National Waste Minimisation in Malaysia

EXECUTIVE SUMMARY

1 INTRODUCTION

1.1 Background of the Study

Since the mid eighties solid waste generated in urban areas has been increasing year by year due to rapid urbanisation and diversity of lifestyles in Malaysia. As a result of rapid urbanisation, problems of increasing waste management cost and securing landfill sites have arisen in the country.

The Ministry of Housing and Local Government (MHLG) has taken the lead in promoting and establishing recycling systems, however the Malaysian data shows that the rate of recycling of solid waste remains at about 2 to 5%.

In response to an official request from the Government of Malaysia, the Japan International Cooperation Agency (hereinafter referred to as “JICA”), the official agency responsible for implementation of technical cooperation programmes of the Government of Japan, conducted this Study on National Waste Minimisation in Malaysia (hereinafter, “the Study”).

The Study was implemented in two phases. Phase 1 commenced in July 2004 and was completed by the end of March 2004 whilst Phase 2 started in May 2005 and ended in July 2006. The entire Study period was about 25 months.

1.2 Objectives and Output of the Study

Objectives of the Study are as follows:

- (1) To formulate the Master Plan, Action Plans and Guidelines necessary to promote Waste Minimisation (Reduce, Reuse, Recycle) in line with the National Strategic Plan for Solid Waste Management in Malaysia (NSP). Components of the Study include:
 - i) Solid Waste Minimisation Master Plan
 - ii) Solid Waste Minimisation Action Plans
 - a. Solid Waste Minimisation Action Plan for Federal Government
 - b. Solid Waste Minimisation Action Plan for LAs
 - iii) Solid Waste Minimisation Guidelines for use by implementing agencies such as LAs, private sector entities, schools, NGOs, CBOs and the general public
- (2) To strengthen the institutional capacity of the public sector on management of waste minimisation.
 - i) Federal Government: raising planning capability
 - ii) LAs: raising capability to manage/monitor waste management service

1.3 Study Area and Target Waste

The Study covers Peninsular Malaysia as well as East Malaysia.

The waste types targeted for minimisation include household, commercial and industrial waste types. Scheduled wastes were not included in the Study.

2 MASTER PLAN FOR WASTE MINIMISATION

2.1 Objectives

The Objectives of the Master Plan on National Waste Minimisation (WM-M/P) is to provide Vision, Strategies and Roles of Stakeholders to minimise the amount of solid waste disposed in Malaysia. The WM-M/P embodies the principles of the National Strategic Plan for Solid Waste Management.

2.2 Visions

The ultimate vision of the WM-M/P is:

*“To realise a **Material Cycle Society**, where waste minimisation activities are systemised and sufficiently enrooted in the behaviour of government, private sector, and the people in Malaysia”*

To realise such a *society*, it is of great necessity to reduce waste generation at source, to minimise the amount of waste disposed at landfills and to maximise the efficiency of resource utilisation.

2.3 Strategies

Based on an appreciation of current issues and to realise the vision and achieve the set target, strategies should be established, considering the need for:

1. A deeply rooted *awareness* within the Malaysian society on the importance of waste minimisation;
2. A mechanism of waste minimisation based on the *partnership* of government, private sector, and general public and participation of stakeholders from all levels of the Malaysian community;
3. Proper recognition and practice of waste minimisation that can be sustained by market mechanism and with *government involvement* in the development of an environment that encourages all participants to implement the 3Rs (Reduce, Reuse, and Recycle); and
4. Practice of waste minimisation in accordance with the hierarchy of 3Rs.

To realise this vision of a *“Material Cycle Society”*, the following three comprehensive strategy areas form the basis of the WM-M/P. These strategies are targeted at the three key stakeholders: the government, private sector and the general public.

- *Enhancement of Awareness on Waste Minimisation (Awareness)*
- *Strengthening of Partnership for 3Rs Activities (Partnership)*
- *Enhancement of Institution to Strengthen Government Policies on Waste Minimisation*

2.4 Framework

The framework of the WM-M/P is as follows:

- Target Wastes are household, commercial, institutional, industrial and construction wastes
- Target Area covers all of Malaysia
- Target Year is 2020, which coincides with the target year for the National Strategic Plan (NSP) and Vision 2020

3 ACTION PLAN FOR WASTE MINIMISATION

3.1 Action Plan for the Federal Government

In line with the WM-M/P vision of realising a “Material Cycle Society” by 2020 and the WM-M/P strategies, the Action Plan for the Federal Government with a target year of 2010 was prepared.

The relationship between the WM-M/P strategies and the Federal Action Plan is shown in Table 1 and outline of the Action Plan is shown in Table 2.

Table 1 Master Plan Strategies and Federal Action Plan

M/P Strategies	Federal Action Plan
Strategy-1: Enhancement of Awareness on Waste Minimisation	Action-1: Enhancement of Awareness Raising Activities under the National Recycling Programme (NRP) Action-2: 3R Activities in Schools
Strategy-2: Strengthening of Partnership for 3Rs Activities	Action-3: Formulation of Stakeholders’ Networking and Development of Partnership Activities on 3Rs
Strategy-3: Enhancement of Institution to Strengthen Government Policies on Waste Minimisation	Action-4: Strengthening of Legal, Regulatory and Financial Mechanism
	Action-5: Improvement of Information Management
	Action-6: Provision of Guidance to LAs on LAP-WM

3.2 Action Plan for Local Authorities

As highlighted in the WM-M/P, LAs have to play a key role in waste minimisation and to initiate the programme even though the local community and private entities may do the actual activities. Prior to initiating waste minimisation, the respective LA needs to formulate its own Local Action Plan that serves as a road map for that LA to achieve waste minimisation and its recycling targets – targets that need to take into account the LA’s conditions, capability and limitations. The aim of the Action Plan is to get the LAs to participate and contribute towards the achievement of the national recycling target of 22% by the year 2020 set by the NSP.

The LAPs-WM at four (4) model LAs were prepared based on the following outline:

- (1) Necessity of Waste Minimisation in the LA
- (2) State of Waste Management and Recycling in the LA
- (3) Targets of Waste Minimisation and Recycling
- (4) Actions to Achieve the Targets
- (5) Monitoring and Implementation Schedule for the Action Plans

Table 2 Outline of the Federal Action Plan for Waste Minimisation

Action Plan		Target/ Performance Indicators	Responsible Agencies	Cost (RM)
Actions	Detailed Activities			
Action-1: Enhancement of Awareness Raising Activities under the National Recycling Programme (NRP)	A1-1: Improvement of the National Recycling Programme	Households interview survey nation-wide to determine extent of strengthened public awareness on Authorisation	MHLG	15,625,000
	A1-2: Implementation of Nation-wide Awareness Campaign on Source Separation		MHLG, LAs	
	A1-3: Development and Training of Leaders for Promotion of 3Rs		MHLG, LAs	
	A1-4: Promotion of Green Purchasing and Waste Reduction at Source		MHLG, MITI	
Action-2: 3Rs Activities in Schools	A2-1: Dissemination of the “Guidelines for the Enhancement of 3Rs Activities in Schools”	10 LAs & 4 States implement School 3Rs programme	MHLG, MOE	6,640,000
	A2-2: Formulation of Award Programme for 3Rs Activities in Schools		LAs, States	
	A2-3: Implementation and Monitoring of 3Rs Activities in Schools		Pupils, Teachers, LAs, States	
Action-3: Formulation of Stakeholders’ Networking and Development of Partnership Activities of NGOs/CBOs	A3-1: Formulation of National Annual Plan for Organising Stakeholders’ Networking and Implementation of Source Separation	Recycling rate reaches 11% in 2010	MHLG	123,075,000
	A3-2: Formulation of Stakeholders’ Networking		LAs, Private sectors	
	A3-3: Implementation of Pilot 3Rs Activities		LAs, States	
	A3-4: Development of Partnership Activities on 3Rs by NGOs/ CBOs		MHLG, LAs, NGOs/CBOs	
Action-4: Strengthening Legal, Regulatory and Financial Mechanism	A4-1: Preparation of Rules and Regulations under SWM Act	SWM Act, WM M/P & A/P and By-Law on SWM are authorised and enacted	MHLG, EPU	580,000
	A4-2: Authorisation and Implementation of WM-M/P		MHLG, EPU	
	A4-3: Amendment of By-Law on SWM		MHLG, LAs	
	A4-4: Financial Support to LAs for Formulation and Implementation of LAP-WM		MHLG, EPU	
Action-5: Improvement of Information Management	A5-1: Establishment of Information Management System	All LAs participate in IMS WMU is established in all LAs	MHLG, LAs, Concessionaires	2,495,000
	A5-2: Implementation and Monitoring of IMS		MHLG, LAs, Concessionaires	
Action-6: Provision of Guidance to LAs on LAP-WM	A6-1: Formulation of National Annual Plan for LAPs-WM	All LAs formulate and implement LAPs on waste minimisation	MHLG	22,955,000
	A6-2: Dissemination of the Guidelines for LAP-WM		MHLG	
	A6-3: Establishment of Waste Minimisation Unit in LAs		MHLG, LAs	
	A6-4: Formulation, Implementation and Monitoring of LAP-WM		MHLG	

Total: RM 171,370,000

4 GUIDELINES

Based on the experiences gained during the Study and the drafting of the WM-M/P and A/P, waste minimisation guidelines were prepared as shown in Table 3.

Table 3 Waste Minimisation Guidelines

No	Title of Guidelines	Target Group
1	Guidelines for Enhancement of 3Rs Activities in Schools	School teachers
2	Guidelines for Formulation of LAP-WM	LAs
3	Guidelines for Source Separation of MSW	LAs
4	3Rs Action Guide (3RAG)	Various stakeholders

5 PILOT PROJECTS

In line with the JICA Study on the formulation of the WM-M/P and A/P for the Federal Government, a number of Pilot Projects (PPs), as shown in Table 4, were implemented to examine and demonstrate the effects and practicability of the recommended components of the WM-M/P and A/P.

Table 4 Pilot Projects of the Study

Pilot Projects	Project Purpose	Project Components
PP-I: Establishment of National Recycling Information System	<ol style="list-style-type: none"> 1. Establishing the Recycling Networking Unit (RNU) in MHLG to function as a base of 3Rs data accumulation and disbursement in Malaysia. 2. Enhancement of capacity of MHLG to monitor SWM & 3Rs activities at the Federal level. 	<ol style="list-style-type: none"> 1. Establishment of Recycling Networking Unit (RNU) 2. Establishment of data management system on Solid Waste Management (SWM) and 3Rs at the national level 3. Establishment of Information Management System (IMS) 4. Capacity Development of MHLG
PP-II: Local Recycling Network and Source Separation of MSW	<ol style="list-style-type: none"> 1. Realising sustainable recycling through the partnership of stakeholders. 2. Establishing Waste Minimisation Unit (WMU) in LAs to function as a focal point on 3Rs. 3. Improvement of capacity of LAs to monitor recycling activity. 4. Increase of collection amount of recyclable materials separated at source. 	<p><PP-II-1: Establishment of Local Recycling Network in Model LAs></p> <ol style="list-style-type: none"> 1. Establishment of Waste Minimisation Unit (WMU) 2. Establishment of recycling network in LAs 3. Establishment of data management system on SWM and 3Rs Activities 4. Development of 3Rs awareness promotion <p><PP-II-2: Source Separation of MSW></p> <ol style="list-style-type: none"> 1. Establishment of source separation system 2. Implementation of campaign for 3Rs 3. Implementation of questionnaire survey 4. On-the-Job Training
PP-III: Authorisation Activities in Primary & Secondary Schools	<ol style="list-style-type: none"> 1. Preparation and verification of Guidelines 2. Enhancement of awareness on 3Rs for students and teachers. 	<ol style="list-style-type: none"> 1. Preparation of the “Guidelines on Enhancement of 3Rs Activities in Schools” 2. Implementation of 3Rs Activities programmes in schools in Johor (Trial of the Guidelines) 3. Implementation of 3Rs Award Programme for schools in Miri

6 RECOMENDATIONS

6.1 Authorisation of Waste Minimisation Master Plan and Federal Action Plan

The WM-M/P and Federal Action Plan should be authorised without delay and implementation should start immediately thereafter. Furthermore, the “Solid Waste Management Act”, which will form the basic law on SWM in Malaysia, should also be authorised and enacted in due time.

6.2 Improvement of the National Recycling Programme

Improvement and continuous implementation of the National Recycling Programme (NRP) is required. The recommended main programmes for the improvement of NRP include:

- Nation-wide campaign on source separation
- Nation-wide promotion of eco-products and green purchasing

6.3 Nation-wide Practice of Source Separation

“Source separation” is a key measure for waste minimisation in Malaysia. MHLG needs to expand source separation activities nation-wide: firstly, by preparing national annual plan for source separation; secondly, by conducting nation-wide campaigns on source separation; and thirdly, by setting up networking amongst stakeholders at both the federal and local levels.

6.4 Strategic Education and Awareness Programme

Under the joint collaboration of the Ministry of Housing and Local Government (MHLG) and the Ministry of Education (MOE), the following strategic education and awareness programme should be introduced.

- Nation-wide dissemination of the “Guidelines for the Enhancement of 3Rs Activities in Schools.”
- Formulation and implementation of 3Rs award programme for schools at LA, State and National levels.

6.5 Continuation and Expansion of the Information Management System

MHLG should be the focal point of all information and data on 3Rs. MHLG has established the “Recycling Information Centre” within the Ministry and a pilot project involving ten LAs was carried out by the JICA study to establish a data management system on solid waste management and 3Rs on the national level. This information management system should be continued and expanded to all LAs in Malaysia.

6.6 Strengthening of Institutional System

On the Federal level, the Recycling Networking Unit (RNU) within MHLG should have sufficient staff and budget to sustain its activities. A Waste Minimisation Promotion Committee should be established comprising relevant federal and local government agencies and related stakeholders with MHLG as the coordinating body.

On the LA level, there is a need to establish a Waste Minimisation Unit (WMU) in each LA to function as a communication platform amongst all the related stakeholders and focal points on 3Rs. MHLG should formulate the regulative mechanism to establish the WMU in the LAs.

6.7 Waste Minimisation and Privatisation

It is generally accepted that the promotion of waste minimisation and/or recycling would lead to a reduction of the amount of waste collected and disposed, and in consequence significantly affect current payment mechanisms to SWM companies and/or concessionaires in the country. The following measures need to be considered for more effective promotion of waste minimisation in Malaysia.

- Recycling activities such as collection and treatment of recyclables and awareness activities may be partially provided by SWM companies and/or concessionaires.
- Means of payment to the SWM companies and/or concessionaires for their services need to be re-considered. For example, in addition to the present amount base payment, service-quality base payment also needs to be considered.

Table of Contents

Preface

Letter of Transmittal

Executive Summary

Table of Contents

List of Tables

List of Figures

List of Plates

Abbreviations

1. INTRODUCTION	1
1.1 Background.....	1
1.2 Objective of the Study	1
1.3 Study Area	2
1.4 Target Waste of Minimisation	2
1.5 Outline and Schedule of the Study.....	2
1.6 Study Organisation	5
1.7 Study Outputs	5
2. THE NEED FOR WASTE MINIMISATION	6
2.1 The Development Commitments Malaysia has made.....	6
2.2 National Strategic Plan for Solid Waste Management (NSP).....	6
2.3 Current Issues on Waste Minimisation	7
2.3.1 Appreciation of the Current SWM	7
2.3.2 Major Issues on Current Waste Minimisation Activities	8
2.4 Study Outputs	9
3. MASTER PLAN FOR WASTE MINIMISATION.....	11
3.1 Objectives and Scope of the Master Plan	11
3.1.1 Objective	11
3.1.2 Target Waste.....	11
3.1.3 Target Area.....	11
3.1.4 Target Year	11
3.2 Vision.....	11
3.3 Strategies.....	12
3.3.1 Outline.....	12

3.3.2	Strategy 1: Enhancement of Awareness on Waste Minimisation.....	14
3.3.3	Strategy 2: Strengthening of Partnership for 3Rs Activities	17
3.3.4	Strategy 3: Enhancement of Institution to Strengthen Government Policies on Waste Minimisation.....	20
3.4	Roles of Stakeholders.....	23
4.	ACTION PLAN AT THE FEDERAL LEVEL.....	26
4.1	Introduction.....	26
4.1.1	Objectives of the Federal Action Plan.....	26
4.1.2	Interfacing of Master Plan and Action Plan	26
4.2	Model Local Authorities Action Plans.....	46
4.3	Guidelines	50
5.	PILOT PROJECTS.....	51
5.1	Objectives of the Pilot Projects	51
5.2	Implementation Framework of Pilot Projects	51
5.3	PP-I: Establishment of National Recycling Information System	52
5.4	PP-II: Local Recycling Network and Source Separation of MSW.....	56
5.5	PP-III: 3Rs Activities in Primary & Secondary Schools.....	68
5.6	Evaluation of Pilot Projects	75
6.	FINAL SEMINAR ON NATIONAL WASTE MINIMISATION STUDY IN MALAYSIA.....	79
7.	RECOMMENDATIONS.....	81
	Recommendation 1: Authorisation of Waste Minimisation Master Plan and Federal Action Plan.....	81
	Recommendation 2: Improvement of the National Recycling Programme.....	81
	Recommendation 3: Nation-wide Practice of Source Separation.....	81
	Recommendation 4: Strategic Education and Awareness Programme	82
	Recommendation 5: Continuation and Expansion of the Information Management System	82
	Recommendation 6: Strengthening of Institutional System.....	83
	Recommendation 7: Waste Minimisation and Privatisation	83

List of Tables

Table 2.1	Major Recyclable Items from Municipal Waste.....	8
Table 3.1	Key-personnel/ Organisation Leading Awareness Raising Activities.....	16
Table 3.2	Partnership Building among Key Stakeholders.....	19
Table 4.1	Master Plan Strategies and Federal Action Plan	27
Table 4.2	Outline of the Federal Action Plan	29
Table 4.3	Implementation Steps and Schedule of Action-1	32
Table 4.4	Implementation Steps and Schedule of Action-2	34
Table 4.5	Implementation Steps and Schedule of Action-3	37
Table 4.6	Implementation Steps and Schedule of Action-4	40
Table 4.7	Implementation Steps and Schedule of Action-5	42
Table 4.8	Implementation Steps and Schedule of Action-6	45
Table 4.9	Issues Faced and Countermeasures Taken for the Formulation of LAPs.....	49
Table 4.10	Outline of Guidelines Prepared by the Study	50
Table 5.1	Pilot Projects and Target Groups.....	51
Table 5.2	Implementation Schedule of PP-I.....	52
Table 5.3	List of PP-I Participating LAs	53
Table 5.4	New Recyclables Collection Data Form	54
Table 5.5	Implementation Schedule of PP-II	56
Table 5.6	Activities and Results of PP-II-1	58
Table 5.7	Summary of Results of Source Separation for Households.....	62
Table 5.8	Implementation Schedule of PP-III	68
Table 5.9	Outline of the Programmes for Schools in Johor	70
Table 5.10	Examples of 3Rs Activities in Primary and Secondary Schools	71
Table 5.11	Results of the Implemented Pilot Projects.....	76

List of Figures

Figure 1.1	Outline of the Study	2
Figure 1.2	Flow Chart of the Study	3
Figure 1.3	Study Organisation.....	5
Figure 2.1	National Development Plans and SWM Plans in Malaysia	6
Figure 2.2	WM-M/P within the Framework of National Strategic Plan for Solid Waste Management.....	7
Figure 2.3	Study Flow and Output	10
Figure 3.1	Three Key Stakeholders and Strategies for Waste Minimisation.....	13
Figure 3.2	Schematic Diagram of RIC in the Master Plan	23
Figure 4.1	Organisation Framework for the A/P Formulations.....	46

Figure 4.2	Basic Procedure for Formulation of LAP-WM.....	48
Figure 5.1	Implementation Framework of Pilot Projects I, II, III	52
Figure 5.2	Basic Structure of the IMS	55
Figure 5.3	Organisation Framework for the Implementation of PP-II	57
Figure 5.4	Flow Chart for Implementation of PP-II-2 Source Separation.....	61
Figure 5.5	Result of Awareness Survey (pre, mid and post PP).....	63
Figure 5.6	Flow Chart for the “Guidelines for Source Separation”.....	64
Figure 5.7	Flow Chart of 3Rs Award Programme.....	71

List of Plates

Plate 5.1	PP-II Activities in MPPP	65
Plate 5.2	PP-II Activities in MPSJ.....	66
Plate 5.3	PP-II Activities in MBM	67
Plate 5.4	PP-III Activities in Johor State	73
Plate 5.5	PP-III Activities in MBM.....	74
Plate 6.1	Record of 4th (Final) Seminar (1st & 2nd June 2006)	80

Abbreviations

AFSB	Alam Flora Sdn Bhd
A/P	Action Plan
CBO	Community Based Organisation
C/P	Counterpart
DB	Dewan Bandaraya (City Hall)
DBKL	Dewan Bandaraya Kuala Lumpur (Kuala Lumpur City Hall)
DBKU	Dewan Bandaraya Kuching Utara (Kuching North City Hall)
DSWM	Division of Solid Waste Management
EPU	Economic Planning Unit
G3RS	Guidelines for Enhancement of 3Rs Activities in School
IEC	Information, Education and Communication
IMS	Information Management System
JICA	Japan International Cooperation Agency
LA	Local Authority
LAP-WM	Local Action Plan on Waste Minimisation
LGD	Local Government Department
MB	Majlis Bandaraya (City Council)
MBJB	Majlis Bandaraya Johor Bahru (Johor Bahru City Council)
MBKS	Majlis Bandaraya Kuching Selatan (Kuching South City Council)
MBM	Majlis Bandaraya Miri (Miri City Council)
MBMB	Majlis Bandaraya Melaka Bersejarah (Melaka City Council)
MD	Majlis Daerah (District Council)
MDK	Majlis Daerah Kerian
MDKS	Majlis Daerah Kinta Selatan (South Kinta District Council)
MHLG	Ministry of Housing and Local Government
MIDA	Malaysian Industrial Development Authority
MITI	Ministry of International Trade and Industry
MOE	Ministry of Education
MONRE	Ministry of Natural Resources and Environment
MP	Majlis Perbandaran (Municipal Council)
M/P	Master Plan
MPK	Majlis Perbandaran Kuantan (Kuantan Municipal Council)
MPPP	Majlis Perbandaran Pulau Pinang (Pulau Pinang Municipal Council)
MPPJ	Majlis Perbandaran Petaling Jaya (Petaling Jaya Municipal Council)
MPSJ	Majlis Perbandaran Subang Jaya (Subang Jaya Municipal Council)
MSW	Municipal Solid Waste
NCP3R	National Children's Programme on 3Rs
NGO	Non Governmental Organisation
NRD	National Recycling Day
NRP	National Recycling Programme
NSP	National Strategic Plan on Solid Waste Management
OECD	Organisation for Economic Co-operation and Development
OPP3	Third Outline Perspective Plan
PDM	Project Design Matrix
PP	Pilot Project
PR	Public Relations
PWD	Public Works Department
RA	Residents Association
R&D	Research and Development
RIC	Recycling Information Centre
RM-8	Eighth Malaysian Plan

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

1. INTRODUCTION

1.1 BACKGROUND

Solid waste generated in urban areas has been increasing year by year due to the rapid urbanisation and diversity of lifestyles in Malaysia since the mid 1980s. Increasing waste management cost and securing final disposal landfills has become one of the most serious social issues in Malaysia.

Responding to this emerging issue, the Government of Malaysia, in the 8th Malaysia Plan (2001-2005), has included “waste minimisation,” “promotion of reuse,” “developing a recycling-oriented society,” and “implementation of pilot projects for recycling” as some of its main policy goals. The 9th Malaysia Plan (2006 – 2010) further emphasised the continuation of reduce, reuse, recovery and recycling of waste as well as greater use of environmentally friendly products.

In line with the basic policy framework articulated in the above plans, the Ministry of Housing and Local Government (MHLG) has been conducting national programmes for the promotion of recycling and public awareness on 3Rs activities. Pilot projects under Local Agenda 21 were also carried out to promote recycling activities through public participation. However, the efforts of waste minimisation are still limited to some environmentally aware stakeholders and the recycling rate of solid waste still remains at a low level of 2 to 5%.

In response to the official request from the Government of Malaysia, the Study on National Waste Minimisation in Malaysia was carried out for the purpose of presenting the vision, strategies and plans for realising an environmentally sustainable society in Malaysia.

1.2 OBJECTIVE OF THE STUDY

The objectives of the Study are as follows:

- (1) To formulate the Master Plan, Action Plans and Guidelines noted below to promote Waste Minimisation (Reduce, Reuse, Recycle) in line with the National Strategic Plan for Solid Waste Management in Malaysia
 - i) Solid Waste Minimisation Master Plan
 - ii) Solid Waste Minimisation Action Plans
 - a. Solid Waste Minimisation Action Plan for Federal Government
 - b. Solid Waste Minimisation Action Plan for Local Authorities (LAs)
 - iii) Solid Waste Minimisation Guidelines for the use by the potential implementing organisations of waste minimisation activities such as LAs, private sectors, NGOs, CBOs, and general public.
- (2) To strengthen the institutional capacity of the public sector in promoting waste minimisation through:
 - i) Capacity development of the Federal Government in formulating and implementing national policies, plans and programmes on waste minimisation; and
 - ii) Capacity development of LAs in formulating and implementing local plans and programmes on waste minimisation based on close partnership with relevant stakeholders.

1.3 STUDY AREA

The Study covers the whole of Malaysia.

1.4 TARGET WASTE OF MINIMISATION

In the Study, household, commercial and industrial solid wastes, other than scheduled waste, are targeted for minimisation.

1.5 OUTLINE AND SCHEDULE OF THE STUDY

The Outline and Schedule of the Study are shown in Figure 1.1 and Figure 1.2, respectively.

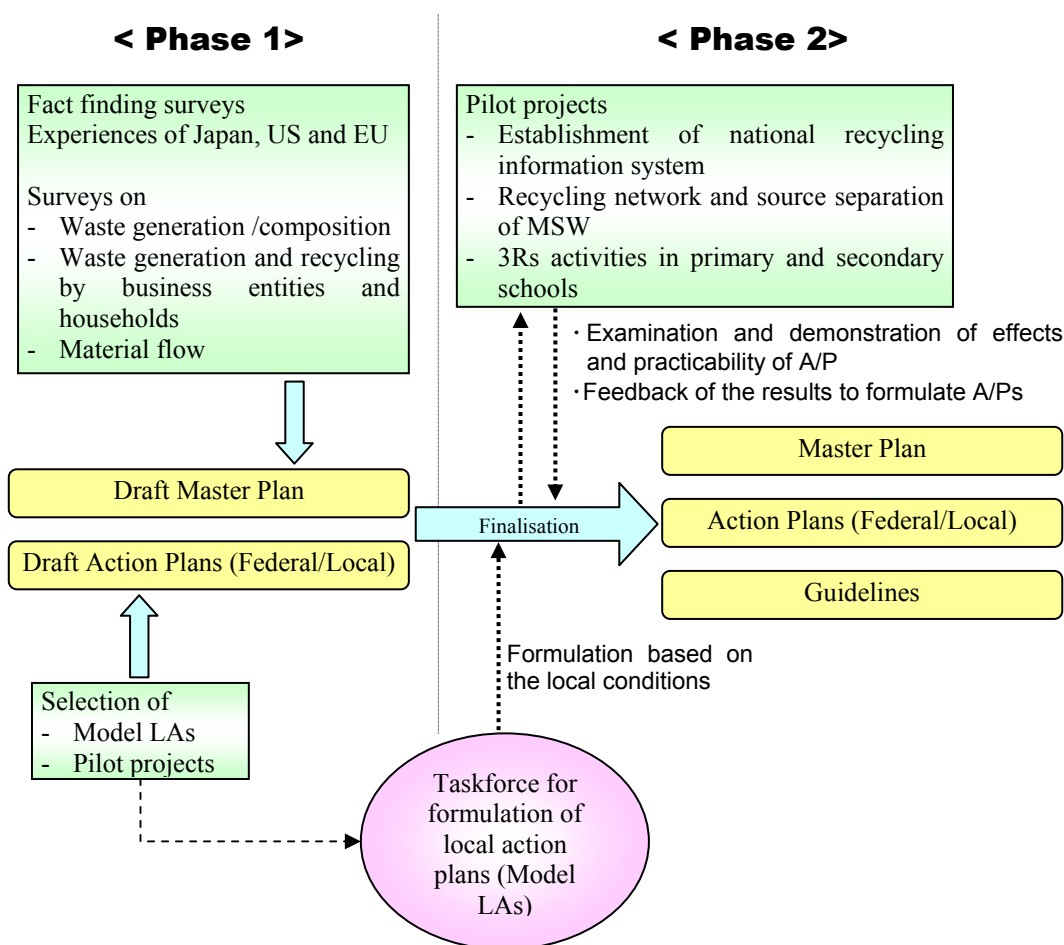


Figure 1.1 Outline of the Study

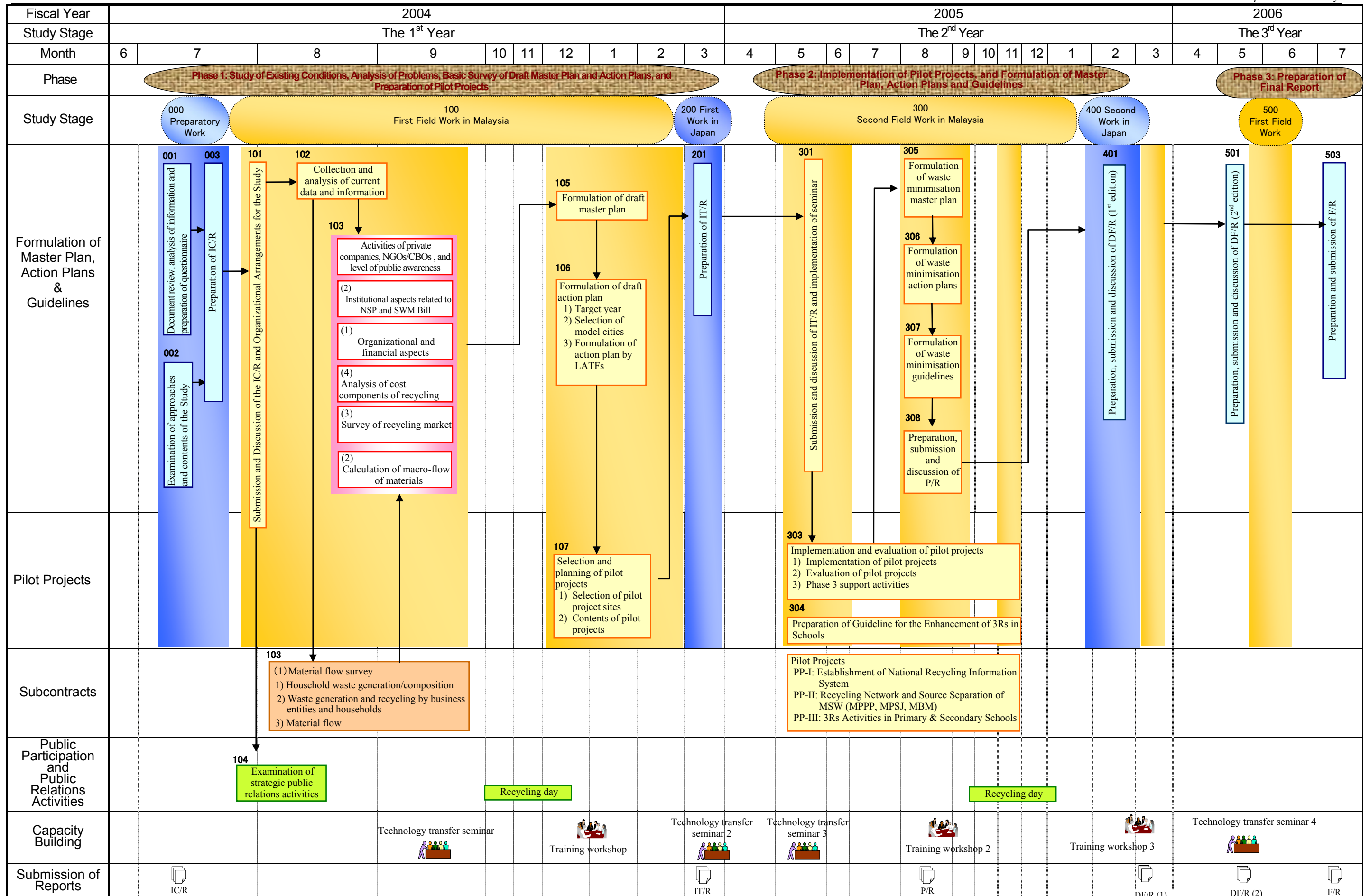


Figure 1.2 Flow Chart of the Study

1.6 STUDY ORGANISATION

The Study organisation was as shown in Figure 1.3.

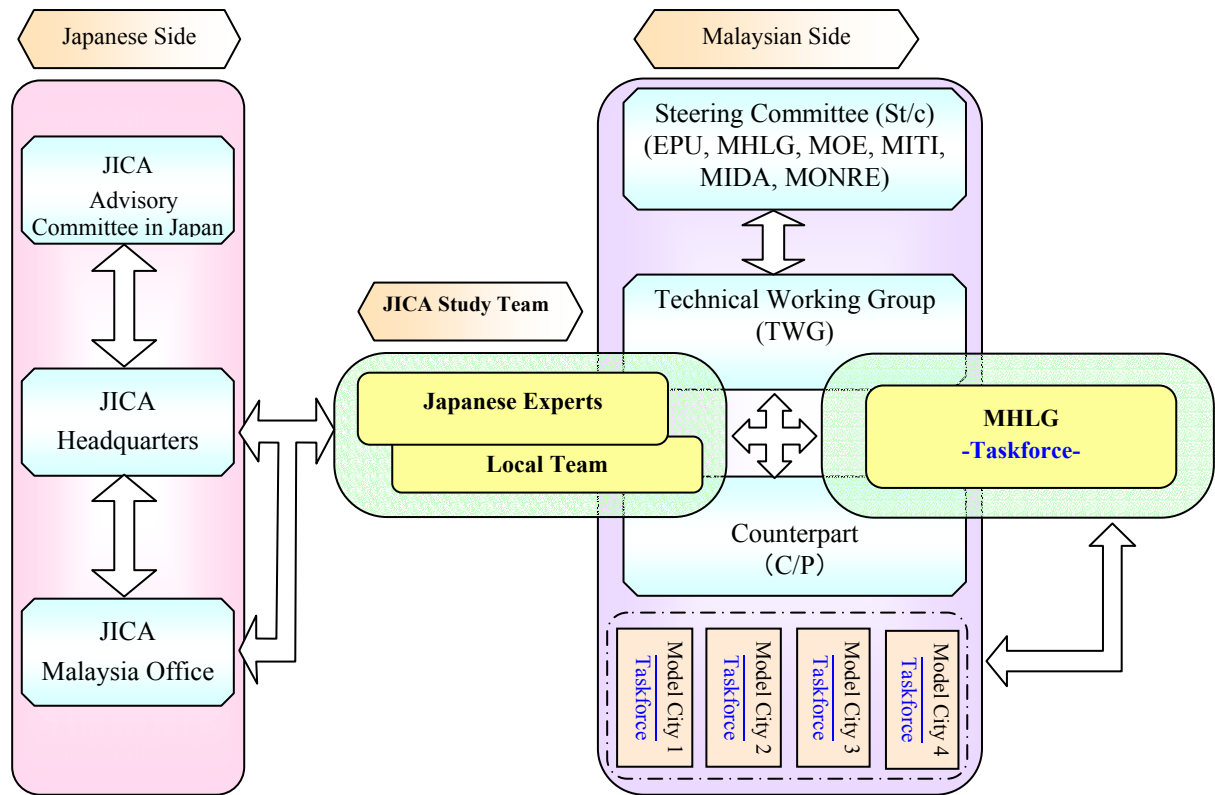


Figure 1.3 Study Organisation

1.7 STUDY OUTPUTS

The outputs of the Study is summarised as follows:

- i. Waste Minimisation Master Plan (WM-M/P) for the whole of Malaysia, focusing on municipal solid wastes and with the target year of 2020
- ii. Waste Minimisation Action Plan at the Federal Level with the target year of 2010
- iii. Guidelines
 - Guidelines for Enhancement of 3Rs Activities in Schools
 - Guidelines for Formulation of Local Action Plan on Waste Minimisation (LAP-WM)
 - Guidelines for Source Separation of Municipal Solid Waste
 - 3Rs Action Guide (3RAG)
- iv. Pilot Projects (PP-I, II and III) Implementation and Reports
 - PP-I: Establishment of National Recycling Information System
 - PP-II: Local Recycling Network and Source Separation of MSW
 - PP-III: 3Rs Activities in Primary & Secondary Schools
- v. LAP-WM in MPSJ, MDKS, MBM and MPPP

2. THE NEED FOR WASTE MINIMISATION

2.1 THE DEVELOPMENT COMMITMENTS MALAYSIA HAS MADE

The Government of Malaysia has within the last decade adopted ambitious development plans and today the people of Malaysia enjoy higher standards of living within a dynamically developing economy. As consumption habits grow and solid waste management problems show an increase, the past decade has also witnessed a number of SWM plans to deal with these problems. The WM-M/P is a logical continuation of these SWM plans and comes at a good time to positively impact the course of development. These national development plans and SWM plans are chronologically depicted in the following chart.

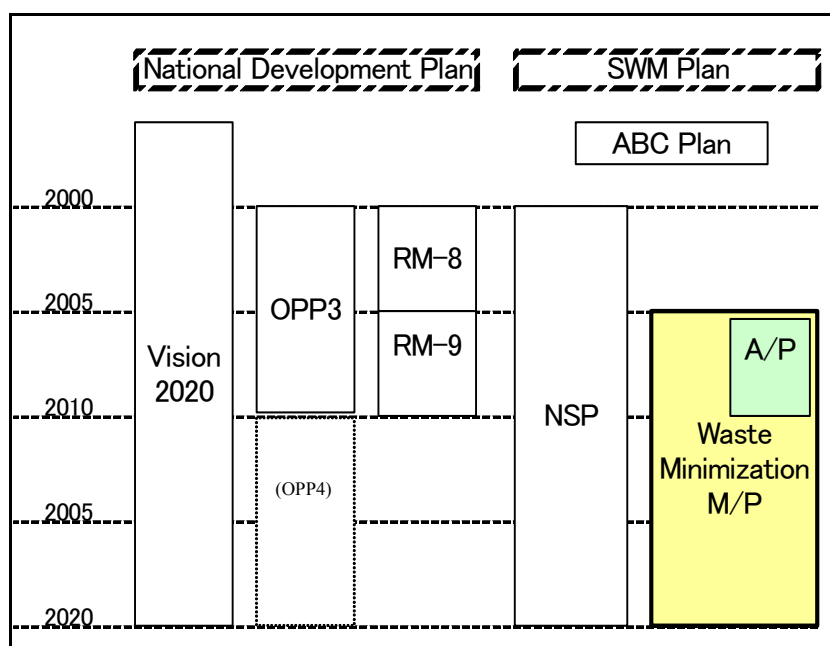


Figure 2.1 National Development Plans and SWM Plans in Malaysia

“VISION 2020”, declared in 1990, sets a challenge for Malaysia to become a fully developed nation by the year 2020. The nation would pursue environmentally sustainable development as the basis for development. The Third Outline Perspective Plan (OPP3, 2001-2010), which constitutes the second decade of development under Vision 2020, stresses the importance of reducing energy, materials, pollution, and waste intensity of urban and industrial activities. And in the Eighth Malaysian Plan (RM-8, 2001-2005) covering the first phase of the OPP3, it is clearly articulated that a comprehensive waste management policy to address the issues of waste reduction, reuse, and recycling will be introduced. The recently announced Ninth Malaysian Plan (RM-9) stated that despite ongoing efforts the recycling rate remained low at 5%. RM-9 confirmed that the priority for the 3Rs would continue and awareness raising campaigns would be increased.

2.2 NATIONAL STRATEGIC PLAN FOR SOLID WASTE MANAGEMENT (NSP)

As a basis for SWM policy, the National Strategic Plan (NSP) was formulated in 2002 and adopted in 2005. The National Policy on Municipal Solid Waste Management succeeded the National Solid Waste Management Action Plan, which was formulated in 1988 and denominated as the ABC Plan (Action Plan for a Beautiful and Clean Malaysia). NSP sets out as one of the key strategies to achieve “Sustainable waste management through reduction, reuse and recycling and the use of appropriate technologies, facilities, and equipment to provide a

sustainable and comprehensive solid waste management service”. The Action Plan, which was prepared as a guide to the Government of Malaysia and the relevant stakeholders in implementing NSP, recommends “Formulation of the Master Plan for the 3Rs”, “Development of Legal Framework for 3Rs”, ”Development of SWM facilities that support 3Rs” and “Implementation of the Master Plan”. This WM-M/P fulfils the NSP recommendations on preparing the master plan for 3Rs.

WM-M/P formulated within the framework of NSP is shown in Figure 2.2 below.

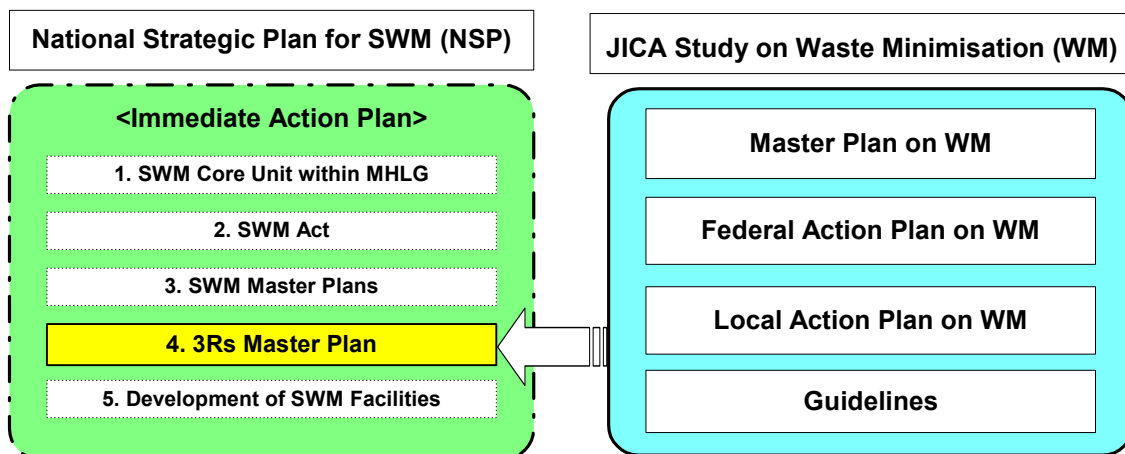


Figure 2.2 WM-M/P within the Framework of National Strategic Plan for Solid Waste Management

Following the adoption of NSP, MHLG is now in the final stage of formulating the Solid Waste Management Act (SWM Act). The SWM Act is now under examination by the relevant ministries, agencies and other stakeholders. The SWM Act will have some basic provisions regarding promotion of waste minimisation through 3Rs activities.

2.3 CURRENT ISSUES ON WASTE MINIMISATION

2.3.1 Appreciation of the Current SWM

(1) Current SWM Service Providers

In Malaysia, municipal solid wastes from households, business entities and institutions are managed under the responsibility of LAs while industrial process waste and construction/demolition waste are managed by the private waste management service contractors. Presently, approximately 95 - 97% of wastes collected in Peninsular Malaysia are brought for final disposal at landfills while the remaining 3 to 5% are diverted to recyclers/re-processors and/or self treated.

(2) Current Recycling Mechanism

At present, there are two main routes for recyclables collection: one is through buy-back and/or collection centres set up by LAs, concessionaires, NGOs and private organisations, and the other is by private collectors of recyclable materials. In either way, the collected recyclable materials are then sold to recycling factories or intermediate buyers. Such intermediate buyers also export a considerable amount of recyclable materials to other countries. Waste separation at source is limited to a number of areas under the various pilot projects.

(3) Recycling of Major Recyclable Items

Table 2.1 describes the major recyclable items in terms of their respective share of the waste composition, estimated recycling rates and general conditions of their market demand.

Table 2.1 Major Recyclable Items from Municipal Waste

Item	Share of waste composition (%)	Estimated recycling rate (%)	Remarks
1) Food waste	49.3%	4.5%	<ul style="list-style-type: none"> Composting of food waste is not employed at a large scale
2) Paper	17.1%		<ul style="list-style-type: none"> Waste paper for recycling is mostly collected from generation source after separation Source separation is limited to certain paper categories that have high market value
3) Plastics	9.7%		<ul style="list-style-type: none"> Waste plastics actively collected for recycling include PET bottles, HDPE, PE, PP, etc. Source separation is limited due to comparatively lower price compared to waste paper and metal
4) Glass	3.7%		<ul style="list-style-type: none"> Waste glass recycled includes glass bottles, jars and coloured or clear glass. Source separation is low Limited number of glass bottle manufacturers in Malaysia generates low demand Bottles reuse market exists
5) Ferrous metal	1.6%		<ul style="list-style-type: none"> Wide range of ferrous metal recyclables in the local market Source separation and direct selling is high
6) Aluminium	0.4%		<ul style="list-style-type: none"> Source separation and direct selling is high due to high selling price

Source: JICA Study Team

2.3.2 Major Issues on Current Waste Minimisation Activities

(1) Increase in Solid Waste Amount and SWM Cost

In 2004 an estimated 8.7 million tons of municipal waste was generated. Barring any improvement in waste minimisation and considering the projected population and economic growth, the waste amount in 2020 is expected to reach 15.7 million tons.

In terms of cost for SWM, presently RM 860 million is spent annually, only for final disposal of waste, and this is estimated to almost double to RM 1.6 billion by 2020, unless urgent measures are taken to reduce the disposed waste amounts.

(2) Lack of Basic Data on SWM and recycling

The government is largely dependent on the concessionaires and LAs for the solid waste management database. Waste generation and composition surveys are implemented on an ad-hoc basis and are not standardised. In particular, the data on solid waste generated from industries and construction/demolition activities is very limited.

As to the data on waste minimisation and recycling, the government currently relies on information provided by the LAs participating in the National Recycling Programme (NRP). However, the data provided by the LAs widely varies in terms of accuracy and uniformity.

Proper identification of current SWM and recycling conditions based on an accurate database is one of the most important issues to address for planning a sustainable SWM.

(3) Lack of Awareness on Waste Minimisation

Although MHLG has been making efforts to raise awareness on recycling, the change in the behaviour of the general public towards recycling is still too slow. The general public are mostly interested only in source separation and selling of recyclables that fetch high prices.

Awareness raising programme has to focus on the necessity of waste minimisation in terms of resource scarcity and possible serious consequence of increasing waste generation and disposal that will increase the cost of social overhead capitals and finally the living cost of the people.

(4) Lack of Policies to Promote Waste Minimisation

Formulation of the basic policy on waste minimisation is the primary task of the government to officially declare and show its vision and intent of realising a society in future with minimised waste and burden to human health and environment.

(5) Limited Information and Linkage among the Stakeholders

A large number of players are involved in recycling: the waste generators, collection service providers, waste pickers, traders, recycling centre operators, NGOs, and end-users to mention a few.

Proper networking and linkage amongst these players will contribute not only to increase efficiency of recyclables collection, but also to create new opportunities of recycling based on partnership among stakeholders. Such partnership is of great importance to realise the potential for recycling in Malaysia.

2.4 STUDY OUTPUTS

The Waste Minimisation Master Plan (WM-M/P) is prepared as shown in the flow in the following Figure 2.3 with the target year of 2020. The Master Plan sets out the strategies for attaining the required objectives and provides conceptual tasks to implement each strategy. Pilot Projects were implemented on the basis of some of these strategies.

Out of these tasks, some of those with urgent priority and that are achievable within a short term have been developed as Action Plans (A/Ps). More detailed programmes have been developed for these Action Plans in order to meet their target year set for 2010.

Finally, in order to prepare the detailed programmes for implementing some of the identified actions, Guidelines have also been prepared for this purpose.

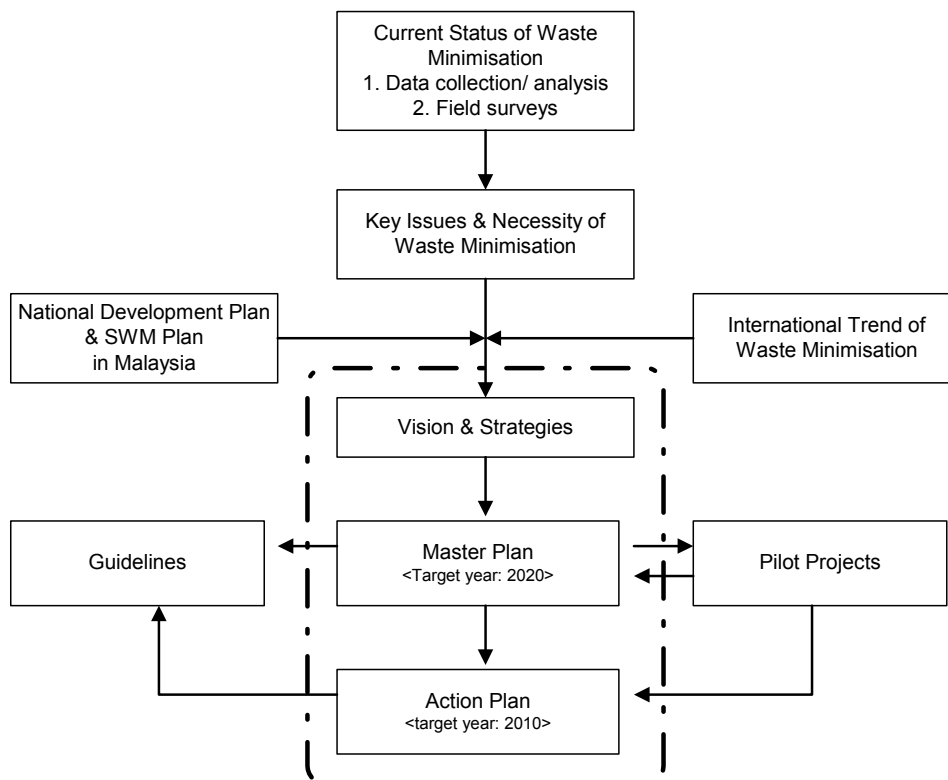


Figure 2.3 Study Flow and Output

3. MASTER PLAN FOR WASTE MINIMISATION

The WM-M/P has been formulated considering the national objectives of environmental conservation and in line with the National Strategic Plan on SWM (NSP). The WM-M/P deals with the issues that are considered to be obstacles in the implementation of waste minimisation.

3.1 OBJECTIVES AND SCOPE OF THE MASTER PLAN

3.1.1 Objective

The objective of the WM-M/P is to provide Vision, Strategies and Roles of Stakeholders to minimise the amount of solid waste disposed in Malaysia. The WM-M/P embodies the National Strategic Plan for Solid Waste Management (NSP).

3.1.2 Target Waste

Taking into account current definitions and allocation of responsibilities for SWM in Malaysia, the WM-M/P covers the following types of solid wastes:

- Household waste
- Commercial waste
- Institutional waste
- Industrial waste
- Construction waste.

Among these waste types, the WM-M/P will mainly focus on the household, commercial (offices, restaurants, hotels, commercial and service establishments, markets, etc.), institutional, and non-processed industrial wastes, considering the similarity in nature and composition of these wastes and the urgent need of action to control them. For the other waste types such as processed industrial waste and construction/ demolition waste, the WM-M/P provides some recommendations regarding the institutional mechanism required to control them properly along with the proposed allocation of roles among the relevant government ministries and agencies.

3.1.3 Target Area

The WM-M/P covers Peninsular Malaysia as well as East Malaysia, and applicable to all the States and Federal Territories.

3.1.4 Target Year

The target year of the WM-M/P is set at the year 2020. This is the same target year adopted for the NSP and Vision 2020.

3.2 VISION

To realise *Material Cycle Society*¹, it is of great necessity to reduce waste generation at source, to minimise the amount of waste disposed at landfills and to maximise the efficiency of resource utilisation.

The ultimate vision of the WM-M/P is:

*“To realise a **Material Cycle Society**, where waste minimisation activities are systemised and sufficiently enrooted in the behaviour of government, private sector, and the people in Malaysia”*

¹ The term, “Material Cycle Society” has been developed in the Law for Establishing a Sound Material-Cycle Society, which was enacted in 2000 in Japan, providing basic framework of minimizing the waste through 3Rs (Reduce, Reuse, Recycle) activities. Definition of it is the society where the consumption of natural resources is minimized and the environmental load is reduced as much as possible.

Waste minimisation is represented in the WM-M/P by the efforts of 3 key stakeholders (private sector as the producers and providers of consumer goods, the general public as the consumers, and the government) in the 3Rs (Reduce, Reuse, and Recycle) which is defined below:

- **Reduction at source** is defined as the reduction in the amount of waste that will enter into the waste stream through changes in lifestyle and/or manner of consumption, improvement of manufacturing processes, green purchasing, and so on;
- **Reuse** is defined as the multiple use of a product in its original form, for its original purpose or for an alternative, with or without reconditioning; and
- **Material Recycling (or Recovery)²** is defined as the utilisation of waste for other purposes by processing (including segregation, washing, melting, transforming, etc.), but most of the fractions of waste shall be utilised as materials for other purposes.

Among the 3Rs above, reduction of waste at source must be given the first priority while reuse is subsequently promoted to minimise the waste generation at sources. For the materials that cannot be reduced or reused, material recycling is to be applied to their maximum possibility while the only remaining residue and non-recyclable materials are to be treated (using technology that includes thermal recycling or incineration) and disposed at landfills. The aim of M/P-WM is that all the stakeholders, i.e. general public, business and government, understand the principles of 3Rs and put them into practice by the year 2020. The NSP has set the target rate for waste recovery and reduction at 22% by the year 2020. Implementation of this WM-M/P is expected to greatly contribute towards realising this target.

3.3 STRATEGIES

3.3.1 Outline

Based on an appreciation of current issues and to realise the vision and achieve the set target, strategies should be established considering the need for:

1. A deeply rooted *awareness* within the Malaysian society on the importance of waste minimisation;
2. A mechanism of waste minimisation based on the *partnership* of government, private sector, and general public and participation of every stakeholder within the society;
3. Proper recognition and practice of waste minimisation sustained by market mechanism with *government involvement* in the development of the environment that encourages all participants to implement the 3Rs (Reduce, Reuse, and Recycle); and
4. Practice of waste minimisation in accordance with the hierarchy of 3Rs.

Understanding and cooperation of the general public is the foundation of promoting waste minimisation in the whole society. In this regard, awareness of general public is of the most importance to promote waste minimisation.

3Rs activities can only be promoted and sustained provided the general public fully comprehends the need and urgency for waste minimisation. In instances where the materials that have not enough value to recycle on the current market mechanism, the voluntary efforts of relevant stakeholders are key to waste minimisation through material recycling. Reduction and reuse of materials also strongly depends upon the voluntary efforts of every stakeholder as waste generators.

² For the 3rd “R”, the term “Recycle” is used in this Study, whereas in the NSP, the term “Recovery” is used to. Both terms are considered to have the same meaning here.

The promotion of 3Rs activities is very much dependent upon the government. It needs to send a strong message to the general public, private sector and other stakeholders on the current issues of waste management and the necessity for waste minimisation. Understanding and support of the general public is essential for the government to formulate and implement the policies to promote waste minimisation.

Waste minimisation will only be achieved through realisation of 3Rs activities by all the stakeholders based on the real understanding of its necessity and support to the government policies.

Thus, the WM-M/P sets the following strategic targets to promote waste minimisation in Malaysia.

- **Enhancement of Awareness on Waste Minimisation (Awareness)**
- **Strengthening of Partnership for 3Rs Activities (Partnership)**
- **Enhancement of Institution to Strengthen Government Policies on Waste Minimisation**

These strategic targets will only be achieved through partnership among the key stakeholders, namely the government³, the private sector⁴, and the general public⁵, all of whom need to understand and appreciate the necessity of waste minimisation, as shown in Figure 3.1.

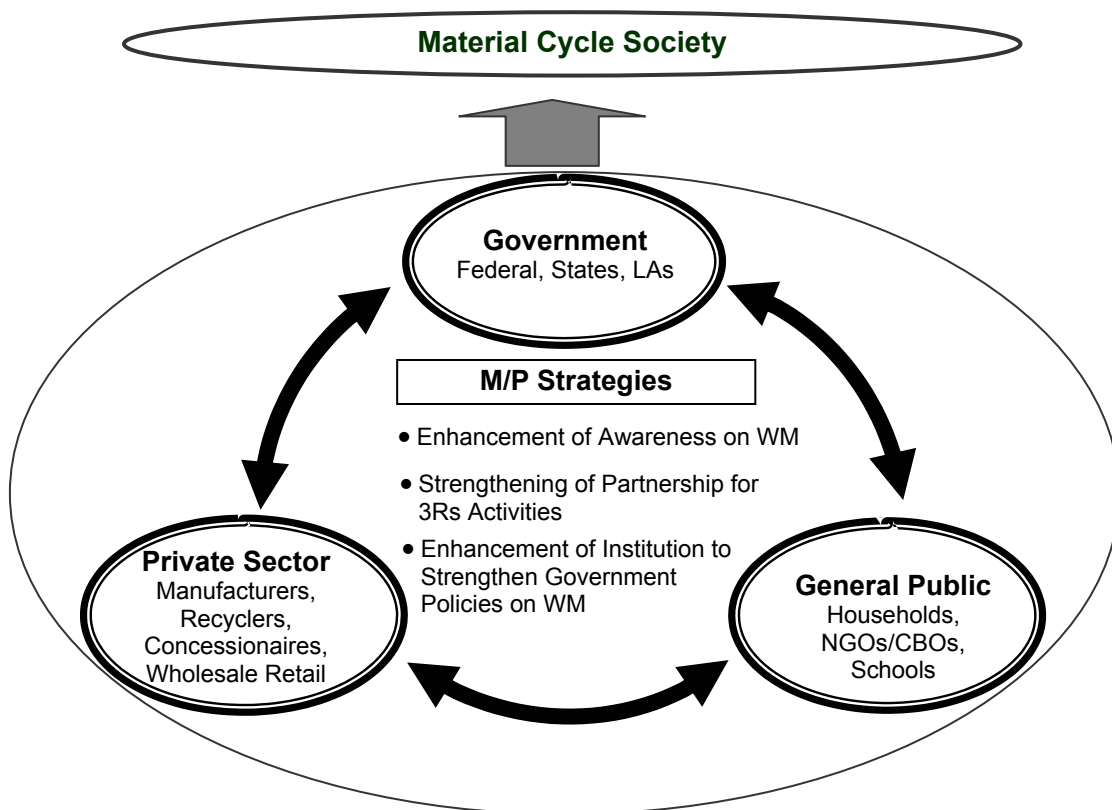


Figure 3.1 Three Key Stakeholders and Strategies for Waste Minimisation

³ Government includes the three levels of Federal, State and Local Governments

⁴ Private sector includes manufacturers, recyclers, service providers (including concessionaries), wholesale and retailers, etc.

⁵ General public includes households, NGOs/CBOs, schools, etc.

Facilities such as recycling centres and materials recovery facilities (MRFs) are also required for the 3Rs activities. The Government has authorised the NSP to incorporate in the study the development of the required MRFs within the country. Accordingly, strategy for the development of MRF facilities has not been included in this WM-M/P.

3.3.2 Strategy 1: Enhancement of Awareness on Waste Minimisation

(1) Goal

All stakeholders have a proper understanding of waste minimisation.

(2) Why the Public Awareness Raising Needed

The concept of “reduce, reuse and recycle” is relatively new in the agenda of the Malaysian economy and general public. Indeed, to change the behaviour of the general public, the private sector and government and to generate more consciousness amongst these stakeholders is critical. Also, 3Rs is related to a series of activities that include purchasing, use, repairing, disposing the waste at designated places, discharging waste outside, collecting waste, separating items can be reused or recycled and so on. Public awareness raising and the practice of the 3Rs shall involve all members of the community.

It is necessary to deepen the understanding of the public on the importance, meaning and the practices related to the 3Rs. Public awareness campaign shall be implemented in a comprehensive manner to cover all sectors of society in order to produce the desired effect, that is, changing the behaviour of the general public to support 3Rs in the homes, working places, companies, shops, factories, schools, and the like. Every stakeholder shall be made aware of the required behaviour towards waste minimisation behaviour and the respective 3Rs.

The general public should make greater effort to *reduce* waste generation during and after consumption of products through such activities as green purchasing⁶ or carrying their own bags during shopping. *Reuse* of goods by buying refurbished second hand goods, reusing packaging materials and containers, and buying reusable and refillable goods are examples of required behaviour. The public can also actively support *recycling* through separation of valuables from the waste, bringing these materials to recycling centres, and actively participating in the recycling activities of NGOs and CBOs.

The private sector should also be made aware of waste minimisation behaviour. Product design, production lines, packaging, and transport activities should all be developed with an eye on *reducing* the waste generation during these activities. This sector should promote the system for return of the reusable materials and their *reuse* in the production process. Research and development of *recycling* technologies and developing industries recycling potential should be encouraged by the private sector.

The government also needs to be aware of the important roles it has to play towards waste minimisation. These include promoting awareness on waste minimisation behaviour; developing the legal, institutional and policy frames to support efforts in waste minimisation; and promoting optimum and cost-effective mechanisms for waste minimisation.

(3) Approach for Enhancement of Awareness by Each Targeted Stakeholders

To raise awareness on WM among the target stakeholders, the government in cooperation with the relevant stakeholders, should conduct a series of awareness raising activities including public relations, demonstration, and so forth.

⁶ Choosing less waste generating products, long-life products, non-disposable and refillable products, etc. are examples of green purchasing.

1) Raising Awareness of General Public on WM

Taking into account the difficulty of changing the conventionalised behaviour of adults, awareness raising activities shall focus on the younger generation including school children. Children can also influence the awareness and behaviour of adults. In this regard, the mind-set and behaviour of younger people may have a great influence on the general public.

To raise awareness of young generation on 3Rs, education in school and participation in the community activities are good opportunities. 3Rs education in school and community-based 3Rs activities are of great importance in this respect.

The government must promote through public campaigns participation of young generation in 3Rs activities. These may include source separation of recyclable materials led by residential associations, communities and NGOs.

The government must also strongly call on family level participation in such activities so that the younger generation and adults can learn together the importance of waste minimisation. Cooperation from the government, RAs, communities and NGOs are also important to encourage participation of general public in 3Rs activities.

2) Raising Awareness of Business Entities on WM

The actions to be taken for raising awareness of business entities on WM include waste minimisation through the introduction of cleaner production, maximised utilisation of recyclable raw materials for production, non or reduced use of packaging and container materials in the manufacturing and distribution of products, voluntary collection of used or consumed products through cooperation among manufacturers, distributors, and retailers. To promote these activities, awareness raising and participation of corporate managers in 3Rs activities are of great importance.

3) Awareness Raising of the Government on WM

Within the government sector, raising awareness should focus on the local government, who is responsible for proper municipal solid waste management. Reduction of waste disposal landfill is also one of the mandates of local government as the municipal waste management service provider.

In this respect, the national government shall inform the top administrators of local governments the national policies on waste minimisation and guide them to implement collection of recyclable materials based on separation at sources and organise general public, businesses, RAs, NGOs, and other relevant stakeholders to promote 3Rs activities in their localities.

To raise the awareness of top administrators of local governments, the national government shall also establish the awards of local governments that achieve the best performance of 3Rs activities, as well as disclose the information of the efforts of local governments to the general public.

(4) The Leaders of Awareness Raising

In promoting the 3Rs activities among the key stakeholders, raising the awareness of leaders and leading organisations within the community, locality, business community, and NGOs are of great importance. These leaders and leading organisations are the champions of waste minimisation who may have a relatively higher consciousness towards waste minimisation and who may have already put that awareness into practice. To increase the quantum of such leaders and leading organisations, the government needs to establish the opportunities of

awarding them as well as facilities or avenues for them to exchange information and experience amongst themselves and to provide more information on 3Rs activities through seminars and workshops.

Table 3.1 shows the examples of such leaders and leading organisations with their possible roles in leading 3Rs activities.

Table 3.1 Key-personnel/ Organisation Leading Awareness Raising Activities

Key personnel/ organisation	Description
1. Community leader/ local champion	Awareness raising actions shall be preferably led by the community leaders and/or local champions who are really willing to carry out the actions, and with the leadership of the LA where such community leaders are not found.
2. Business / industry associations	The business and industrial associations are the best focal points for initiating awareness raising actions towards business entities. In Japan, such associations in many cases promote the initiative for 3Rs in the business entities and the achievement of member entities are periodically reported, compiled and publicised by them. Announcement of the activities in relation to 3Rs provides good publicity for the business entities in Japan.
3. Top management	To enroot 3Rs activities into each employee of business entities, a decision by top management to participate in the 3Rs actions is essential. In this regard, involvement of top management of business entities in planning the awareness raising actions is of great importance since this kind of top-down Task works efficiently to disseminate the awareness of 3Rs among the employees.
4. Schools	Schools have an important role in enhancement and implementing of waste minimisation activities. Waste minimisation practices and habits should be inculcated into the younger generation via their co-curricular activities. In the process, the children will indirectly educate their parents and siblings as well. Also, the schoolteachers' capacity will be developed.

(5) Raising Awareness Through Mass Media

Although public campaign through mass media such as newspapers and TVs is one of effective methods to raise awareness of general public, it is usually regarded as a one-way flow of message to the users.

To increase public awareness of 3Rs activities, active participation and feedback of readers and viewers of the media is required. The tactic of sending messages to the public shall also be accompanied by a means for them to reciprocate or provide feedback. The media need to establish a platform, such as the website, for information exchange and discussion. Indeed, access to the Internet might encourage the public to participate more freely in discussions on 3Rs.

Aside from the use of mass media, the open forums and public dialogue meetings at local level are also good opportunities for the public to openly discuss the issues of solid waste management and 3R activities. The roles of local champions and leading organisations are essential to make such occasions into success in promoting 3R activities at local level.

3.3.3 Strategy 2: Strengthening of Partnership for 3Rs Activities

(1) Goal

As a cost-efficient measure of waste minimisation, the M/P shall give priority to reduction at source and reuse. Awareness of stakeholders is key to the promotion of reduction at sources and reuse of waste.

Reduction of waste at sources mainly consists of:

- Green purchasing
- Use of less packaging

Reuse includes:

- Utilisation of reusable and refillable packages and containers
- Usage of re-built parts and second-hand goods

Material Recycling is the action of returning the used/consumed materials to the production process as recyclables instead of disposing them as waste. Although the effect of material recycling upon waste minimisation is strong, it is difficult to sustain if the materials have enough value to trade in the market. Material recycling mainly consists of:

- Promotion for source separation
- Collection of recyclables before being discarded as waste
- Collection of recyclables after being discarded as waste

As these 3R activities cannot be carried out by the efforts of single stakeholder, building of partnership among the stakeholders in nationwide is the goal of this strategy.

(2) Why Partnership Needed

To effectively implement 3R activities, partnership among the stakeholders is essential. The linkage between separation of recyclables at sources, collection of recyclables, and use of recyclables by end-users cannot be built by a single stakeholder. Indeed, it requires integrated networking and partnership amongst all stakeholders concerned.

For example, reduction on the use of packaging and containers can only be realised based on the partnership among the manufacturers, distributors and consumers of relevant goods.

Reuse of materials by consumers also has limitation if every consumer carries out such efforts only individually. The possibility of reuse is extended if reuse of materials is carried out involving various consumers. To achieve exchange of used materials, the place and opportunity to exchange reusable goods need to be established in partnership with the relevant stakeholders.

Partnership among stakeholders is also indispensable to build proper recycling system. To recycle used materials, waste generators, collectors, recyclers, and users of recycled materials must have proper linkages to close the loop of recycling.

Recyclables materials are required to be properly segregated at sources to maintain its quality as raw materials while the recyclers must process the collected materials to the raw materials in accordance with the quality requirement by their end-users.

Thus, the partnership among stakeholders is the foundation of promoting 3R activities.

(3) Partnership to be Built to Promote 3R Activities

1) Necessity of Partnership for 3Rs

a. For reduce

The effect of waste reduction at sources has its limit if the relevant stakeholders carry out such efforts only individually. However, under the partnership and cooperation with each stakeholder involved in the process from manufacturing the goods to their consumption and disposal, reduction of waste can be achieved on a much larger and extensive scale.

A typical example of such collaboration is seen in the efforts of reducing packaging and container waste. To reduce generation of packaging and container waste at sources, the consumers' strong refusal to excessive packaging of goods and use of containers is required in their behaviour of choosing and purchasing goods. On the other hand, the manufacturers and wholesalers are also required to provide the consumers with the goods of no or less packaging and containers to meet the need of consumers. The awareness of manufacturers, distributors, and consumers needs to be synchronised with each other towards reduction of packaging and containers waste.

b. For reuse and recycle

To promote reuse and recycling, proper coordination and linkage is required throughout the entire process consisting of separation of reusable/recyclable materials at sources, establishment of collection points, transportation by collectors, reuse and/or recycling of collected materials to manufacture the goods. The recycling system becomes sustainable only if the above process and linkage is properly built and sustained in accordance with the required conditions of every stakeholder involved in the process. In this regard, the system needs to be continuously supervised and maintained by the external promoters of 3R activities such as the government and NGOs.

2) Partnership Building

a. Partnership building within the stakeholders

Partnership building amongst the stakeholders shall be promoted. Activities that may be implemented in this regard are as follows:

- *Partnership within relevant NGOs*
 - *Exchange of information among the NGOs conducting 3R activities at local level to further raise awareness between each other.*
 - *Cooperation between NGOs to dialogue with the government for the promotion of waste minimisation*
- *Partnership within the recycling industry*
 - *Exchange of information among recycling industries*
 - *Standardisation of recyclable materials*
 - *Data management on recyclable materials*
 - *Dialogue with the Government*
 - *Awareness raising among the recyclers*
- *Inter-ministerial/agency partnership*
 - *Formulation and implementation of guidelines to reduce waste generated from government buildings and facilities to show the government as an 3Rs initiator and practitioner*

- *Formulation and implementation of guidelines for green purchasing to show government initiative in implementing its strategies.*
- *Inter-governmental partnership at local level*
Establish inter-local council for WM to carry out:
 - *Exchange of information among LAs*
 - *Dialogue with the national government*
 - *Awareness raising of general public*
 - *Capacity building of the LAs that are behind others in terms of WM activities.*
- *Partnership within business entities*
Establish the 3Rs forum among the business entities active in 3Rs activities to carry out:
 - *Awareness raising of general public*
 - *Policy dialogue on waste minimisation*
 - *Promotion of 3Rs activities among private sector*
 - *Formulation of WM plan in businesses*

b. Partnership between the key stakeholders and other stakeholders

Partnership between the key stakeholders and other stakeholders shall be developed. NGOs and CBOs currently play important roles not only in training and educating the general public and business entities but practicing 3Rs activities as well. They also organise and motivate the communities and residents to conduct 3Rs activities including collection of recyclables, and operation of buy-back/drop-off centres. The partnership with NGOs and CBOs is indispensable especially in their role as promoters of grass-root 3Rs activities among the general public.

Table 3.2 Partnership Building among Key Stakeholders

Key Partners	Description
General Public with Residential Associations/ NGOs	<ul style="list-style-type: none"> ▪ Support of community-based 3Rs activities by RAs and NGOs ▪ Active participation by general public in the 3Rs activities organised by RAs and NGOs
Residential Associations/NGOs With recycling players	<ul style="list-style-type: none"> ▪ Support by recycling players in managing and maintaining the collection points of recyclables (buy-back and drop-off centres) ▪ Support by recycling players in collecting the recyclable materials from the collection points established by RAs and NGOs.
LAs with Residential Associations/NGOs	<ul style="list-style-type: none"> ▪ LAs support for 3Rs activities by RAs and NGOs through awareness raising campaigns, establishment of collection points for recyclables, involvement of recyclers in the activities ▪ Active participation and cooperation by RAs and NGOs in the 3Rs activities promoted by LAs
Manufacturers with general publics (consumers)	<ul style="list-style-type: none"> ▪ Providing information from manufacturers to general public on the recyclables (instruction on how to recycle and how to discard the used products) ▪ Labelling on the recyclable products by manufacturers
Companies with industrial associations	<ul style="list-style-type: none"> ▪ Support by industrial associations for the 3Rs activities by individual business entities. ▪ Active participation and sponsoring by individual business entities in the 3Rs activities led by industrial and business associations

(4) Focus of Partnership Strengthening

Strengthening the partnership among stakeholders to promote 3Rs shall focus on the following points:

- Partnership building through implementation of pilot 3Rs activities
Pilot 3Rs activities are promoted for the purpose of identifying the potential 3Rs activities and participants in the localities. Based on the evaluation of such pilot activities, the direction of strengthening the partnership will be identified at local level.
- Identification of leaders and leading organisations for promoting 3Rs
Identification of leaders and leading organisations are the key to establishment of partnership among the stakeholders. Partnership building shall be promoted under the initiative of such leaders and leading organisations.

3.3.4 Strategy 3: Enhancement of Institution to Strengthen Government Policies on Waste Minimisation

(1) Goal

The mind-set and partnership of stakeholders need to be supported by the establishment of appropriate legal/regulatory, incentive, and institutional mechanisms. In this respect, the Master Plan addresses the concept of the establishment of the basic framework for laws/regulations, incentives, and institutional mechanisms. The strategy for the establishment of such a framework is as follows.

Strategy 3-1: Establishment of Legal and Regulatory Framework

Strategy 3-2: Strengthening of Financial and Economic Incentive

Strategy 3-3: Capacity Development of the Government Sector

(2) Strategy 3-1: Establishment of the Legal and Regulatory Framework

1) Why the Legal and Regulatory Framework is Needed

As long as solid waste can be disposed easily at lower cost, motivation to waste minimisation will remain low among the waste generators. In this regard, the legal framework for solid waste management needs to be built to properly control construction of treatment and disposal facilities of solid waste. It is also necessary to establish the national policy clearly stating the intent of the government to minimise the disposal of waste at landfills through waste minimisation.

With regard to waste minimisation, the roles and responsibilities of stakeholders and economic incentives also need to be legally provided by the relevant laws.

2) Legal and Regulatory Framework

Laws and regulations required for promoting waste minimisation are:

- a. Solid Waste Management Act, as the foundation of defining waste minimisation activities
 - b. National Waste Minimisation Master Plan and Action Plan
 - c. Local by-laws on solid waste management and waste minimisation
 - d. Relevant laws and regulation to promote recycling
- a. Solid Waste Management Act as the legal foundation

The Federal Government is currently in the process of preparing the Solid Waste Management Act (SWM Act), which will provide the basic principle of overall solid waste management in Malaysia. Therefore, the Solid Waste Management Act will be the legal foundation of all relevant activities in relation to SWM including waste minimisation

to be supported by, and be compatible with the SWM Act. Although general provisions regarding waste minimisation are to be determined in the SWM Act, detailed rules, regulations, and plans are required to be formulated.

If regulatory measures on 3Rs are provided, rules and under the act should clarify roles, mandates and sanctions of concerned players.

The mandates of national and local governments have to be clearly provided in the Act. The mandates of the national government shall include policy formulation on waste minimisation, provision of information, technological development and economic incentives for promoting recycling, capacity development of local government, and so forth.

The mandates of local government may shall include proper management of solid waste and waste minimisation at local level, and guide general public and businesses to participate in waste minimisation activities.

b. National Waste Minimisation Master Plan and Action Plan

The Master Plan on Waste Minimisation provides vision and strategies, while the Action Plan provides activities to drive 3Rs and supports the legal measures.

c. Local by-laws on solid waste management and waste minimisation

Considering the difference in scale of economy, socio-cultural background, locally available technologies and human resources for 3Rs activities, the Master Plan adopts the strategy that detailed rules and regulations on waste minimisation are to be determined at the local levels. The local-based approach to be embodied in the “Local Action Plan on Waste Minimisation” and institutionalised into State/Local by-laws.

Taking into account the difference in current conditions of waste minimisation as well as available resources, detailed rules, regulations and plans are to be prepared under the initiative of state and/or LAs. As to the rules and regulations, the state/local authorities can utilise existing by-laws in relation to waste management such as anti-littering by-laws, solid waste management by-laws.

d. Relevant laws and regulations to promote recycling

Although voluntary partnership among the stakeholders is the basis of waste minimisation to be provided in the SWM Act, the government may face difficulty in promoting WM for some materials. In such a case, specific laws and/or regulations shall be examined to promote WM of such materials. Laws and regulations on green purchasing and introduction of Extended Producers Responsibility (EPR) are such legal/regulatory options among others.

(3) Strategy 3-2: Strengthening of Financial and Economic Incentives

1) Why Incentives Are Needed

The market supports the active recycling of some items of value, such as used paper and aluminium cans. On the other hand, the low market values and fluctuations in prices for used glass bottles and plastic wastes tend to discourage active recycling of these items.

Incentives are proposed in order to stabilise and further enhance recycling activities in Malaysia. These incentives need to focus on strengthening the domestic market and domestic recyclers and manufactures.

2) Incentives to support 3Rs Activities

In principle the WM-M/P proposes two directions for developing the incentives:

- The disbursement of funds to LAs as financial support for waste minimisation activities
- Development of economic incentives to support waste reduction and recycling activities

(4) Strategy 3-3: Capacity Development of the Government Sector

1) Why Capacity Development Is Needed

Under the policy of federalisation of SWM and as stated in the RM-9, GOM has decided to establish a Solid Waste Management Department (SWMD) at the Federal Government level to oversee SWM. It is therefore expected that the Federal Government will play a pivotal role in waste minimisation in the future.

The GOM related officials have been developing their skills in many fields of SWM; however, more capacity development is required in the field of waste minimisation and specifically to successfully implement the action plans.

2) Focus of the Capacity Development

Capacity development will focus on information management as well as development and implementation of LA plans on waste minimisation.

3) Applications

This strategy proposes developing the government sector capacity for maintaining the Information Management System (IMS) and preparing the LAP-WM.

a. Improvement of Information Management

The WM-M/P defines the Federal Government as the focal point of all information and data on waste minimisation so that it can always identify the current SWM situation. Whereas the Ministry of Natural Resources and Environment (MONRE) already has its own database built on collected data from generators, collectors, and treatment providers of scheduled waste, MHLG is presently preparing to establish the so-called Recycling Information Centre (RIC) within MHLG. The RIC is to take the main role in information/data management and analysis in relation to waste minimisation activities of municipal solid waste. The LAs on the other hand have the main role to collect the data and ensure that it is accurate as much as possible. Therefore capacity development for both the RIC and the LAs to maintain the IMS is very important.

Furthermore, RIC is developed not only as the focal point of information and data on waste minimisation, but also as the centre for the following functions in relation to waste minimisation:

- Referral centre for 3Rs players, technologies, and products
- Services for 3Rs business match-making
- Information support services for 3Rs players

The schematic diagram of the RIC in the WM-M/P is illustrated in Figure 3.2.

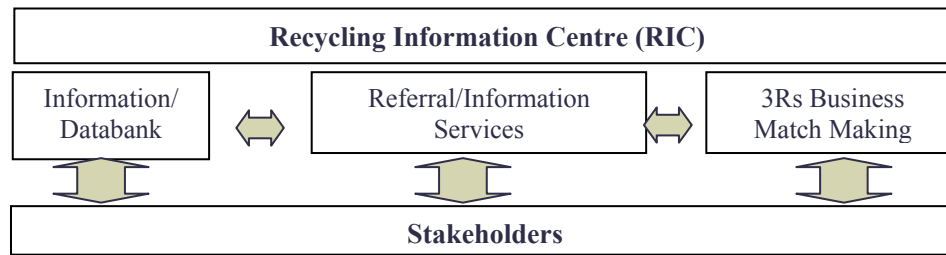


Figure 3.2 Schematic Diagram of RIC in the Master Plan

b. Formulation of Local Action Plan on Waste Minimisation

The LAP-WM is to be formulated in accordance with the “Guidelines for Formulation of Local Action Plan for Waste Minimisation” (refer to Volume II of this Report).

3.4 ROLES OF STAKEHOLDERS

The WM-M/P strategies need to be implemented by the three key stakeholders, the general public, the government and the private sector. The WM-M/P strategies identify the responsibility and roles of the stakeholders.

(1) General Public

- Refusing waste as conscious consumer
 - Returning to the retailers of the packaging and containers that immediately becomes solid waste (e.g. plastic bags, food trays)
- Reducing waste as waste generator
 - Segregation of recyclable materials at sources in accordance with the recycling mechanism applied in its locality.
 - Reducing waste by composting etc,

(2) NGOs, CBOs and RAs

- Bridging community with the relevant stakeholders
 - Organising LAs, recyclers, haulers, and end-users of recyclables to support community-based 3Rs activities.
 - Providing information on relevant stakeholders
- Leading role in awareness raising and organising communities for 3Rs such as proper source segregation of recyclable materials
 - Awareness raising of general public on 3Rs
 - Organising 3Rs activities including source separation of recyclables at community level

(3) Government

1) Federal Government

- Formulation and promulgation of the basic policy on national waste minimisation such as legal and economic instruments
- Promoting and supervising roles through information/data collection and management
- Provision of incentives to promote 3Rs activities by stakeholders.

2) State Government/Local Authority

- Focal point on information, that is, collection of data and information on SWM and 3Rs
- Formulation of Local Action Plans on waste minimisation
- Policy implementation through Local Action Plans on waste minimisation and their implementation
- Coordination among relevant stakeholders in establishing and maintaining the recycling system in its locality
- Creation of opportunities for exchange of information among the LAs
- Joint implementation of awareness raising activities of general public with LAs
- Private Sector & Institutions

(4) Private Sector & Institutions

1) Business Entities

- Refusing waste by proper purchase
- Reducing waste as waste generator by cleaner production
- Recycling partner by Segregation of recyclable materials at sources in accordance with the recycling mechanism applied in its locality
- Sharing information and raising awareness on 3Rs through its network such as business association, especially for SMEs

2) Producer and Retailer

- Promoting the use of reusable/refillable containers
- Promoting voluntary taking-back of packages and containers based on EPR
- Provision of product information that are useful for reuse and recycling
- Design and manufacturing of eco-friendly products
- Establishment of the organisation to certify eco-friendly products
- Creation of the opportunity to provide information of 3Rs

3) Concessionaires

As the organisation responsible for waste management at the local level, concessionaires shall have the following roles:

- Establishment of their own recycling system as waste management player
- Sharing information and raising awareness on 3Rs

4) Recycling players

Collectors and recyclers of materials play significant roles in maintaining the recycling system in their service areas and localities. They need to play the following roles at the local level recycling activities.

- Cooperation in community-based collection of recyclable materials based on separation at sources
- Registration as recyclers, if required by legislation

5) End Users

The loop of recycling is closed when the collected recyclable materials are used for manufacturing the recycled products. This, the role of end-users of recyclables is importance. To cooperate in the implementation of the national waste minimisation policies and promote recycling, the following roles are to be taken by end users:

- Efforts of receiving and utilising recycled materials
- Linkage with recycling players
- Provision of information to general public and awareness raising on recycling
- Awareness raising of general public and businesses especially on separation of recyclables at sources

4. ACTION PLAN AT THE FEDERAL LEVEL

4.1 INTRODUCTION

This Chapter describes the Waste Minimisation Action Plan at the Federal Level that has been prepared in line with the strategies formulated under the Waste Minimisation Master Plan.

4.1.1 Objectives of the Federal Action Plan

The Objectives of the A/P are set as follows:

- To realise the strategies of the Master Plan on National Waste Minimisation by setting priority action.
- To provide recommendations on programmes and actions to be undertaken by the Federal Government.

(Reference)

Strategies of the Master Plan

- *Enhancement of Awareness on Waste Minimisation (Awareness)*
- *Strengthening of Partnership for 3Rs Activities (Partnership)*
- *Enhancement of institution to strengthen government policies on waste minimisation*

The target year of the A/P is set at the year 2010 to be in line with the Ninth Malaysia Plan.

4.1.2 Interfacing of Master Plan and Action Plan

The Waste Minimisation Master Plan (WM-M/P) whose target year is set at 2020, has been prepared to lead the country towards the realisation of an *Environmentally Sustainable Society* based on the concept of 3Rs - Reduce, Reuse and Recycle.

The Action Plan (A/P) whose target year is set at 2010, has been prepared in line with strategies of the WM-M/P. The A/P provides detailed activities with annual time schedules and cost estimates. The A/P is prepared based on the following conditions.

- i. The three components of 3Rs, i.e. Reduce, Reuse and Recycle, are included in the actions.
- ii. Practical actions that take into account current issues on waste minimisation are recommended in the A/P.
- iii. The results and lessons of the pilot projects are reflected in the plans.

The relationship between the Master Plan strategies and the Federal Action Plan is shown in Table 4.1.

Outline of the A/P is shown in Table 4.2.

Table 4.1 Master Plan Strategies and Federal Action Plan

M/P Strategies	Federal Action Plan
Strategy-1: Enhancement of Awareness on Waste Minimisation	Action-1: Enhancement of Awareness Raising Activities under the National Recycling Programme (NRP)
	Action-2: 3R Activities in Schools
Strategy-2: Strengthening of Partnership for 3Rs Activities	Action-3: Formulation of Stakeholders' Networking and Development of Partnership Activities on 3Rs
Strategy-3: Enhancement of Institution to Strengthen Government Policies on Waste Minimisation	Action-4: Strengthening of Legal, Regulatory and Financial Mechanism
	Action-5: Improvement of Information Management
	Action-6: Provision of Guidance to LAs on LAP-WM

Table 4.2 Outline of the Federal Action Plan

Master Plan *1	Action Plan *2		Target/ Performance Indicators	Responsible Agencies	Cost (RM) *3	Schedule				
	Strategies	Actions				Detailed Activities	2006	2007	2008	2009	2010
1. Enhancement of Awareness on Waste Minimisation	Action-1: Enhancement of Awareness Raising Activities under the National Recycling Programme	A1-1: Improvement of the National Recycling Programme	Households interview survey nation-wide to determine extent of strengthened public awareness on 3Rs	MHLG	15,625,000	█ ○			
		A1-2: Implementation of Nation-wide Awareness Campaign on Source Separation		MHLG, LAs		█				
		A1-3: Development and Training of Leaders for Promotion of 3Rs		MHLG, LAs		█				
		A1-4: Promotion of Green Purchasing and Waste Reduction at Source		MHLG, MITI		█				
	Action-2: 3Rs Activities in Schools	A2-1: Dissemination of the "Guidelines for the Enhancement of 3Rs Activities in Schools"	10 LAs & 4 States implement School 3Rs programme	MHLG, MOE	6,640,000	█				
		A2-2: Formulation of Award Programme for 3Rs Activities in Schools		LAs, States		█	.....		
		A2-3: Implementation and Monitoring of 3Rs Activities in Schools		Pupils, Teachers, LAs, States			█			
2. Strengthening of Partnership for 3Rs Activities	Action-3: Formulation of Stakeholders' Networking and Development of Partnership Activities on 3Rs	A3-1: Formulation of National Annual Plan for Organising Stakeholders' Networking and Implementation of Source Separation	Recycling rate reaches 11% in 2010	MHLG	123,075,000	█	.....		
		A3-2: Formulation of Stakeholders' Networking		LAs, Private sectors		█				
		A3-3: Implementation of Pilot 3Rs Activities		LAs, States		█				
		A3-4: Development of Partnership Activities on 3Rs by NGOs/ CBOs		MHLG, LAs, NGOs/CBOs			█			
3. Enhancement of Institution to Strengthen Government Policies on Waste Minimisation	Action-4: Strengthening of Legal, Regulatory and Financial Mechanism	A4-1: Preparation of Rules and Regulations under SWM Act	SWM Act, WM M/P & A/P and By-Law on SWM are authorised and enacted	MHLG, EPU	580,000	█				
		A4-2: Authorisation and Implementation of Waste Minimisation Master Plan		MHLG, EPU		█	.....		
		A4-3: Amendment of By-Law on SWM		MHLG, LAs		█				
		A4-4: Financial Support to LAs for Formulation and Implementation of LAP-WM		MHLG, EPU		█				
	Action-5: Improvement of Information Management	A5-1: Establishment of Information Management System	All LAs participate in IMS	MHLG, LAs, Concessionaires	2,495,000	█				
		A5-2: Implementation and Monitoring of IMS	WMU is established in all LAs	MHLG, LAs, Concessionaires		█				
	Action-6: Provision of Guidance to LAs on LAP-WM	A6-1: Formulation of National Annual Plan for LAPs on Waste Minimisation	All LAs formulate and implement LAP on waste minimisation	MHLG	22,955,000	█ ○	.....		
		A6-2: Dissemination of the Guidelines for Local Action Plan on Waste Minimisation		MHLG		█	.....		
		A6-3: Establishment of Waste Minimisation Unit in LAs		MHLG, LAs		█				
		A6-4: Formulation, Implementation and Monitoring of LAP		MHLG		█				

Note *1 & *2: The M/P provides broad strategies to realise the vision of *Material Cycle Society* up to the year 2020. While, the A/P provides detailed activities targeted to the year 2010.

Note *3: Action Plan costs are basically operating costs, estimated over the 5 year period. Costs include both operating costs to be directly borne by the Federal Government and costs (such as actual collection of separated items, etc.) which should be borne by LAs or Concessionaires, but may be subsidised in part by the Federal Government. Total cost is estimated to RM 171,370,000.

ACTION 1: ENHANCEMENT OF AWARENESS RAISING ACTIVITIES UNDER THE NATIONAL RECYCLING PROGRAMME (NRP)

Objective

To raise public awareness on waste minimisation and to promote the practice of 3Rs

Description of Activities

A1-1: Improvement of the National Recycling Programme

The National Recycling Programme (NRP) should be improved with wider participation of the LAs and other stakeholder partners which include other Government agencies, concessionaires, public sector, NGOs and the like. Nation-wide events and programmes; such as 3Rs award for the best residential association (RA), private companies and/ or schools, should be organised and implemented under the NRP. These events and programmes could culminate in an award-giving ceremony, preferably coinciding with the National Recycling Day (NRD).

A1-2: Implementation of Nation-wide Awareness Campaign on Source Separation

To introduce source separation widely in Malaysia as recommended in Action 3, nation-wide awareness campaign on “*Source Separation*” should be organised and implemented using the mass media (TV, radio and newspaper), re-organising national events, and updating the MHLG website in line with the National Recycling Programme (NRP). Action on source separation is explained in greater depth in Action 3.

A1-3: Development and Training of Leaders for Promotion of 3Rs

Programmes to develop and train leaders for promotion of 3Rs, focusing to community leaders/ local champions, business/ industrial associations etc., should be formulated and implemented by MHLG and/or LAs.

Meanwhile, the exchange of information and experiences on 3Rs amongst community leaders is best carried out periodically through seminars and/or workshops.

A1-4: Promotion of Green Purchasing and Waste Reduction at Source

Periodical campaigns for the promotion of “*Recycled/ Eco-products*” and “*Green Purchase*” should be organised and implemented by using the mass media in line with the NRP. Exhibition and awarding ceremony of recycled/ eco-products should be conducted on special occasions like the National Recycling Day.

Campaigns for waste reduction at source; i.e. carrying own bag during shopping by general public, simplified packaging by manufactures, etc. should be organised and implemented periodically.

Implementation Steps and Schedule

The implementation procedure and schedule are shown in Table 4.3.

Table 4.3 Implementation Steps and Schedule of Action-1

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule				
				2006	2007	2008	2009	2010
A1-1: Improvement of the National Recycling Programme (NRP)								
(1) to examine past activities of the NRP	MHLG	LAs, Concessionaires	---	■				
(2) to strengthen materials, media tools and campaigns	MHLG	States, LAs	MHLG	■	.....	.....	.....	.....
(3) to re-organise the NRP	MHLG	States, LAs, Concessionaires	---	○	■	○	○	○
A1-2: Implementation of Nation-wide Awareness Campaign on Source Separation								
(1) to formulate nation-wide awareness plan on source separation with partners	MHLG	States, LAs, Concessionaires	---	■				
(2) to implement campaign on the TV/radio, newspaper and web-site	MHLG	Private sector	MHLG	■	.....	.....	.....	.....
(3) to implement the source separation by general public (See A3-3)	General public	MHLG, LAs, Concessionaires	MHLG	○	■	○	○	○
A1-3: Development/ Training of Leaders for Promotion of 3Rs								
(1) to formulate and implement the development/ training programme of leaders	MHLG, LAs	LAs. associations	MHLG	○		○	○	○
(2) to conduct seminars/ workshops to exchange information and experiences	MHLG, LAs	LAs. associations	MHLG	○		○	○	○
A1-4: Promotion of Green Purchasing and Waste Reduction at Source								
(1) to promote campaign on green purchasing and waste reduction at source	MHLG	MITI	MHLG	■	.....	.....	.....	.....
(2) to hold exhibition and award ceremony	MHLG	MITI	MHLG	○		○	○	○

ACTION 2: 3Rs ACTIVITIES IN SCHOOLS

Objective

To enhance awareness on 3Rs amongst school children and teachers through 3Rs activities in schools

Description of Action

A2-1: Dissemination of the “Guidelines for the Enhancement of 3Rs Activities in Schools”

The “Guideline for the Enhancement of 3Rs Activities in Schools” should be disseminated nation-wide by both the Ministry of Housing and Local Government (MHLG) and the Ministry of Education (MOE), by publishing and distributing the guidelines and by implementing nation-wide seminars and/or workshops. It is also recommended the Guidelines be updated periodically to take onboard current trends and approaches on the 3Rs.

A2-2: Formulation of Award Programme for 3Rs Activities in Schools

The Award Programme for 3Rs activities in schools should be organised and implemented at the LAs and/or State level. Before the awarding programme can be introduced to participating schools, it is important that a partnership between the Federal and local agencies be formulated – in this instance, between MHLG and MOE at the Federal level and related stakeholders at the local level.

A2-3: Implementation and Monitoring of 3Rs activities in Schools

The 3Rs activities carried out by each school should be decided by each school in line with the guidelines; including source separation of recyclables, poster competition, collection of recyclables, and composting etc. In case source separation and/or collection of recyclables are selected, networking among players; i.e. school, collector/ recycler, concessionaire, end-user, etc., should be established with the leadership of LAs and/or State government. The 3Rs activities of schools should be monitored by LAs and/or State government.

Item	2005	2006	2007	2008	2009	2010
School 3Rs at the LA level				Continue		
MBJB, MBMiri						→
MPSJ, MPPP, MPPJ, MPK, MBKS						→
MDK, MBMB, MP Langkawi						→
School 3Rs at the State level						
Johor						→
DBKL						→
Penang						→
Sarawak						→

Implementation Steps and Schedule

Implementation steps and schedule are shown in Table 4.4

Table 4.4 Implementation Steps and Schedule of Action-2

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule			
				2006	2007	2008	2009	2010
A2-1: Dissemination of the "Guidelines for the Enhancement of 3Rs Activities in Schools"							
(1) to publish and distribute the guidelines to related authorities, agencies, and schools	MHLG, MOE	States, LAs, Concessionaires	MHLG	■			
(2) to implement seminars and/or workshops to explain the guidelines	MHLG, MOE	States, LAs, Concessionaires	MHLG	○	○		
A2-2: Formulation of Award Programme for 3Rs Activities in Schools							
(1) to prepare award programme	MHLG, MOE	States, LAs, Concessionaires	MHLG	■			
(2) to formulate partnership among participating institutions	MHLG, MOE	States, LAs	MHLG	■	.....	.....	.....
(3) to implement the award programme for school 3Rs activities	LAs, States	Concessionaires, NGOs/ CBOs	MHLG, MOE	■	.....	.....	.....
A2-3: Implementation and Monitoring of 3Rs Activities in Schools							
(1) to select schools willing to participate in the award programme	LAs, States	Concessionaires	MHLG, MOE	■	.....	.....	.....
(2) to train school teachers	MHLG, MOE	States, LAs, Concessionaires	MHLG	■	.....	.....	.....
(3) to prepare and implement 3Rs activities by each school	Pupils, Teachers	States, LAs, Concessionaires	MHLG, MOE	■	■	.....	.....
(4) to evaluate 3Rs activities at each school	LAs, States	NGOs/ CBOs	MHLG, MOE	■	■	.....	.....
(5) to hold award ceremony	LAs, States	MHLG, MOE, Concessionaires	MHLG, MOE		○	○	○

ACTION 3: FORMULATION OF STAKEHOLDERS NETWORKING AND DEVELOPMENT OF PARTNERSHIP ACTIVITIES ON 3RS

Objective

To build partnership within and among stakeholders on 3Rs activities through networking on individual activity

Description of Activities

A3-1: Formulation of National Annual Plan for the Establishment of Stakeholders Networking and Implementation of Source Separation

The National Annual Plan for the formulation of stakeholders networking and implementation of source separation should be prepared by MHLG. This is necessary in order to identify the respective LAs and/or States earmarked to introduce these programmes by the year 2010. The LAs and/or States earmarked to participate in the National Annual Plan are listed in Table 5.2.6.

Prior to the implementation of the programme, MHLG should organise a seminar and workshop to guide LAs on the setting up of networking and implementation of source separation.

A3-2: Formulation of Stakeholders Networking

As the first step, a stakeholders' directory should be prepared by the LAs to identify the recycling players in and surrounding the LAs territory. Using the directory as a reference, stakeholders networking can be established in accordance with the process and procedures outlined in the "Recycling Wheel", a booklet written by MPPP in 2001 and used to establish and operate its ongoing recycling programmes. Collection of recyclables and their recovery are presently carried out by the participating agencies of the Recycling Wheel as partnership activities on recycling with waste generators. Outline of the "Recycling Wheel" is shown in *Article 3.2.2, Part 3, Supporting Report-1*.

A3-3: Implementation of Pilot 3Rs Activities

Implementation plans for 3Rs activities should be prepared by LAs in line with the "*Guidelines for Source Separation of MSW*" (refer to *Part III, Volume II*). Target groups should be households, institutions and business entities. Partnership among various stakeholders; i.e. residents/ communities/ institutions/ business entities, recyclers/ concessionaire and end-users should be established beforehand based on the stakeholders networking. The introduction of 3Rs activities within a community is preferably conducted as pilot activities in order to form partnership with performance measurement. These activities can be subsequently expanded based on the review of activities. As a start, Federal financial support for these activities though the LAs is critical.

Types of activities include following;

- 1) Pilot recycling programme jointly by residential associations/NGOs, recyclers or concessionaires with financial support from LAs.
- 2) Pilot waste reduction programme by residential associations, NGOs and shops (shopping mall) with financial support from LAs.

A3-4: Development of Partnership Activities on 3Rs of NGOs/ CBOs

Partnership activities on 3Rs carried out by NGOs/ CBOs, in other words “grass-root 3Rs activities”, such as the operation of buy-back centre, drop-off centre, recycle shop, flea market, charity bazaar, etc. should be promoted by strengthening partnership amongst NGOs/CBOs and the general public, recycling players and LAs. MHLG and LAs should promote these partnerships through the establishment of stakeholders networking and organisation of workshops on 3Rs amongst key-players and/or organisations etc.

Generally, NGOs/ CBOs have the ability to bridge the gap between the public sector and waste generators. As such, it is essential to include NGOs/CBOs as part of the partnership.

Target LAs and State Governments

This programme is to be introduced to the following nine (9) LAs and two (2) States by the year 2010. Other states and LAs who express interest to participate may be included, where possible.

Target LAs/ States	2005	2006	2007	2008	2009	2010
<LAs level>						
MPPP, MPSJ, MB Miri					Continue	
Putrajaya, MPPJ						→
MDKS, MBMB, MBBJ, MBKS						→
Some other LAs						
<State level>						
Penang state, DBKL						

Implementation steps and schedule of Action 3 is shown in Table 4.5.

Table 4.5 Implementation Steps and Schedule of Action-3

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule				
				2006	2007	2008	2009	2010
A3-1: Formulation of National Annual Plan for Stakeholders Networking and Source Separation								
(1) to prepare the National Annual Plan for Stakeholders Networking and Source Separation	MHLG	LAs	MHLG	■				
(2) to implement nation-wide seminars and workshops	MHLG	LAs, MPPP	---	○	○	○	○	○
A3-2: Formulation of Stakeholders Networking								
(1) to establish stakeholders' directory and identify key leaders and leading organisations	LAs		---	■	■	■	■	■
(2) to hold a forum by LAs	LAs	MHLG	MHLG, LAs	■	■	■	■	■
(3) to build partnership among public sector	LAs	MHLG	LAs	■	■	■	■	■
(4) to build partnership among stakeholders	Private sectors	LAs, States, MHLG	LAs, MHLG	■	■	■	■	■
(5) to organise seminar/workshop to guide LAs	LAs	MHLG	LAs, MHLG	○	○	○	○	○
A3-3: Implementation of Pilot 3Rs Activities								
(1) to carry out pilot recycling programme jointly by residential associations/ NGOs, recyclers or concessionaires	LAs	NGOs/CBOs, Concessionaires, recyclers	LAs	■	■	■	■	■
(2) to carry out pilot reduction programme by residential associations, NGOs and shops	NGOs/CBOs, Shops	LAs, Concessionaire	LAs	■	■	■	■	■

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule				
				2006	2007	2008	2009	2010
A3-4: Development of Partnership Activities on 3Rs of NGOs/ CBOs								
(1) to formulate supporting plan of 3Rs activities of NGOs/ CBOs in line with NRP	MHLG	LAs	MHLG					
(2) to conduct workshop to strengthening partnership amongst NGOs/CBOs and other stakeholders	MHLG	LAs	MHLG	○	○	○	○	○
(3) to develop more buy-back centres and drop-off centres in partnership with NGOs/ CBOs	MHLG, LAs	NGOs/CBOs, Concessionaires	MHLG					
(4) to develop recycle shops and facilities in partnership with 3Rs related players	NGOs/CBOs, Private sectors	LAs	LAs					
(5) to organise flea markets and charity bazaars in partnership with 3Rs related players	NGOs/CBOs, Private sectors	LAs	LAs					

ACTION 4: STRENGTHENING OF LEGAL, REGULATORY AND FINANCIAL MECHANISM

Objective

To enact basic solid waste management law, WM-M/P and A/P and By-Laws for the promotion of waste minimisation.

Description of Activities

A4-1: Preparation of Rules and Regulations under SWM Act

The Solid Waste Management Act (SWM Act) is under preparation, and the rules and regulations of the Act should be provided after enactment of Act.

Main items that are covered in the SWM Act and the rules and regulations under SWM Act are attached as Appendix for Action-4.

A4-2: Authorisation and Implementation of Waste Minimization Master Plan

The government in due course may adopt the “WM-M/P and A/P” and its implementation may start immediately thereafter. Initiation of the plan could start with the official launching of 3Rs (Reduce, Reuse and Recycle) in line with the WM-M/P.

A4-3: Amendment of By-Law on Solid Waste Management

In line with the SWM Act and WM-M/P, current By-Laws for solid waste management at the local level should be amended by MHLG. The amended By-Laws on SWM would comprise the following items.

- Adoption of the hierarchy of waste options; i.e. 1st Reduction, 2nd Reuse, 3rd Recovery, 4th Treatment and 5th Disposal (by NSP).
- Preparation and implementation of the Local Action Plan on waste minimisation
- Proper management of waste at generation sources
- Proper collection of solid waste including registration/license for waste collectors
- Proper disposal of solid waste
- Proper recycling of solid waste
- On-site inspection by authorities
- Penal provisions

A4-4: Financial Support to LAs for Formulation and Implementation of LAP-WM

To integrate the current financial support to LAs under NRP into the local action plans (LAP-WM) to be formulated and implemented by LAs, MHLG shall provide financial support to LAs.

MHLG has clarified the criteria for eligibility of grant for NRP. This eligibility may include formulation of local action plan, reporting of waste minimisation activities from LAs to MHLG, arrangement of 3R activities planned including measurement. MHLG may make expand the grant in future.

Implementation steps and schedule are shown in Table 4.6.

Table 4.6 Implementation Steps and Schedule of Action-4

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule				
				2006	2007	2008	2009	2010
A4-1: Preparation of Rules and regulations under SWM Act								
(1) to prepare rules and regulations in line with SWM Act	MHLG	EPU	---					
A4-2: Authorisation and Implementation of Waste Minimisation Master Plan (WM-M/P)								
(1) to carry out necessary procedures to authorise the Waste Minimisation M/P and A/P and enact it	MHLG	EPU	MHLG					
(2) to establish the Inter-Ministerial Committee for the implementation of M/P and A/P	EPU, MHLG	MITI, MOE, MPW, MNRE	---					
(3) to announce the official launching of 3Rs (Reduce, Reuse and Recycle)	MHLG	EPU, States, LAs	---					
(4) to implement the Waste Minimisation Action Plan	MHLG	LAs, States, Private sectors	MHLG					
A4-3: Amendment of By-Law on Solid Waste Management								
(1) to formulate model By-Law on SWM in line with the SWM Act and WM-M/P	MHLG	LAs	MHLG					
(2) to modify and enact the By-Law on SWM by each local authorities based on the model By-Law	LAs	MHLG	MHLG					
A4-4: Financial Support to LAs for Formulation and Implementation of LAP-WM								
(1) to finance LAs for the formation of LAP-WM.	MHLG	EPU, MOF	---					
(2) to set the criteria for financing 3Rs programme under LAP-WM	MHLG	---	---					
(3) to finance to LAs for implementation of 3Rs programme under LAP-WM	MHLG	EPU, MOF	---					

ACTION 5: IMPROVEMENT OF INFORMATION MANAGEMENT

Objective

To establish a focal point of all information, data and knowledge on 3Rs so that it can be more useful to all the stakeholders.

Description of Activities

A5-1: Establishment of Information Management System (IMS)

An Information Management System (IMS) comprising a database of solid waste flow including recyclables should be created on a nation-wide basis. MHLG should disseminate IMS to all LAs and related stakeholders. The “Recycling Information Centre (RIC)” in MHLG shall be the focal point to manage IMS.

In addition, stakeholders’ networking database (SND) should be updated from time to time by MHLG in order to disclose current information to the public and to accelerate recycling activities by both public and private initiatives.

A5-2: Implementation and Monitoring of IMS

IMS should be implemented through the joint effort of MHLG and LAs and supported by other players such as concessionaires, NGOs/CBOs, recyclers, and end-users. LAs should collect the quantitative information and data on waste flow and fill in the forms provided by MHLG and convey to MHLG. MHLG should compile and analyse the data and prepare the database and annual report. Management and monitoring of IMS should be carried out by MHLG.

In addition, MHLG should disseminate information of 3Rs activities via website, e-mail news and media.

The Waste Minimisation Unit (explained in Action 6) in the LAs will handle information such as data collection, survey and reporting.

Outline of IMS is shown in *Article 3.2.3, Part 3, Supporting Report-1*, and details are described in *Chapter 6, Volume III Pilot Projects*. The data to be collected by IMS and their sources are shown in attached Appendix for Action 5.

Implementation steps and schedule is shown in Table 4.7.

Table 4.7 Implementation Steps and Schedule of Action-5

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule				
				2006	2007	2008	2009	2010
A5-1: Establishment of Information Management System (IMS)								
(1) to disseminate Information Management System (IMS) nation-wide	MHLG	LAs, Concessionaires	MHLG	■	○	○	○	○
(2) to conduct seminars and workshops to explain the IMS	MHLG	LAs	---	○	○	○	○	○
(3) to update stakeholders networking database at the Federal level	MHLG	LAs, Concessionaires	MHLG	■	○	○	○	○
(4) to operate Recycling Information Centre (RIC) as a focal point to manage IMS	MHLG	Private sectors	---	■	■	■	■	■
A5-2: Implementation and Monitoring of IMS								
(1) to collect and process the information of waste flow by LAs and report to MHLG	LAs	Concessionaires, Private sectors	MHLG	■	■	■	■	■
(2) to formulate database/ annual report based on the information and data submitted from LAs	MHLG	LAs, Concessionaires	---	■	■	■	■	■
(3) to compile the research and development information (R and D information)	MHLG	Universities, etc.	---	■	■	■	■	■
(4) to disseminate information of 3Rs activities via website, e-mail news and media.	MHLG	Private sectors	---	■	■	■	■	■

ACTION 6: PROVISION OF GUIDANCE TO LOCAL AUTHORITIES ON LOCAL ACTION PLAN ON WASTE MINIMISATION (LAP-WM)

Objective

To guide the Local Authorities to formulate and implement individual Action Plans for waste minimisation based on the WM-M/P with the aim of establishing an environmentally sustainable society.

Description of Activities

A6-1: Formulation of National Annual Plan for LAPs on Waste Minimisation

The National Annual Plan for formulation and implementation of LAPs-WM should be prepared by MHLG and disseminated to all States and LAs. The proposed National Annual Plan is as shown in Article A6-3. Technical and financial assistance mechanism for preparation and implementation of LAPs-WM should be formulated by MHLG.

The National Kick-off Conference on LAPs-WM should be organised inviting all LAs and States.

A6-2: Dissemination of the Guidelines for Local Action Plan on Waste Minimisation (LAP-WM)

MHLG and model LAs (MPPP, MPSJ, MDKS and MB Miri), so called “Core Team”, should disseminate experiences/ information for the preparation and implementation of LAP-WM, operation of Information Management System (IMS), source separation practices etc. Meanwhile, the trainer’s training programme for specific personnel should also be formulated and carried out by MHLG.

Guidance on how to prepare the LAP should be carried out by MHLG to all LAs through seminars and workshops by using the “Guidelines for Formulation of Local Action Plan on Waste Minimisation”. The Guideline and examples of the Local Action Plan is attached in the *Supporting Report*.

A6-3: Establishment of Waste Minimisation Unit (WMU) in the LAs

To develop the function of LAs in terms of waste minimisation practices and management of IMS, the Waste Minimisation Unit (WMU) should be established in each LA and supported by MHLG. The role of WMU will be as follows.

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

A6-4: Formulation, Implementation and Monitoring of LAP

LAPs on waste minimisation should be prepared and commence implementation by all LAs by the year 2010. As the first step, LAP formulation should be carried out in DB, MB and MP during 2006 and 2007. LAPs on the MD level should be prepared after 2008. Since the 3Rs activities in MD are affected nearby DB, MB, and MP, formulation of LAP at DB, MB, and MP levels should be started beforehand.

The monitoring of formulation and implementation of LAPs on waste minimisation should be carried out by MHLG.

Implementation steps and schedule is shown in Table 4.8.

Table 4.8 Implementation Steps and Schedule of Action-6

Activities	Implementation Bodies	Supporting Bodies	Monitoring Bodies	Schedule			
				2006	2007	2008	2009	2010
A6-1: Formulation of National Annual Plan for Local Action Plan on Waste Minimisation							
(1) to formulate National Annual Plan for LAP on waste minimisation	MHLG	LAs, Concessionaires	MHLG				
(2) to formulate technical and financial assistance mechanism for LAP	MHLG	LAs, Concessionaires	MHLG				
(3) to hold national kick-off conference on LAP inviting all States and LAs	MHLG	States, LAs	---	○			
A6-2: Dissemination of the Guidelines for LAP on Waste Minimisation							
(1) to formulate the "Core Team" and implement Trainers' Training Programme on LAP, IMS & SS	MHLG, LAs (Core Team)	States, LAs	---	○	○	○	○
(2) to implement seminars and workshops to explain the "Guidelines for LAP" to LAs	MHLG (Core Team)	States, LAs	---	○	○	○	○
A6-3: Establishment of Waste Minimisation Unit (WMU) in the LAs							
(1) to formulate regulative mechanism to establish Waste Minimisation Unit in LAs	MHLG	EPU	---				
(2) to establish WMU in each LA	LAs	MHLG, EPU	MHLG		.....	.....	.....
A6-4: Formulation, Implementation and Monitoring of LAP							
(1) to formulate Local Action Plans at DB, MB, and MP levels	LAs	MHLG, Concessionaires	MHLG				
(2) to formulate Local Action Plan at MD level	LAs	MHLG, Concessionaires	MHLG				
(3) to implement Local Action Plan	LAs	MHLG, Concessionaires	MHLG				
(4) to monitor and evaluate Local Action Plans implementations	MHLG	States, LAs	MHLG				

4.2 MODEL LOCAL AUTHORITIES ACTION PLANS

A LAP-WM is required by each LA to provide the road map for the LA to achieve waste minimisation and recycling targets that are tailored to suit its own local conditions. Along with the achievements of targets set in the LAPs-WM, ultimately the LAP-WM helps the LAs to contribute towards the national goals of realising a “*Material Cycle Society*” (vision of the WM-M/P) and achieving the national recycling target of 22% in the year 2020 set by the *National Strategic Plan for Solid Waste Management*.

In order to determine the optimum contents for inclusion in the LAP-WM and the process of preparation, during this Study LAPs-WM were formulated at 4 model LAs, namely Majlis Daerah Kinta Selatan (MDKS), Majlis Perbandaran Subang Jaya (MPSJ), Majlis Bandaraya Miri (MBM) and Majlis Perbandaran Pulau Pinang (MPPP). These LAPs-WM were formulated under the joint planning works between the local taskforce, which was organised by the LAs, and JICA Study Team as shown in Figure 4.1.

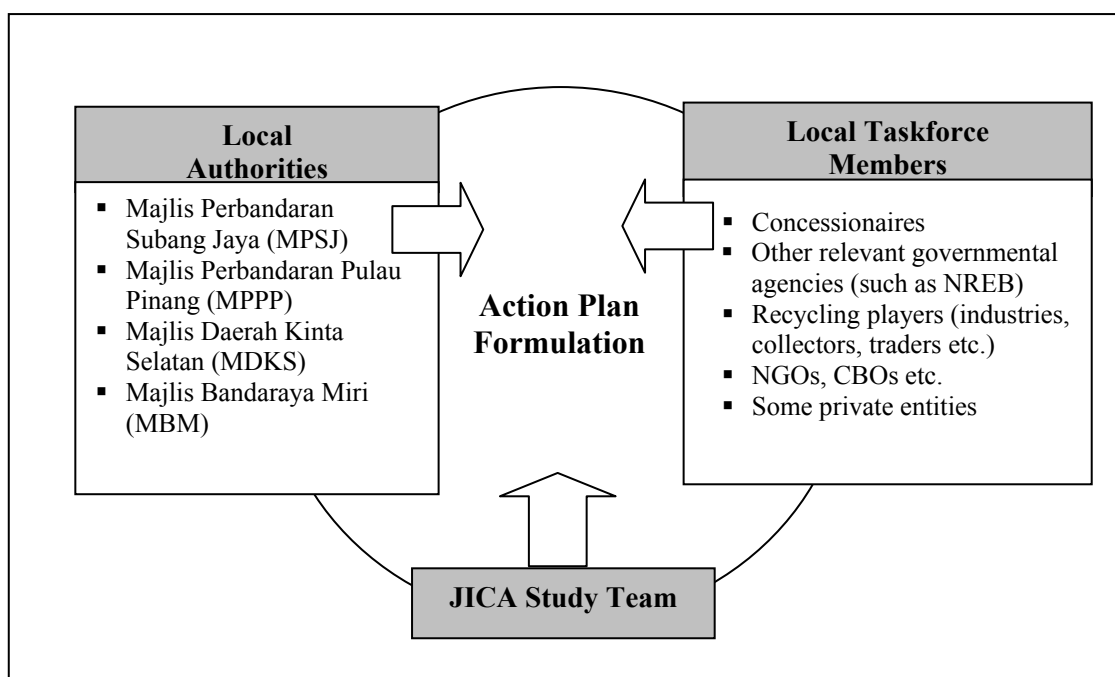


Figure 4.1 Organisation Framework for the A/P Formulations

The contents of the formulated LAPs-WM were based on the following outline:

Chapter 1 (Introduction)

This chapter describes the background, objectives and scope of the A/Ps, including the organisation framework for the A/P formulation, as well as the role of all relevant stakeholders in the LA.

Chapter 2 (State of Waste Management and Recycling in the LAs)

This chapter describes the background information and available data on existing solid waste management and recycling system in the LA. The information on SMW includes the institutional frameworks, service areas, waste generation rate and compositions, waste storage, collection, treatment and disposal systems etc. On the other hand, information on recycling includes some history and background of recycling practices in the LA, types of recycling players involved, types and amount of recyclable materials collected, performance of recycling in the LA, issues and problems faced with some proposed countermeasures etc.

Chapter 3 (Targets of Waste Minimisation and Recycling)

This chapter describes the potential and targets of waste minimisation and recycling in the LA, including some projections of future waste generation, composition and recyclable materials production within the LA areas in the coming five (5) years. This chapter also proposes the target recycling rates to be achieved by the LAs based on the recycling potential and local conditions.

Chapter 4 (Actions to Achieve the Targets)

This chapter describes some proposed key actions to be carried out by the LA in order to achieve the recycling targets. This includes some legislative instruments, economic instruments, information and awareness campaigns, strengthening of recycling players etc. It also summarises some proposed actions to be taken by specific generation sources such as households, commercial entities, restaurants, hotels, offices and manufacturers. In addition, cost implications of implementing the key actions are also presented.

Chapter 5 (Monitoring and Implementation Schedule for the A/Ps)

This chapter describes some proposed monitoring and evaluation measures for the performance of the A/P implementation. Some performance indicators are recommended and periodical reporting systems are introduced. On the other hand, an implementation schedule for the entire proposed A/P is presented in this chapter for the LA.

Based on the experiences gained from preparing the LAPs-WM, a “*Guideline for Preparation of Local Action Plan on Waste Minimisation*” was prepared.

The steps involved in formulation of LAPs-WM are explained in the guidelines. In general, there are seven steps for the formulation of LAP-WM as shown in Figure 4.2:

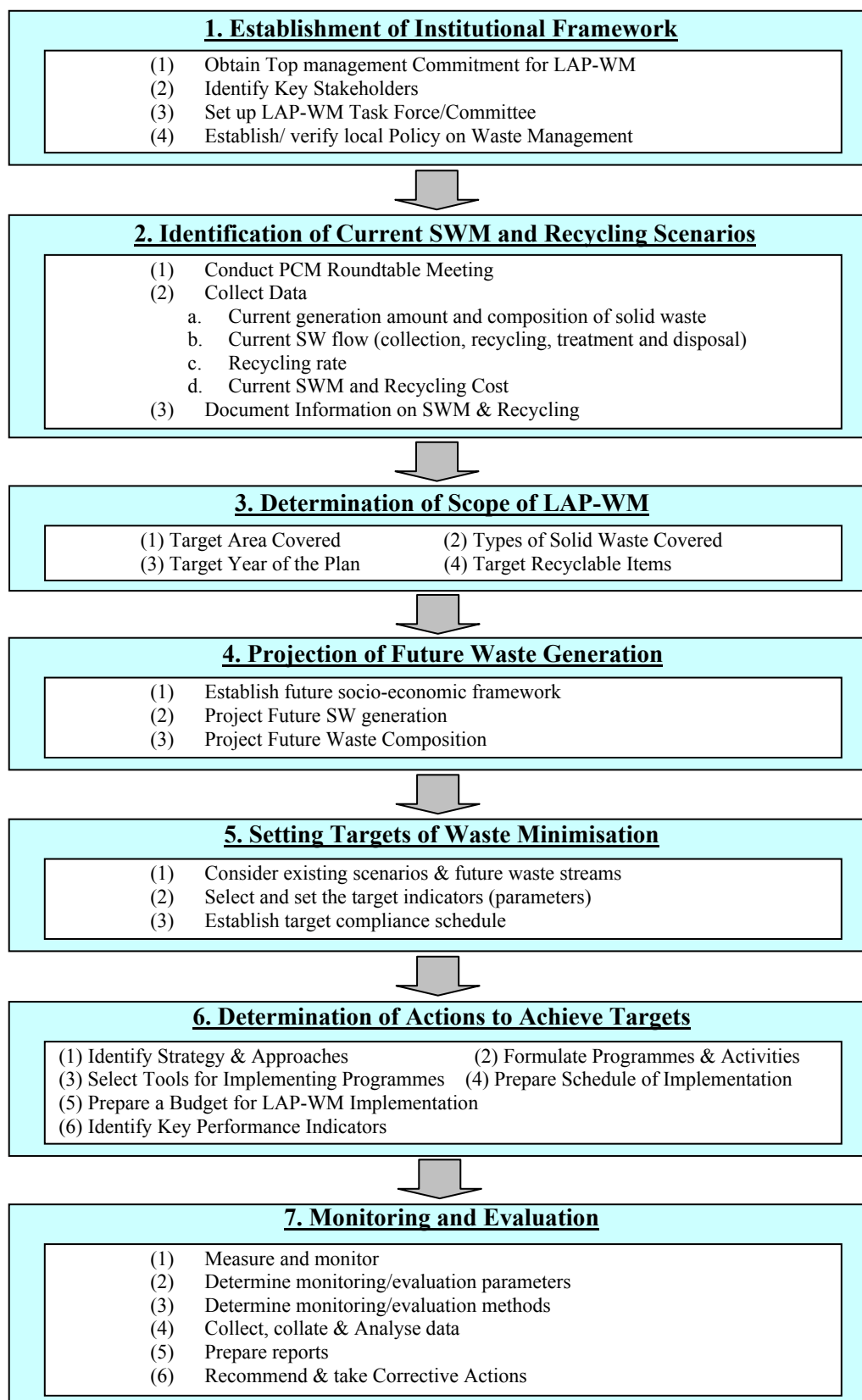


Figure 4.2 Basic Procedure for Formulation of LAP-WM

Based on the experiences of formulating the LAPs-WM in the Model LAs, some issues faced throughout the process of formulating the LAPs-WM are summarised in Table 4.9 including some counter-measures taken to overcome those issues:

Table 4.9 Issues Faced and Countermeasures Taken for the Formulation of LAPs

No	Issues / Problems	Countermeasures
1	Consent from the top management	<ul style="list-style-type: none"> • Comprehensive proposal • Commitments from dedicated officers • Conveyance of information from the Model LAs (Creation of “peer pressure”)
2	Lack of manpower	<ul style="list-style-type: none"> • Effective involvement of the limited human resources • Involvement of many departments through inter-departmental committees • Involvement of other stakeholders
3	Lack of commitments	<ul style="list-style-type: none"> • Attract the interest of the officers by creating more attractive activities • Firm commitment and leadership of the “chief officer”
4	Lack of Expertise	<ul style="list-style-type: none"> • The “<i>Guideline for Formulation of Local Action Plan on Waste Minimisation</i>” should be referred to so that the officers are guided towards formulation of LAP-WM • Carry out more training and capacity building programs for the officers by MHLG
5	Lack of budget	<ul style="list-style-type: none"> • Make use of whatever available data as well as some “default” data from other sources • Create affordable and not burdensome LAP-WM for the LAs • Budget allocation from Federal government to LAs
6	Lack of cooperation from the stakeholders	<ul style="list-style-type: none"> • Explain clearly to the stakeholders about the benefits and purpose of LAP-WM • Appreciate and recognise the roles of the stakeholders by the LA
7	Reluctance to accept changes	<ul style="list-style-type: none"> • Modify ideas to reduce the red-tapes etc, so that they are acceptable and more easily to be adopted
8	Lack of confidence in implementing the LAP-WM	<ul style="list-style-type: none"> • Ensure that the entire LAP-WM is prepared based on the LA’s own needs and requirements • Ensure that the “Actions to be taken” are clearly understood and decided by the LA based on their own capability and local conditions

In conclusion, it is recognised that many of the LAs face problems of lack of manpower, budget and expertise as well as low levels of cooperation from relevant stakeholders; conditions which would discourage them to formulate and implement LAPs-WM. The “*Guideline for Formulation of Local Action Plan on Waste Minimisation*” understands these issues and has been designed to permit the LAs to take the first steps in preparing their LAPs-WM based on their individual conditions and within their particular limitations in spite of the problems they are facing.

4.3 GUIDELINES

Based on the experience and output of the Study on National Waste Minimisation in Malaysia, including pilot projects activities, four (4) Guidelines have been prepared to assist target stakeholders to initiate waste minimisation activities. The Guidelines formulated are:

1. Guidelines for Enhancement of 3Rs Activities in Schools
2. Guidelines for Formulation of LAP-WM
3. Guidelines for Source Separation of Municipal Solid Waste (MSW)
4. 3Rs Action Guide (3RAG)

Outlines of the guidelines are shown in the Table 4.10 below. The Guidelines are detailed in Supporting Report II.

Table 4.10 Outline of Guidelines Prepared by the Study

Item	Guidelines for Enhancement of 3Rs Activities in Schools	Guidelines for Formulation of LAP-WM	Guidelines for Source Separation of MSW	3Rs Action Guide (3RAG)
Objectives	To assist schools to initiate, improve and sustain a waste minimisation programme.	To guide LAs in formulating and implementing the LAP-WM on their own initiatives and contribute to the waste reduction.	To guide LAs and their 3Rs partners on planning, implementing and improving source separation activities in partnership among the various stakeholders.	To guide the key waste generators on how to practise 3Rs activities in their daily lives.
Target group	Teachers in primary and secondary schools	LAs	LAs (Concessionaires)	Various stakeholders
Players	Students, teachers, clubs, school principals, PTAs, communities, NGOs, concessionaires, recyclers, District education officer, LAs, MOE, MHLG	LAs, concessionaires, recyclers, NGOs/CBOs, business entities/institutions, general public	LAs, concessionaires, waste generators (Households, business entities, governmental offices), recycling players (Collectors, recycling centres, NGOs/CBOs)	Waste generators; (Households, offices, schools, restaurants, hotels, shopping malls etc.)
Contents	<ol style="list-style-type: none"> 1. What are the 3Rs? 2. Why have a 3Rs Programme 3. Plan-Do-Check-Act Cycle Approach 4. Where do I start? 5. STEP 1: Planning (PLAN) 6. STEP 2: Implementation (DO) 7. STEP 3: Monitoring & Measurement (CHECK) 8. STEP 4: Review & Improvement (ACT) 9. 3Rs PDCA for beginners (LEVEL1) 	<ol style="list-style-type: none"> 1. Introduction 2. Establishment of Institutional Framework 3. Identification of Current SWM and Recycling Scenarios 1. Determination of Scope of LAP-WM 2. Projection of Future Waste Stream 3. Setting the Targets of Waste Minimisation 4. Determination of Actions to Achieve the Targets 5. Monitoring and Evaluation 	<p>Following steps are provided;</p> <p>STEP 1: Formulating a Source Separation Plan for LAs</p> <p>STEP 2: Planning Source Separation Programme in Target Area</p> <p>STEP 3: Awareness and Communication</p> <p>STEP 4: Implementation & Monitoring</p> <p>STEP 5: Review & Improvement</p>	<p>Following tips of 3Rs activities are provided;</p> <ol style="list-style-type: none"> 1. General tips 2. Tips for households 3. Tips for offices 4. Tips for schools 5. Tips for restaurants, cafeterias & lunch rooms 6. Tips for hotels 7. Tips for supermarket 8. Tips for malls 9. Composting tips

5. PILOT PROJECTS

5.1 OBJECTIVES OF THE PILOT PROJECTS

In conjunction with the WM-M/P and A/P, three pilot projects were conducted over a 6-month period in the second half of 2005 to demonstrate and test key recommendations of the plans; and inversely, to receive feedback on the applicability and appropriateness of these recommendations.

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

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

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

The pilot projects, their objectives and target groups are summarised in Table 5.1.

Table 5.1 Pilot Projects and Target Groups

PP	Project Objective	Target Groups
PP-I	National Recycling Information System	MHLG, LAs
PP-II	Local Waste Minimisation Unit and Source Separation of MSW	LA, NGOs, CBOs, RAs, Institutions, Religious Organisations, Schools, etc.
PP-III	Waste Minimisation Awareness and 3Rs Programme and Activities in Schools	Primary and Secondary School Students and Teachers, Parents, PTAs,

5.2 IMPLEMENTATION FRAMEWORK OF PILOT PROJECTS

The Pilot Projects had been carried out in collaboration amongst the taskforces and counterparts of MHLG and/or model LAs, local consultants, JICA study team and target groups including residents, NGOs/ CBOs, schools, concessionaires, recyclers etc. In all the pilot projects, the taskforces and counterparts from the Malaysian side were requested to take the lead, whilst local consultants and the JICA study team provided support. The know-how and technologies were transferred to the counterparts via the local consultants through the planning and implementation process for each pilot project. The conceptual diagram of the implementation framework of the pilot projects is shown in Figure 5.1.

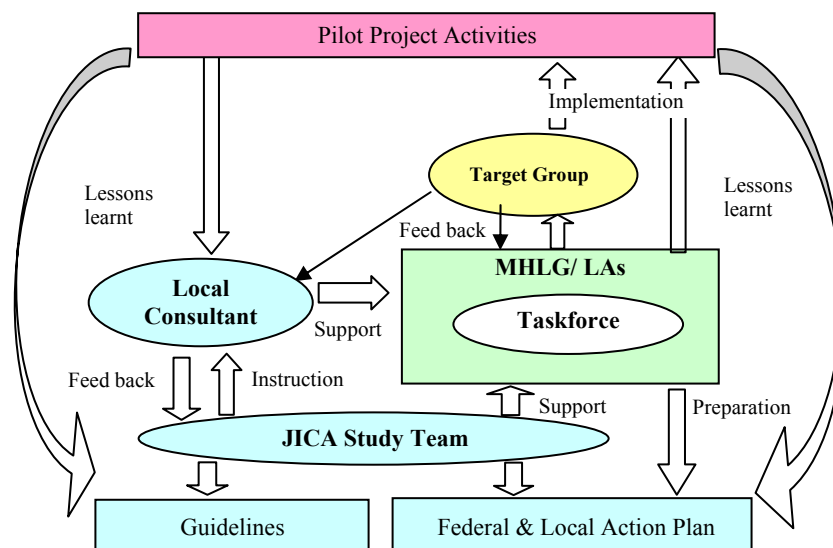


Figure 5.1 Implementation Framework of Pilot Projects I, II, III

5.3 PP-I: ESTABLISHMENT OF NATIONAL RECYCLING INFORMATION SYSTEM

(1) Outline of PP-I

Project components and implementation schedule of PP-I is shown in Table 5.2.

Table 5.2 Implementation Schedule of PP-I

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

PP-I was carried out targeting MHLG and with the participation of the ten (10) LAs shown in Table 5.3.

Table 5.3 List of PP-I Participating LAs

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

(2) Establishment of Recycling Networking Unit (RNU)

The Recycling Networking Unit (RNU) was established under the Health and Environment Engineering Division, MHLG, and two officials were appointed as taskforce members of this RNU. The workstation was set up in the Bilik Kitar Semula at MHLG, comprising of a desktop computer together with the necessary peripherals and supporting software. Major tasks of RNU were as follows;

- Collection and management of data/information on SWM from LAs
- Preparation/ maintenance of Stakeholders Directory
- Liaison with stakeholders
- Public Relations on 3Rs

(3) Establishment of Data & Information Management System (IMS)

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

Under the National Recycling Programme (NRP), all participating LAs (LAs) are supposed to prepare and submit regular monthly reports on their recycling activities to MHLG. The report is to be divided into 2 main sections; the “Report on Recycling Programme” and the “Recyclables Collection Data”.

At present, a total of 103 LAs have registered their interest in participating in the NRP. However, a preliminary review of the reports submitted to MHLG indicate that only 38 LAs have submitted at least one report in the past 2 years, and this accounts for only 37% of all the participating LAs.

Several issues identified from the review of reports collected as follows;

- There were no information and data kept on the LAs recycling related organisational structure and functions, i.e. names and contact details of personnel involved in recycling, number and location of collection centres/ bins, the networking and existing infrastructure, etc.
- The few available Recycling Programme Reports were mostly submitted in 2003 and thus the information and data provided were outdated.

- Majority of the recyclables collection data reports only indicated activities and collection data that were carried out by the LAs or by their contractors / SWM concessionaire companies. There was very little information on the activities of private recyclers etc.
- Reports although generated in digital format (spreadsheets) by the LAs, were transmitted to MHLG via fax / surface mail (hardcopy format). This requires MHLG to repeat the time-consuming manual data entry.

2) Development of New Reporting Forms

Based on the issues identified, a new recyclables collection data reporting method and format were formulated to collate data that can be used to determine status of the LA's recycling collection activities and also to estimate the recyclables recovery rate. This format, shown in Table 5.4, was prepared taking into consideration the waste flow, the players involved, and also the logistics and means of collecting the information from the various sources.

Table 5.4 New Recyclables Collection Data Form

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

3) Information Management System (IMS)

The main purpose of the Information Management System (IMS) is to create a database of the recyclables collection data and key information that have been submitted by the LAs, in electronic format. With the system, key data can easily be accessed, searched, tabulated and presented in charts form for easier review, analysis and presentation. Figure 5.2 shows the basic structure of the IMS.

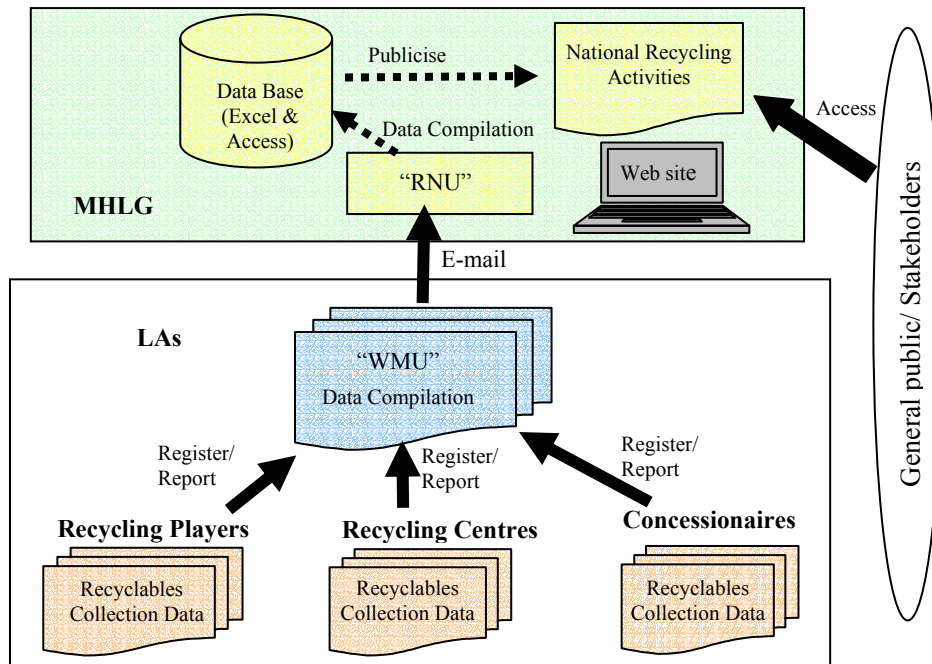


Figure 5.2 Basic Structure of the IMS

4) Development of Local Authority Information Database

To obtain as much information as possible on the LA recycling activities for the database, a postal questionnaire survey exercise was conducted in cooperation with MHLG whereby questionnaire forms were sent to all the 104 LAs. Fifty-nine (59) of the 104 LAs submitted replies. The data and information was compiled into an Excel database, and further converted to the Microsoft Access Database. The database comprises the following information:

- General information about the LAs, including the council address, email and website address, the key personnel and their contacts details, etc.
- Location of the LA's collection centres, collection bins and the operators, i.e. either by LAs or by LAs appointed contractors.
- Type of recyclables the LAs or collectors will collect.
- Stakeholders' directory as submitted by the LAs. Those marked "TIADA" indicate that the LAs did not keep any of their own stakeholders' list or directory.

Activities		Jun	Jul	Aug	Sep	Oct	Nov
PP-II-2: Source separation of MSW							
1	Est. of Source Separation System						
1.1	Selection of target area	■					
1.2	Stakeholders workshop			○			
1.3	Planning of source separation	■	■				
1.4	Explanatory meeting		○				
1.5	Implementation of source separation			■	■	■	■
2	Implementation of Campaign for 3Rs				■		
3	Implementation of questionnaire survey		■		■		■
4	On-the-Job Training	←	-----	-----	-----	-----	→

PP-II was implemented based on the following organisation framework formulated by the Study. The role of the Waste Minimisation Unit (WMU), which was provisionally established in each model LAs, and partnership structure with the other players in the implementation of PP-II are shown in Figure 5.3.

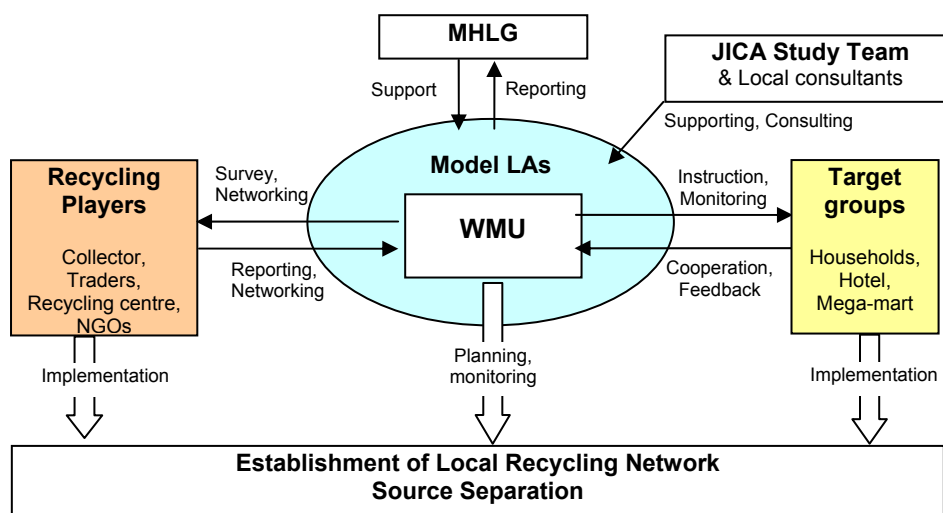


Figure 5.3 Organisation Framework for the Implementation of PP-II

Photographs of PP-II activities in each MPPP, MPSJ and MBM are shown in Plate 5.1, 5.2 and 5.3, respectively.

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

Activities and results of PP-II-1 in each MPPP, MPSJ and MBM are summarised as shown in Table 5.6. In all three (3) LAs, through the pilot project activities, the following two key points were identified.

- Necessity of formulation of recycling network at the local level in order to promote and expand recycling activities
- Necessity of establishment of WMU in LA as a focal point and/or coordination body of 3Rs at the local level

Table 5.6 Activities and Results of PP-II-1

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

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

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

1) Component of PP-II-2

In order to cover different cases for source separation, several different target groups, i.e. terrace houses and apartment for households, office complex, mega-mart and hotel were selected for PP-II-2.

Table 5.7 shows the outline of source separation system formulated and implemented in each target group. Three kinds of source separation methods were introduced at the waste generation points, i.e. 2, 3 and/or 4 separation items and different collection systems: door to door collection and station collection, and different collectors, i.e. recyclers, concessionaires, contract-out collection companies, NGOs, etc. Equipment to be adopted for each target group was also different.

Table 5.7 Outline of Source Separation Systems Formulated by PP-II-2

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

Flow diagram of PP-II-2 is shown in Figure 5.4. In order to clarify the change of awareness levels of target groups through the pilot activities such as campaign, explanatory meetings, source separation practices, questionnaire surveys were carried out for three (3) times; i.e. before, during and after the source separation activities.

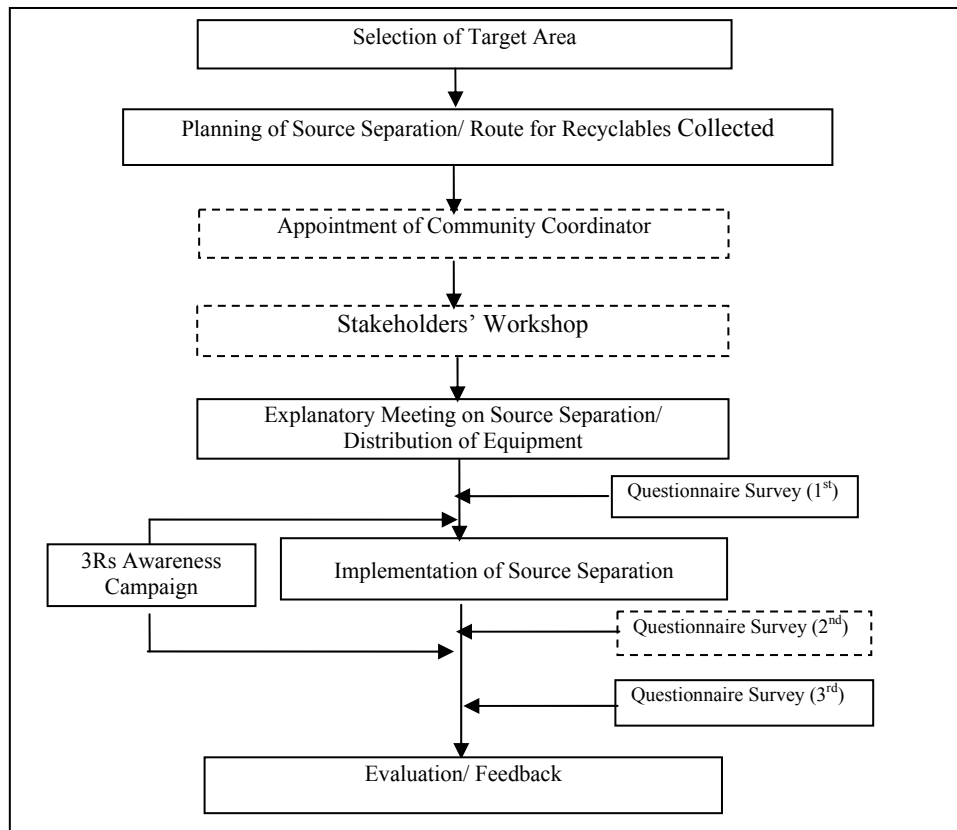


Figure 5.4 Flow Chart for Implementation of PP-II-2 Source Separation

2) Results of PP-II-2

(a) Participation Ratio and Recyclables Collected

Table 5.8 shows the participation ratio of source separation activities in each target group, composition of recyclables collected and average amount of recyclables collected. Participation ratios in average are rather high (24% in MPPP, 60% in Krokop 10 in MBM, 28% in MPSJ) except Krokop 6 in MBM (5%), and more than 75% of recyclables were paper wastes (98% in Krokop 10 in MBM, 86% in Krokop 6 in MBM, 76% in MPSJ) except in MPPP (44%).

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

(b) Change of Awareness Level on 3Rs

Figure 5.5 shows the change in knowledge on 3Rs, including awareness about recycling amongst the target groups within each MPPP, MPSJ and MBM. It was noticed that awareness on every questionnaire items increased through PP-I activities and, among the three LAs, the target group in MPPP had comparatively high awareness level on 3Rs. Meanwhile, it was noted that there were still some people who were “not sure” about ideas for reduce, reuse and recycle of wastes. Therefore, it is recommended the awareness-enhancing programme be continued.

Table 5.8 Summary of Results of Source Separation for Households

	MPPP	MBM	MPSJ
Type of house	Terrace house	Terrace house	Apartment
No. of HHs.	409 HHs incl. 12 shop houses	184 HHs (Krokokop 10)	288 units
Collection methods	Door-to-door	Door to door & Station collection	Station collection
Equipments	1 HDPE bin	1 plastic bag & box for papers	3 plastic bags & containers
Separation method	*2 separation	*3 separation	*4 separation
Collector	Private recycler	NGO	Private recycler
Frequency	once/ week (Sunday)	once/ 2 weeks (Sunday)	once/ week (Sunday)
Incentive	None	Donation (Directly)	Proceeds were returned to committee
Participation Ratio	24 % (average)	60 % (average)	28 % (average)
Composition of recyclables collected			
Amount of Recyclables Collected	Average 487 kg/time	Average 1,355kg/time	Average 456 kg/time

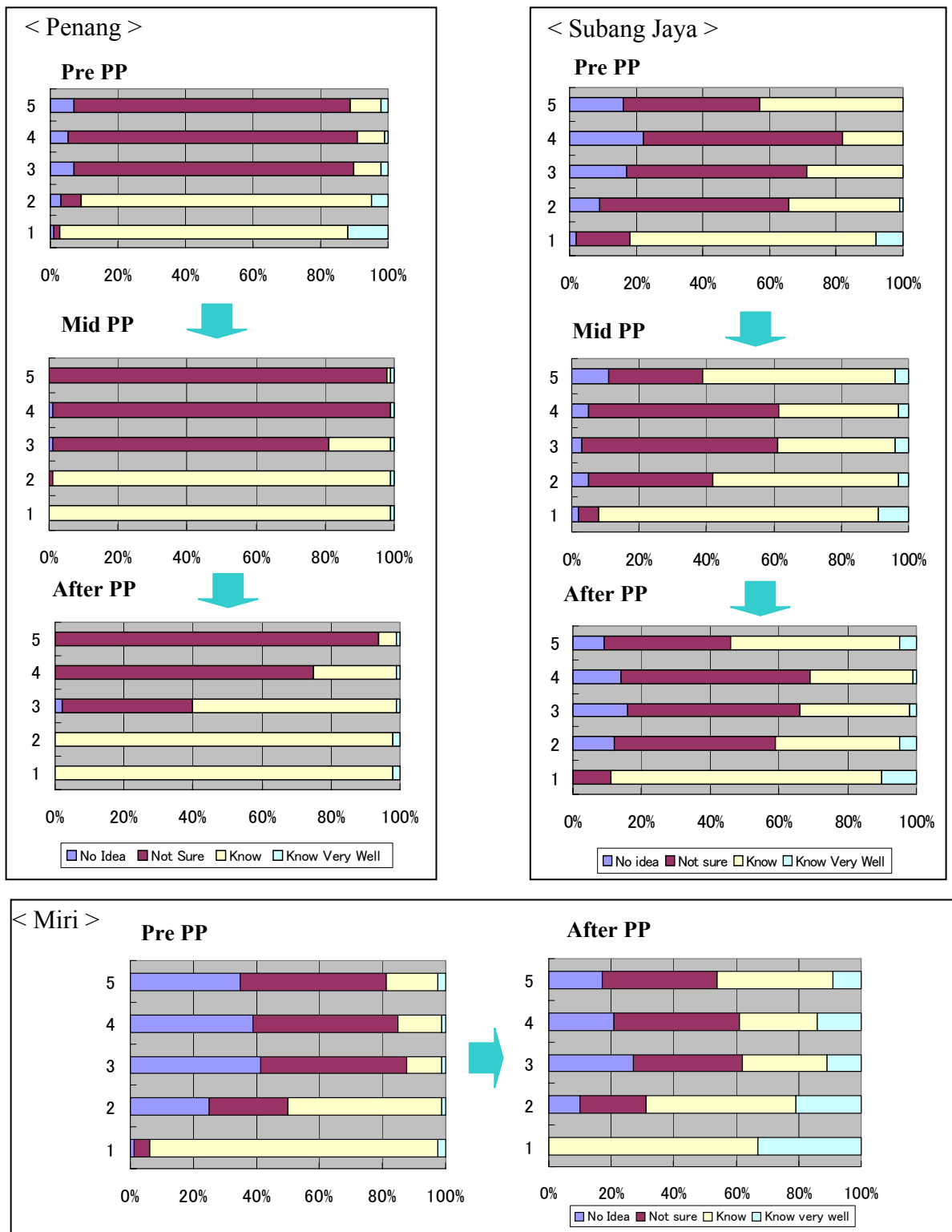


Figure 5.5 Result of Awareness Survey (pre, mid and post PP)

(c) Preparation of Guidelines for Source Separation

Based on the experience of PP-II-2, “Guidelines for Source Separation of MSW” were formulated. Flow chart introduced in the Guidelines is as shown in Figure 5.6.

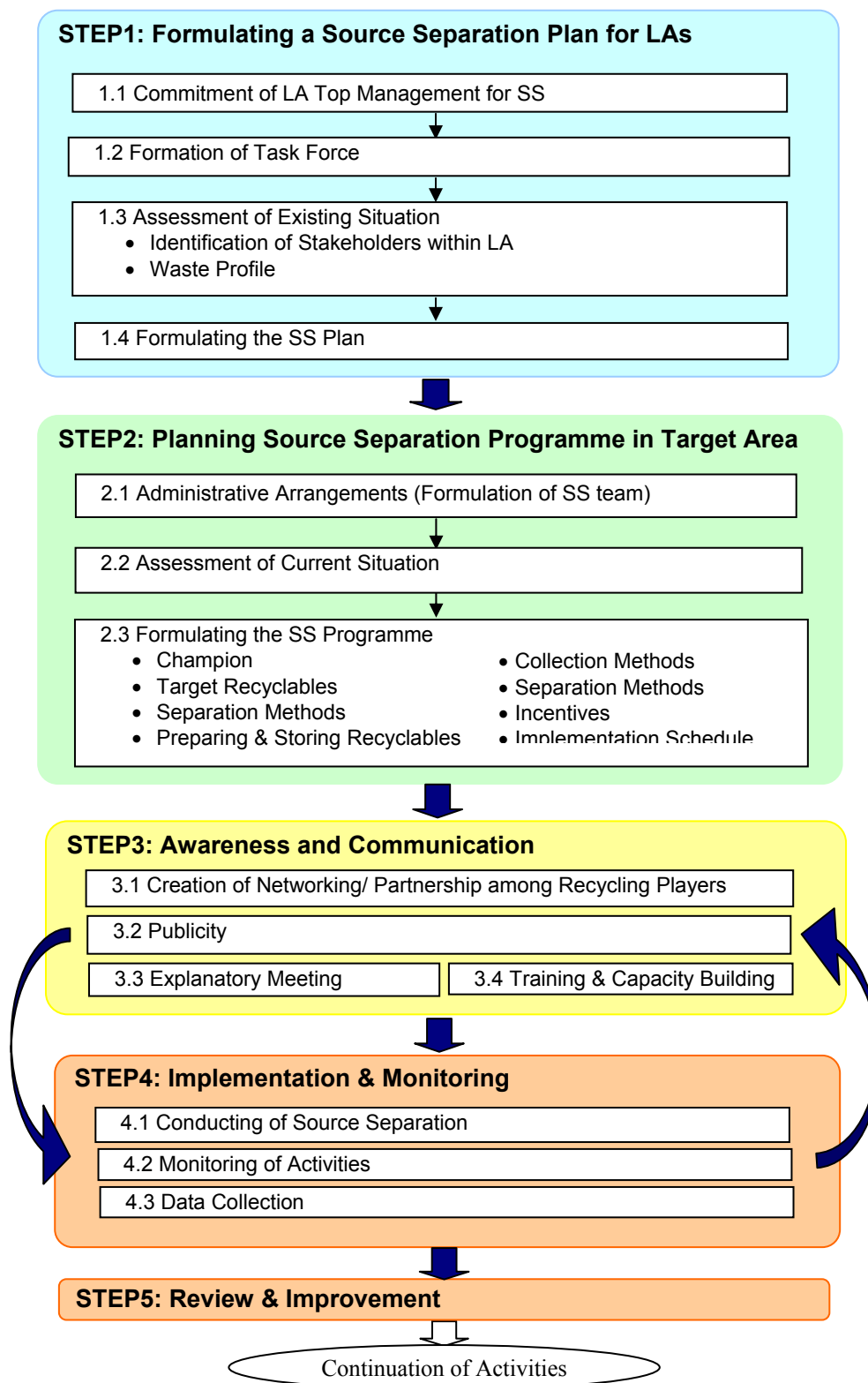


Figure 5.6 Flow Chart for the “Guidelines for Source Separation”



PCM Roundtable



OJT for MPPP Officers



Briefing on Source Separation for Residents



Launching Ceremony



3Rs Workshop (03 September 2005)



Distribution of Bins



3Rs Campaign (3Rs Camp for Students)

Plate 5.1 PP-II Activities in MPPP



PCM Roundtable



Stakeholders' Workshop



Explanatory Meeting on Source Separation
At De Palma Condominium



Registration to the Project



Explanatory Meeting at MPSJ Complex



Launching Ceremony at South City Plaza



3Rs Campaign at South City Plaza



Plate 5.2 PP-II Activities in MPSJ



PCM Roundtable



OJT for Officers in MBM



Questionnaire Survey



Launching Ceremony



Explanation Meeting at Dynasty Hotel



Source Sorting Activities at Krokop



3Rs Campaign with Incentives



Plate 5.3 PP-II Activities in MBM

5.5 PP-III: 3RS ACTIVITIES IN PRIMARY & SECONDARY SCHOOLS

(1) Outline of PP-III

Project components and implementation schedule of PP-III are shown in Table 5.9.

Table 5.9 Implementation Schedule of PP-III

	Activities	Jun	Jul	Aug	Sep	Oct	Nov
1	Prep. of Guidelines on Enhancement of 3Rs Activities in Schools						
1.1	Drafting of guidelines	■					
1.2	Workshop on guidelines with teachers			○			
2	Implementation of 3Rs Activity Programme in Schools in Johor						
2.1	Development of trial programmes for schools			■			
2.2	Explanatory meeting				○		
2.3	Implementation of 3Rs activities				■		
3	Implementation of 3Rs Award Programme for Schools in Miri						
3.1	Development of 3Rs award programme	■					
3.2	Identification and selection of schools		■				
3.3	Explanatory meeting for schools			○			
3.4	Implementation of 3Rs activities			■			
3.5	Monitoring and evaluation of schools - Monitoring - Evaluation (Achievement report) - Evaluation (Site inspection)			■		■ ■	
3.6	3Rs award ceremony					○	
3.7	Capacity development of school teachers - Preparation of education material - Workshop with teachers		■			○	

Photos of PP-III activities in each of Johor State and MBM are shown in Plate 5.4 and 5.5, respectively.

(2) Preparation of Guidelines on Enhancement of 3Rs Activities in Schools

The Guidelines were prepared with the partnership work amongst MHLG, LAs, MOE, school teachers and JST, and with the ultimate aim of minimising waste generation and disposal, and thereby reducing impacts on the environment. At the school and community levels, the guidelines aimed at:

- Streamlining 3Rs Activities in Schools
- Encouraging Participatory Approach
- Recognising Efforts in the 3Rs
- Ensuring Sustainability of 3Rs Programmes in Schools

The target group or primary end-users are teachers in primary and secondary schools throughout the country who are interested in initiating, improving and sustaining a waste minimisation programme.

The guidelines introduce the concept of categorising schools into 3 groups according to their prevailing level of awareness and participation in 3Rs activities, and provide step-by-step instructions to assist schools engaged in each level of 3Rs-related activities:

Level 1: Without a Waste Minimisation Programme

Level 2: With a Basic Waste Minimisation Programme

Level 3: With an Active Waste Minimisation Programme

The process for planning and implementing a school's 3Rs programme is based on the PDCA (Plan-Do-Check-Act) concept. Contents of the Guidelines are as shown below.

Guidelines on Enhancement of 3Rs Activities in Schools	
CHAPTER 1	WHAT ARE THE 3Rs (reduce, reuse & recycle)?
CHAPTER 2	WHY HAVE A 3Rs PROGRAMME
CHAPTER 3	PLAN-DO-CHECK-ACT CYCLE APPROACH
CHAPTER 4	WHERE DO I START?
CHAPTER 5	STEP 1: PLANNING (PLAN)
CHAPTER 6	STEP 2: IMPLEMENTATION (DO)
CHAPTER 7	STEP 3: MONITORING & MEASUREMENT (CHECK)
CHAPTER 8	STEP 4: REVIEW & IMPROVEMENT (ACT)
CHAPTER 9	3Rs PDCA FOR BEGINNERS (LEVEL1)
ATTACHMENTS & APPENDICES	

(3) Implementation of 3Rs Activities Programme for Schools in Johor

3Rs programmes were conducted in 6 schools in Johor State to test the Guidelines on a pilot scale.

1) Development of Programmes

3Rs programme and activities for this pilot project were designed specifically to assist the schools to implement the programme and activities during the 5-week pilot project from September to October 2005.

Three levels of 3Rs programmes and activities were prepared for the pilot project, essentially in recognition of the different levels of awareness to waste minimisation in schools. Outline of the programme designed for pilot project is as shown in Table 5.10.

Table 5.10 Outline of the Programmes for Schools in Johor

	Level 1	Level 2	Level 3
Objective	<ul style="list-style-type: none"> To enhance students' and staffs' awareness on 3Rs To minimise waste generated from school 		
	<ul style="list-style-type: none"> To introduce the concept of source separation at source 	<ul style="list-style-type: none"> To reduce use of plastic bags in canteen 	<ul style="list-style-type: none"> To convey the message to their family members
Target area	Classroom, Staff room, School office	Canteen	Students' home
Activities	<ul style="list-style-type: none"> Set up the 3Rs Team Conduct waste survey in class room Set up a recyclables collection point in each classroom 	<ul style="list-style-type: none"> (Set up the 3Rs Team) Conduct waste survey at canteen Replace plastic bags for drinks into reusable cups Encourage teachers/students to bring own mug. 	<ul style="list-style-type: none"> (Set up the 3Rs Team) Conduct waste survey at home

2) Selection of Schools

Under instructions from MOE, the Johor State Education Department selected 3 primary and 3 secondary schools with varying levels of 3Rs awareness.

3) Implementation of 3Rs Activities

The 6 schools embarked on the pilot project on 12th September 2005. The 3Rs programmes were implemented in an organised and systematic way that reflected the use of the "Plan-Do-Check-Act (PDCA)" method advocated in the Guidelines.

Although awareness and practice of waste minimisation in the 6 schools vary considerably, the pilot project succeeded in achieving the following results:

- Reinforce awareness amongst staff and students on the need to adopt a 3Rs lifestyle in school as well as at home.
- Recognise that the school principal must be a 3Rs leader if the 3Rs programme in school is to succeed and be sustained.
- Recognise that waste minimisation is a team effort and that the 3Rs Team must be supported by sub-committees comprising of fellow teachers and senior students.
- Involve parents and the community in the school's 3Rs programme so that the 3Rs lifestyle is adopted both in school as well as in the home.

Establish partnerships and networking with the LA and local waste collector/recycler and to tap these organisations for assistance, support, etc.

(4) Implementation of 3Rs Award Programme for Schools in Miri

1) Development of 3Rs Award Programme

3Rs award programme for schools was prepared and implemented by the Organisation Committee lead by the Miri LA21 Solid Waste Reduction Group. Members of the committee were MCC, NREB, DOE and NGOs.

The programme was implemented in accordance with the procedures shown in Figure 5.7.

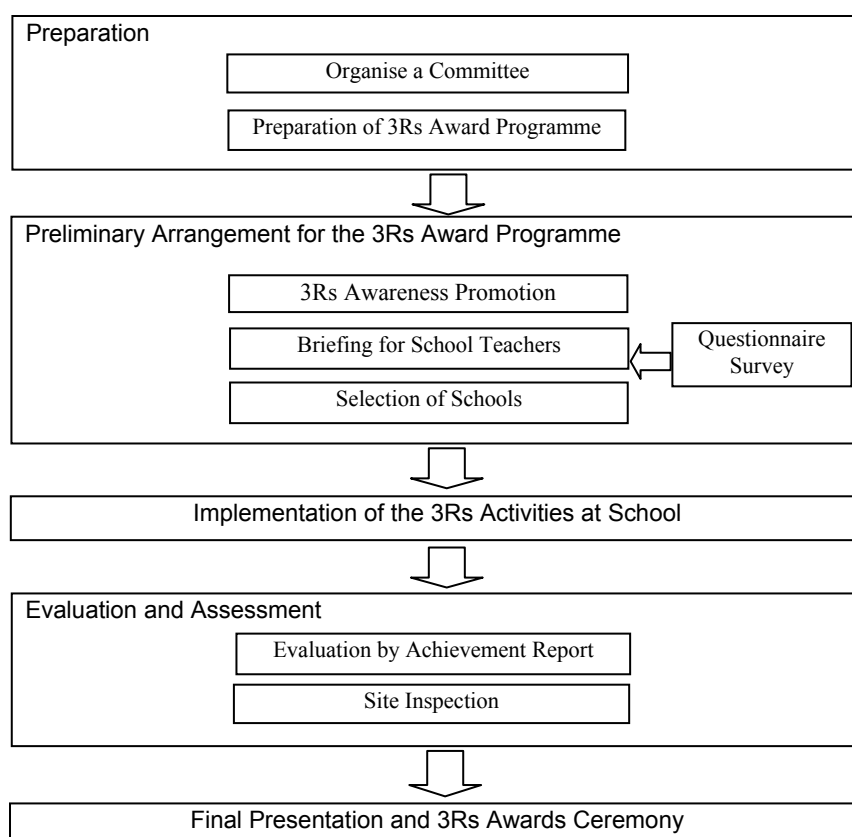


Figure 5.7 Flow Chart of 3Rs Award Programme

All the forty (40) schools in Miri were invited to participate in the 3Rs award programme. Through the questionnaire survey asking on willingness to participate and explanatory meeting for school teachers; nine (9) schools out of 40 decided to participate in the programme.

2) Implementation of the Programme

During the three month period, from August to October 2005, each of the 9 schools prepared and implemented their respective programme on 3Rs. Some examples of the activities carried out by primary and secondary schools are listed in Table 5.11.

Table 5.11 Examples of 3Rs Activities in Primary and Secondary Schools

School	3Rs Activities
Primary Schools	<ul style="list-style-type: none"> • 3Rs awareness campaign (Morning announcements and staff meeting) • Creative handicrafts during art lessons • Setting up of 3Rs and recycling corner in classroom • Study tour to recycling centres, public library, other schools, etc. • Reduce programme (Bring own food containers to the canteen to reduce polystyrene packs) • Collection of recyclables (newspapers, plastic bottles and clothing) • Composting • Drawing competition (comic and poster)

Secondary Schools	<ul style="list-style-type: none">• Handicraft using used materials (replica of symbols representing Sarawak)• Repairing of broken tables and chairs• Collection of recyclables with PTA, neighbouring residents, and recycling agents.• Setting up of recycling corners in every class• Reusing of the single-sided paper• Reusing of plastic containers to make a model in the biology class• Landscaping (build a replica of the Petronas Twin Towers from 4220 discarded aluminum cans.)• Classroom teaching (Conduct mini project on 3Rs during lessons)
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3) Evaluation and Assessment of the Programme

3Rs activities in each school were monitored by the organising committee and evaluated based on the following evaluation criteria.

- Contents of 3Rs planning & physical work
- Initiatives in waste reduction & reuse
- Contents of 3Rs awareness programme
- Amount of recyclable items collected
- 3Rs organisation set up
- Creativity of the 3Rs programme & activities

The judging system was done in three (3) steps, i.e., 1st evaluation of achievement report submitted by each school, 2nd site inspection and assessment of achievement, and 3rd the final presentation at the 3Rs Award Ceremony.

3Rs Award Ceremony, chaired by the Mayor of Miri City, was held on 28th October 2005 in Miri. In the ceremony, the 5 school finalists carried out presentation on their activities; including, school background, their objectives and goals of 3Rs programmes, 3Rs plans, organisation chart of 3Rs team and actual 3Rs activities. The school finalists also exhibited their creative products, colourful posters and other attractive ideas on 3Rs.

After presentation, the committee and guests did final judging, and winners for the 3Rs Award Programme in 2005 were decided. All 9 participating schools received a certificate of appreciation.

Meanwhile, in order to share the experience on school 3Rs activities, six (6) schools that participated in PP-III from Johor State were also invited to the award ceremony in Miri. These schools also participated in the exhibition held in conjunction with the award ceremony.



Workshop on Guidelines for School 3Rs(KL)



Briefing for 3Rs Programme in Johor



Reuse Activities in Classroom (SK Pasir Gudang)



3Rs Information Corner in Classrooms



Waste Separation in Classrooms
(SK Pasir Putih)



3Rs Briefing to students
(SK Pasir Putih, Pasir Gudang)



Sculptures from Aluminum Cans
(SMK Sultan Mahmood Iskandar, Muar)



Making handicraft from recyclables
(SK Sultan Abu Bakar, Muar)

Plate 5.4 PP-III Activities in Johor State



Briefing to Teachers



Banner for 3Rs Award at the school entrance



Construction of Replica of Twin Tower from Aluminium Can



Presentation at Award Ceremony



Award for Champion



Exhibition at Award Ceremony



Hands-on Activities (Source Sorting Demonstration)
at Workshop for Teachers

Plate 5.5 PP-III Activities in MBM

5.6 EVALUATION OF PILOT PROJECTS

Generally, successful waste minimisation plans are those where the plan objectives correspond to the priorities of institutional players and service users, and where the LAs and service users are regularly involved in decision-making at all stages of the waste minimisation planning cycle. Participation helps to reduce the risk of plan failure, but it does not guarantee its success. There are often unresolved conflicting interests and varying degrees of participation among the various stakeholders. This is evident in the PPs implemented concomitantly with the Study.

Each Pilot Project (PP) was evaluated based on the indicators of the Project Design Matrix (PDM); i.e. activities, outputs, project purpose and overall goal, prepared at the beginning of each PP. Results of evaluation of each PP are summarised in Table 5.12.

Table 5.12 Results of the Implemented Pilot Projects

PPs	Relevance	Effectiveness	Efficiency	Impact	Sustainability
PP-I	<p>The overall goal and project purpose of PP-I, that is, the setting up of a Recycling Network Unit (RNU) and an Integrated Management System, is relevant to MHLG's policy to promote waste minimisation.</p>	<p>To be effective, information flow from the LAs and other stakeholders to MHLG needs to be constant. Further, the public needs to be able to access the information easily, e.g., via website, publications, to enhance networking amongst stakeholders. The PP may not be fully effective at the end of the project period due to insufficient manpower at MHLG. Notwithstanding that, considerable effort needs to be expended by MHLG to utilise the RNU and IMS that are already in place.</p>	<p>Though the RNU and IMS were in place, they can only be efficient if a permanent taskforce is in place to constantly update and manage information, monitor the stakeholders, and communicate with the public.</p>	<p>A more structured system to track the status of 3Rs was established under the PP. This would enhance the development of management skill of MHLG to capture the status of recycling in the country. The database created would provide greater and easier access to information to general public and stakeholders. Generally, it is anticipated the PP would contribute to the enhancement of 3Rs awareness among the public.</p>	<p>The database needs to be constantly monitored and updated. Therefore, the sustainability of PP-I is highly dependant on the will of MHLG to continue and to allocate adequate and suitably trained personnel to manage and maintain the system.</p>
PP-II-1	<p>Project purpose and overall goal for PP-II-1 is compatible to the needs of counterparts at the LA level that have/are embarking on programme to minimise their wastes.</p>	<p>The project purpose was partially achieved. Despite that, guidelines were drawn up as an outcome of the experience derived from the PP to assist and guide other LAs in setting up an RNU and to promote waste minimisation programme.</p>	<p>Considering the short duration of the pilot project period, the inputs were efficiently utilised to plan, negotiate and implement the project.</p>	<p>This project had a positive impact on the relevant parties, such as enhancement of network among stakeholders and 3Rs awareness among the public.</p>	<p>MPSJ and MBM recognised the WMU as a permanent component in their Council and the need to sustain the operation of that unit, i.e., data management, networking updating and monitoring, etc. However, to sustain WMU requires the support of the LA management and assignment of adequate and suitably trained personnel to manage and maintain the system.</p>

PPs	Relevance	Effectiveness	Efficiency	Impact	Sustainability
PP-II-2	<p>Project purpose and overall goal for PP-II-2 is compatible to the needs of counterparts, who are embarking on programme to minimise their wastes.</p>	<p>A source separation system for households was implemented, and the rate of participation and volume of recyclable waste collected increased, albeit marginally, over the duration of the pilot project. Whilst the participation rate was on the middle or higher side, except Krokop 6 in MBM, and, the PP served as a starting point for the LAs to proceed to other areas using the same approach and methodology.</p> <p>Meanwhile, the source separation programme at commercial establishments, i.e., mega-mart and hotel, encountered several problems in coordination and negotiation with stakeholders – issues beyond the control of the LAs and the Study Team. These issues subsequently led to significant delay in their implementation.</p>	<p>A lot of promotional and publicity work, through workshops, discussions, dialogues, exhibitions, brochures, pamphlets, etc. was undertaken to inform, educate and encourage the residents to participate in the programme.</p> <p>This approach was needed to reach out to the public.</p>	<p>This project had a positive impact on the relevant parties – e.g. a greater awareness on why and how to reduce waste, why and how to separate waste, what can be recycled and sold to recyclers, market value of recyclables, etc.</p> <p>The project also provided an opportunity for stakeholders to network with each other.</p>	<p>Sustainability of the project and the amount of recyclables collected within each LA rely largely on the continuous cooperation of recycling agencies and stakeholders. To maintain the amount of recyclables, it is suggested that LAs continue or intensify their public 3Rs campaign and programme.</p> <p>In MPPP, source separation might be expanded to more areas using MPPP's budget.</p> <p>In MBM, source separation has been introduced at other areas (Krokop 6) using MBM budget.</p> <p>In MPSJ, other apartment developments have expressed interest in initiating a similar programme and have requested MPSJ's assistance to coordinate as well as to fund the activity.</p> <p>Given the feedback expressed above, it is possible this PP can be sustained provided LAs provide the impetus, support, leadership and incentives.</p>

PPs	Relevance	Effectiveness	Efficiency	Impact	Sustainability
PP-III	<p>Considering the fact that MHLG has been conducting several activities targeted at school students under NRP, PP-III in Johor is compatible with MHLG's policy.</p> <p>The project purpose and overall goal of PP-III are compatible with the needs of counterparts, such as LA 21 Solid waste Reduction Group. PP-III provided the Group an opportunity to develop a programme for 3Rs award in Miri.</p>	<p>The project purpose has been fully achieved at the end of the pilot project.</p>	<p>Despite the time constraint, the 6 participating schools in Johor achieved significant results during the short project period primarily due to the eagerness of school teachers and their enthusiastic efforts.</p> <p>On the other hand, the PP in Miri encountered problems between Miri LA21 Solid Waste Reduction Group and JICA team due to misunderstanding over organisational roles and a line of communication that was relatively undefined. These problems caused significant delay in implementation of the project in Miri.</p>	<p>The project had great impact on the school teachers in Johor and MOE, who indicated its intention to extend the 3Rs programme to other schools in Johor and in future other states using the guidelines drafted in tandem with the PP. The appreciation given to the 6 participating school teachers from Johor at the Awards Ceremony in Miri. It will further encourage them to promote or sustain 3Rs activities in their schools, and possibly to act as "mentors" to other schools in Johor.</p> <p>With respect to Miri, the campaign conducted during this project also gave a positive impact on promotion of 3Rs activities among general public in Miri, as well as schools.</p>	<p>The LA 21 Solid Waste Reduction Group has started formulating a committee for the Award Ceremony in 2006. Whether the annual event can be sustained is dependent on whether the group might be able to secure financial aid or funding for the ceremony.</p> <p>Extension of the 3Rs programme to cover the rest of Johor and the other states in future is dependent on MOE, and availability of financial resources and aid.</p>

6. FINAL SEMINAR ON NATIONAL WASTE MINIMISATION STUDY IN MALAYSIA

The Final Seminar on the National Waste Minimisation Study in Malaysia was conducted on 1st and 2nd June 2006 at The Legend Hotel, Kuala Lumpur. It was organised jointly by the MHLG and JICA as a summarisation of the Study, and officiated by the Minister of Housing and Local Government.

The objectives of the Seminar were:

- To explain the scope of the Study that was undertaken;
- To introduce and present the output of the Study that include:
 - a) The Master Plan on National Waste Minimisation
 - b) The Action Plan on National Waste Minimisation
 - c) Guidelines for Source Separation, Formulation of Local Action Plan (LAP), Enhancement of 3Rs activities in school and 3Rs Action Guide (3RAG)
- To decide on the direction and to consolidate the concepts on how to implement the 3Rs on a national basis.

A total of 270 people attended the 2-day Seminar, most of whom were representatives from the Federal Government, State Government, 81 LAs, concessionaires, private waste management-related companies and NGOs.

The Seminar commenced with the Speech of the Minister of Housing and Local Government, Dato'Seri Ong Ka Ting. A brief introduction of the National Strategic Plan and the Master Plan and Federal Action Plan on Waste Minimisation was presented by MHLG, followed by a presentation on the experience in Japan by the Japanese Experts, and lastly, the experiences of the Model LAs in their formulation of the Local Action Plan and conducting of Source Separation Programme.

In tandem with the presentation session, an exhibition was held to introduce recycling activities by nine private companies, including a display of "Furoshiki" by the Japanese side.

The first session started with the Panel Discussion that was moderated by Prof. Sakurai, Okinawa University. The panellists include representatives from MHLG, EPU, DOE, NGO, experts on solid waste management, and representative from MoE, Japan and the Study Team. During the panel discussion, possible obstacles and countermeasure were raised and discussed among the panellists and participants. Among them, four points were stressed and agreed to be very important for the successful implementation of the waste minimisation programme in Malaysia. The points were the enhancement of awareness and education on waste minimisation, participation of every players, formulation of partnership between the stakeholders, and establishment of mechanism to support people's passion.

Encik Engku Azman bin Tuan Matt, the Director of Solid Waste Management Unit, MHLG closed the seminar by providing a summarisation of the discussion. Closing remarks were made by the Prof. Matsufuji and Y. Bhg. Dato' Haji Anwar b. Haji Abd. Rahman, Director General, Local Government Department, MHLG.

On the whole, the seminar saw good participation from all the players and good partnership or networking between all the players and stakeholders.

*The Study on National Waste Minimisation in Malaysia
Final Report - Summary*



Opening Ceremony



Opening Remarks by the Minister of MHLG



1st Day (approx. 270 Participants)



2nd Day (approx. 200 Participants)



Panel Discussion (End of 2nd Day)



"Furoshiki" Exhibition by Local Leaders



DG of MHLG and Seminar Organizers

Plate 6.1 Record of 4th (Final) Seminar (1st & 2nd June 2006)

7. RECOMMENDATIONS

To realise a *Material Cycle Society* in Malaysia, it is of great necessity to reduce waste generation at source, to minimise the amount of waste disposal at landfills and to maximise the efficiency of resource utilisation.

Meanwhile, the establishment of a “Sustainable Society” is the current international trend as declared in the Earth Summit in Rio de Janeiro in 1992 and the Johannesburg Summit in 2002, and waste minimisation is one of the key measures to achieve such a society.

In Malaysia, “Vision 2020”, declared in 1990, sets a challenge for Malaysia to become a fully developed nation by the year 2020, and to pursue environmental sustainable development as the basis for the development. Therefore, it can be said that the Malaysian government has a Global responsibility to establish an environmentally sustainable society, in line with the international trend.

Based on the above understandings, the Master Plan and Federal Action Plan on Waste Minimisation have been prepared. In line with the three (3) strategies of the Waste Minimisation Master Plan; i.e. “Enhancement of Awareness on Waste Minimisation”, “Strengthening of Partnership for 3Rs Activities” and “Enhancement of Institution to Strengthen Government Policies on Waste Minimisation”, it is recommended that MHLG take into consideration the key measures and recommendations of the Study.

RECOMMENDATION 1: AUTHORISATION OF WASTE MINIMISATION MASTER PLAN AND FEDERAL ACTION PLAN

The Waste Minimisation Master Plan and Federal Action Plan should be authorised with minimum delay by MHLG and implementation should start immediately thereafter.

Meanwhile, the “Solid Waste Management Act”, which will be the basic law on SWM in Malaysia, presently under preparation and examination by the related governmental agencies, should also be authorised and enacted in due time.

RECOMMENDATION 2: IMPROVEMENT OF THE NATIONAL RECYCLING PROGRAMME

The National Recycling Programme (NRP) organised and implemented by MHLG since the year 2000 is a good practice in Malaysia. In line with the Waste Minimisation Master Plan and Federal Action Plan, in order for the NRP to function more efficiently and widely, tools and programmes of the NRP including events of the National Recycling Day should be improved and continuously implemented. Recommended main programmes for the improvement of NRP are as follows:

- Nation-wide campaign on source separation
- Nation-wide promotion of eco-products and green purchasing
- Nation-wide award programme for the best 3Rs Community and/or best 3Rs Agency
- National children’s programme on 3Rs

RECOMMENDATION 3: NATION-WIDE PRACTICE OF SOURCE SEPARATION

Based on the following clarification and understanding, the Study recommends that “Source separation” be practised as a key measure for waste minimisation in Malaysia.

- Source separation will lead to a reduction in waste generation amount at source
- Source separation will lead to an increase in amount of materials to be recycled
- Once waste is separated at source in a certain manner, some segregated materials will cease to be termed wastes and referred to as valuables
- Once waste is separated at source, further measures on 3Rs will easily be introduced in the future

It is recommended that MHLG expand the source separation activities nation-wide in the following manner.

- Carry out a nation-wide campaign on source separation
- Prepare and implement a national annual plan for source separation
- Formulate a network amongst stakeholders at the LAs level

(As for Federal Action Plan on Partnership Activities on 3Rs including Source Separation, refer to Action-3, Chapter 5.)

RECOMMENDATION 4: STRATEGIC EDUCATION AND AWARENESS PROGRAMME

One of key factors in the establishment of a “Material Cycle Society” is in the development of an “Eco-lifestyle” through environmental education and teaching of the younger generation. The philosophy of conservation of resources through sustainable waste minimisation practices and habits should be inculcated into the younger generation via their education in the school and in their co-curricular activities.

In order to introduce and sustain a strategic education and awareness programme, joint collaboration of Ministry of Housing and Local Government (MHLG) and Ministry of Education (MOE) is essential. Therefore, the collaboration between the two Ministries in Pilot Project –III should be continued in future. Under this collaboration, the following strategic education and awareness programme should be introduced.

- Nation-wide dissemination of the “Guidelines for the Enhancement of 3Rs Activities in Schools”
- Formulation and implementation of 3Rs award programme for schools in LA, State and National level.

(Details of the Federal Action Plan on 3Rs Activities in Schools are discussed in Action-2, Chapter 5.)

RECOMMENDATION 5: CONTINUATION AND EXPANSION OF THE INFORMATION MANAGEMENT SYSTEM

MHLG should be the focal point of all information and data on 3Rs. MHLG established the “Recycling Information Centre” within the Ministry and the JICA Study carried out a pilot project involving ten LAs to establish data management system on solid waste management and 3Rs on the national level. This information management system should be continued and expanded to all LAs in Malaysia.

Furthermore, as shown in the pilot project, the response of the LAs to participate and provide meaningful data needs to be strengthened through efforts to explain the objectives of the IMS system, understand the obstacles facing some LAs to provide the required data, and simplify the data collection format to encourage participation from the LAs.

RECOMMENDATION 6: STRENGTHENING OF INSTITUTIONAL SYSTEM

MHLG should ensure that the recently established Recycling Networking Unit (RNU) should continue to function and be provided with the necessary staff and budget to sustain its activities.

It is recommended that a Waste Minimisation Promotion Committee be established to coordinate the efforts of the various federal and local government agencies and related stakeholders in the field of waste minimisation. MHLG should lead these efforts as a coordination body.

As clearly verified by each pilot project, there is a necessity to establish a Waste Minimisation Unit (WMU) in each local authority to function as a communication platform for all the related stakeholders and to serve as a focal point on 3Rs. MHLG should formulate the regulative mechanism to establish the WMU in the LAs. State Governments should also consider including waste minimisation duties within their present organisation and structure to oversee SWM activities.

The WMU will have the following major tasks.

- Enhancement of awareness on 3Rs by the general public together with MHLG
- Formulation of recycling players' networking at the local level
- Planning, coordinating and monitoring the source separation activities
- Operation of information management system (IMS) on SWM and recycling
- Base for the dissemination and sharing of information on 3Rs

It is also equally critical that adequate resources be allocated to each WMU so that the unit (with qualified and suitable personnel, funding and equipment) can discharge its role and tasks efficiently and effectively.

RECOMMENDATION 7: WASTE MINIMISATION AND PRIVATISATION

It is generally accepted that the promotion of waste minimisation and/or recycling would lead to a reduction of the amount of waste collected and disposed, and in consequence significantly affect current payment mechanisms to SWM companies and/or concessionaires in the country.

On the other hand, privatisation of SWM services is a developing trend in Malaysia, driven by government policy. Therefore, collaboration between the government and operating companies to promote waste minimisation practices within the privatisation framework should be established.

Based on this understanding, the following measures need to be considered for more effective promotion of waste minimisation in Malaysia.

- Recycling activities such as collection and treatment of recyclables and awareness activities may be partially provided by SWM companies and/or concessionaires.

- Means of payment to the SWM companies and/or concessionaires for their services need to be re-considered. For example, in addition to the present amount base payment, service-quality base payment also needs to be considered.
- Incentives for SWM companies and/or concessionaires to support waste minimisation and recycling need to be considered; i.e. provide subsidy for construction of recycling oriented facilities.
- Recycling targets set by concessionaires need to be considered to be linked to the mechanism of payment to them. (Based on the NSP, concessionaires should prepare the SWM master plan for their territory and set the recycling target.)