MOBILISING THE PUBLIC TO AVOID ILLEGAL DUMPING OF BULKY WASTE

ESTABLISHING SCHEDULED BULKY WASTE COLLECTION AND CIVIC AMENITY SITE - EXPERIENCES FROM SHAH ALAM AND MELAKA

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# Table of Contents

Abbreviations and Acronyms .......................................................... i
Foreword (Melaka) ................................................................. ii
Foreword (Shah Alam) ............................................................ iii
Message .................................................................................. iv
Introduction ............................................................................ 1

The Illegal Dumping Problem in Melaka and Shah Alam .......... 2

Principles of the Initiatives ...................................................... 3

Part A - Providing Scheduled Collection Service for Bulky Waste and Recyclables in Melaka ........................................... 4

Part B - Setting Up a Civic Amenity Site for Bulky Waste and Recyclables in Shah Alam .................................................. 14

Lessons Learnt, Sustainability and Expansion of the Bulky Waste Initiatives ................................................................. 24

Conclusion ............................................................................. 26

Bibliography ........................................................................... 27
# Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS</td>
<td>Civic Amenity Site</td>
</tr>
<tr>
<td>DANIDA</td>
<td>Danish International Development Assistance</td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Environment</td>
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<tr>
<td>JPSPN</td>
<td>Jabatan Pengurusan Sisa Pepejal Negara (Department of National Solid Waste Management)</td>
</tr>
<tr>
<td>MBMB</td>
<td>Majlis Bandaraya Melaka Bersejarah (Historical Melaka City Council)</td>
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<td>MBSA</td>
<td>Majlis Bandaraya Shah Alam (Shah Alam City Council)</td>
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<td>MHLG</td>
<td>Ministry of Housing and Local Government</td>
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<tr>
<td>mT</td>
<td>Metric Tonne</td>
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<tr>
<td>RE</td>
<td>Responsible Entity</td>
</tr>
<tr>
<td>RO-RO</td>
<td>Roll-On, Roll-Off</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
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<tr>
<td>UiTM</td>
<td>Universiti Teknologi MARA</td>
</tr>
</tbody>
</table>
Foreword (Melaka)

All over the world, illegal dumping is a major challenge for Local Authorities. From the residential area, bulky and green wastes are the common types of waste dumped illegally. In many cases, the key reason leading to rampant illegal dumping is often the lacking of an effective collection mechanism for households to dispose their bulky and green waste which does not fit into the normal domestic waste collection.

Historical Melaka City Council is committed to protect the environment and improve current solid waste management to deter illegal dumping. Illegal dumping pollutes the environment, affects the livelihood of residents and moreover, poses danger to the public health and safety. This costs the Melaka communities thousands of ringgits each year.

This publication documents the Community Initiative pilot project carried out in Melaka which involved setting up a scheduled bulky and green waste collection in selected housing areas in Melaka. The project was designed to test the effectiveness of setting up a regular collection system for bulky waste, green waste and recyclables.

The project involved the participation of residents as well as non-governmental organisations. This project aimed to create awareness among the residents about illegal dumping as well as providing a mean to enhance their participation in proper solid waste management.

I would like to thank the Ministry of Housing and Local Government as well as the Danish International Development Assistance (DANIDA) for supporting this project.

I encourage you to take the experiences gained from our community initiative and consider to set up similar initiatives in your own area if deemed fit.

DATUK YUSOF BIN JANTAN
Mayor
Majlis Bandaraya Melaka Bersejarah (MBMB)
Foreword (Shah Alam)

Shah Alam is a city known for its clean environment and well sustained development. Being the State Capital of Selangor, the city has been experiencing rapid growth and subsequently facing various urban environmental problems, including illegal dumping of solid waste.

A survey on illegal dumping in selected residential areas was carried out in early 2008 with the assistance from Universiti Teknologi MARA (UiTM) Malaysia. The survey revealed that around half of the illegally dumped solid waste are associated with bulky (furniture, mattresses, small renovation scrap, etc.) and green waste (trimmings, tree branches). MBSA spends a large amount of money to clean up waste dumped indiscriminately every month.

Taking a pro-active approach, MBSA decided to set up a Civic Amenity Site (CAS) as a mean for residents as well as small-scale contractors to send their own waste to a proper disposal facility within their neighbourhood. Apart from bulky and green waste, the CAS also accepts household hazardous waste (e.g. electronic waste), waste cooking oil as well as recyclable items.

This publication documents the process and experiences in setting up a Civic Amenity Site (CAS) to collect bulky waste, green waste and recyclables in Shah Alam of Selangor. Although the CAS has only been in operation for limited months, we have observed support and responses from the residents as well as other stakeholders, e.g. schools.

Through this report, we hope to share with you our experiences and hope that it would be useful for you to undertake similar initiatives in your area.

I would like to thank both the Ministry of Housing and Local Government and the Danish International Development Assistance (DANIDA) for the support provided to our project. Special thanks also goes to all the stakeholders involved in making this project possible.

DATO’ MAZALAN BIN MD. NOOR
Mayor
Majlis Bandaraya Shah Alam
(MBSA)
Message

Public participation and awareness are instrumental for improving the way we deal with our waste today. Waste reduction and recycling can only be successful if the authorities, the private sector and the public work together in unity for the better of the society.

In 2005, the Government of Denmark through the Danish International Development Assistance (DANIDA) has agreed with the Government of Malaysia to establish a fund to support Local Authorities who were committed to carry out such initiatives to increase public participation and awareness in solid waste management at the local level.

The fund was subsequently established in 2006 and the Local Authorities were requested to submit proposals for funding. The response from the Local Authorities was overwhelming and very encouraging. It was not easy for the Ministry and DANIDA to select the 10 initiatives among the large number of interesting and promising ideas which could be financed within the budgetary limits. The strong response is a clear demonstration of the commitment and enthusiasm towards saving resources and protecting the environment that exists in many Local Authorities and communities.

The initiatives selected include a very broad range of activities involving many parts of the society including residents, school children, hotels, restaurants, hawkers, tourists, just to mention a few. Meanwhile, the ranges of subjects are similarly broad including waste reduction, recycling, home composting, bulky waste management and cleanliness.

The fund has now come to an end and it is time to sum up the experience and the lessons learnt. Through a series of booklets, each initiative is presented and the experience and lessons learnt are documented.

It is my hope that the booklets will act as a source of inspiration for others. The booklets are made not only to facilitate replication of the initiatives but is also hoped that the booklets will inspire residents, communities and businesses to come up with different and new ideas to further increase the involvement of the society and the hope for a brighter future for all of us.

The present booklet presents one of the successful community initiatives – Establishing Scheduled Bulky Waste Collection and Civic Amenity Site - Experiences from Shah Alam and Melaka.

DATO’ NADZRI BIN YAHAYA, Ph.D
Director General
Department of National Solid Waste Management
Ministry of Housing and Local Government
Introduction

Used furniture and mattresses, broken television sets, refrigerators, building materials, packaging and branches piling up by the road side or at open grounds is very unsightly. This is, however, a very common and highly visible reality in many urban and rural areas throughout Malaysia.

Any unauthorised disposal of waste at public or privately-owned land is considered illegal dumping. Households, businesses, contractors and waste collectors who are not willing to travel the distance to proper disposal sites or to pay for the transport or tipping fees are all common offenders.

Waste types commonly found illegally dumped include:
• Used furniture and mattresses
• Household appliances and electrical goods such as washing machine, television, radio, computer
• Green wastes such as branches and trees stumps
• Construction wastes such as bricks and concrete
• Commercial and industrial waste such as packaging materials and off-cuts

Illegal dump sites tend to continue accumulating waste once the site has been used as an illegal dumping site and to reappear immediately after having been cleared.

Illegal dump sites are very un-aesthetic, being a very visible eyesore and creating an unpleasant environment. However, this is not the only problem with illegal dumping.

Illegal dumping can disrupt proper drainage areas, causing them to become more susceptible to flooding. Dumping can disturb vegetation and wildlife and it can contaminate soil, surface as well as ground water, giving rise to severe negative environmental impact.

In addition, illegal dump sites often become breeding ground for rodents, insects and vermins which may be disease-carriers. Besides, they also pose as a risk to people, especially children who enter the illegal dump sites might be exposed to physical injuries from sharp edges, protruding nails, etc. or to diseases through contact with infectious or poisonous materials.

Local Authorities spend huge sums every year clearing illegal dump sites, including cleaning up drains and rivers which are often clogged by illegally dumped waste. As much as RM 50 million may be spent by the Local Authorities every year on clearing illegal dump sites in Peninsular Malaysia.
The Illegal Dumping Problem in Melaka and Shah Alam

Melaka is a city of approximately 455,000 inhabitants, located on west coast of Peninsular Malaysia. Scheduled collection of bulky waste from the individual premises has not yet been introduced. Collection of bulky waste is, however, available for a nominal fee upon request to the appointed waste concessionaire.

Historical Melaka City Council (MBMB) collects about 900 metric tonnes (mT) of indiscriminately-dumped bulky waste each month by 2 private companies, contracted to remove bulky waste and clear illegal dump sites at a cost of RM 40,000 per month. Both contractors are required to perform random surveillance and to collect the illegally-dumped bulky waste within their respective area.

However, MBMB realised that continuous clearing of indiscriminately-dumped waste is haphazard and inefficient as the illegal dump sites tend to reappear as soon as the waste is removed.

Therefore, MBMB decided to test a more systematic approach, preventing illegal dumping of bulky waste by introducing a scheduled collection system while at the same time, fostering cooperation and increasing awareness among the households and businesses on the subject.

Shah Alam, the capital of Selangor state with approximately 584,000 inhabitants is experiencing a similar problem of illegal dumping. Numerous complaints from the public as well as from businesses have been lodged to Shah Alam City Council (MBSA) about illegal dumpsites. A survey done by Universiti Teknologi MARA (UiTM) Malaysia revealed that about half of the illegally-dumped solid waste in Shah Alam areas was bulky waste (such as furniture, mattresses, small renovation scrap, etc.) and green waste (such as trimmings and tree branches).

Enforcement and increased efforts to clean up the illegal dump sites have been unsuccessful in stopping such activities. Currently, MBSA spends about RM 136,000 monthly on private contractors to remove illegal dump sites.

Consequently, MBSA decided to adopt a different approach to combat illegal dumping. The council decided to establish an easily accessible Civic Amenity Site (CAS) where the waste generators are encouraged to deliver their bulky waste and garden waste instead of dumping them indiscriminately.
Principles of the Initiatives

Responding to the problem of illegal dumping, both councils decided to apply to the Solid Waste Management Community Initiatives Fund which is financed by the Danish International Development Assistance (DANIDA) in cooperation with the Ministry of Housing and Local Government (MHLG) for assistance to carry out community initiatives on combating illegal dumping. Both initiatives aim to create awareness among the local residents and businesses on preventing illegal dumping and to provide easily accessible legal avenues for proper disposal of the bulky waste.

The initiative in Melaka aimed to establish a scheduled collection system for bulky waste from both residential and industrial areas. Besides tackling the problem of illegal dumping, MBMB decided at the same time, to collect recyclables and promote recycling among the households. No additional charge was imposed for using the service. In line with MBMB’s ‘Team Up, Clean Up’ approach, the project has enhanced the networking between MBMB, waste generators, waste contractors, charity organisations and recyclers on proper solid waste management as a whole.

The objectives of the project were:
• To establish a scheduled collection service for bulky waste and recyclable materials in selected residential and industrial areas;
• To provide education and create awareness among the households and industries in proper handling of bulky waste and in recycling;
• To improve the overall cleanliness of the participating residential and industrial areas; and
• To evaluate the effectiveness of the project and assess the feasibility in incorporating the scheduled collection system into MBMB’s existing services.

On the other hand, the initiative in Shah Alam aimed to establish a CAS to provide an easily accessible means for the residents and businesses to properly dispose of their bulky and green waste as well as recyclable materials in order to reduce illegal dumping. By encouraging and educating people to utilise the CAS, it was the aim of MBSA to inculcate a more responsible behaviour to ensure a clean and healthy city.

The objectives of the project were:
• To establish a CAS for disposal of bulky waste, green waste and recyclable materials;
• To raise public awareness on the importance of proper waste disposal;
• To reduce the number of incidents of illegal dumping and improve cleanliness of the areas; and
• To encourage recycling among residents and the businesses.

In the following, the 2 community initiatives in MBMB and MBSA using different approaches to tackle illegal dumping are presented and discussed.
Part A - Providing Scheduled Collection Service for Bulky Waste and Recyclables in Melaka

PROJECT DESIGN AND IMPLEMENTATION FLOW

The initiative on Scheduled Collection of Bulky Waste and Recyclable Materials in Melaka started in May 2008 and completed in April 2009. The 12-month project received a grant of RM 155,000 from the DANIDA Solid Waste Community Initiatives Fund in addition to in-kind contribution from MBMB. The overall project flow is as shown in Figure 1 below:
A) PLANNING

Establish a Taskforce Committee

A taskforce committee was established in May 2008 with MBMB as the chairman. Other taskforce members include the residents’ associations, waste concessionaire company, waste contractors and charity organisations.

The main function of the taskforce was to make decisions concerning the project implementation. Regular meetings were held throughout the project to monitor the progress, discuss and troubleshoot whenever any problem occurs.

The main stakeholders and their respective roles in the project are summarised below:

| MBMB | • Coordinates and monitors the overall implementation of the project  
|      | • Chairs the taskforce committee and ensures input from the stakeholders for decision-making  
|      | • Maintains proper record of bulky waste and recyclable materials collected throughout the project duration  
| Concessionaire Company / Waste Contractors | • Conduct collection of bulky waste and/or recyclable materials following the planned schedule  
|      | • Dispose of the collected bulky waste to appropriate landfill and delivers the recyclable materials to appointed recyclers and charity organisations  
|      | • Assist MBMB in awareness-creation and dissemination of educational materials about the scheduled collection service  
| Charity Organisations | • Coordinate with MBMB to collect old clothes and used furniture that are still reusable and also recyclable materials along with the collection schedule  
| Recyclers | • Coordinate with MBMB to purchase the recyclable materials collected at agreeable prices  
| Residents’ Associations | • Inform residents about the scheduled collection and the importance of participation from residents  
|      | • Foster cooperation from the residents by timely dissemination of information on collection of bulky waste and recyclables prior to collection  
|      | • Cooperate with MBMB and other stakeholders to facilitate and implement the entire project |
Establish Scheduled Collection for Bulky Waste

A collection schedule was planned by the taskforce committee based on previous experiences of MBMB and input on the needs and expectations of the residents from other stakeholders, particularly the residents’ associations. It was decided that:

a) Collection frequency would be once in 2 months for most of the areas. However, collection would be carried out once a month in some selected areas to compare efficiency of the different frequencies.

b) Approximately 50 housing estates including some industrial areas that fall under the same housing estates would be covered.

Creating Awareness in the Selected Areas

Prior to the commencement of the scheduled collection, flyers were prepared and distributed to the residents and some nearby industries to notify them about the new scheduled collection service and types of waste to be collected.

This was done to enable the residents to prepare and bring out their bulky waste, green waste and recyclable materials on the collection day.

In addition, banners were hung across the entrance to the residential areas to notify residents and the general public of the activities taking place.
(B) IMPLEMENTATION

Implementing Bulky Waste Collection

The scheduled collection commenced on 3 May 2008, 1 month after the commencement of the initiative. The first month was used mainly for preparation and distribution of flyers. A total of 15 waste contractors were employed to perform the bulky waste collection from the 50 selected residential and industrial areas. Each appointed contractor was required to:

• Undertake collection 2 days per week at different areas, coming back to the same areas with 2-month interval; preferably on Saturday and Sunday where higher participation from the residents were expected
• Collect from 3 to 4 nearby residential and/or industrial areas per collection day with expected 12 trips to the landfill site per day

5-metric tonne lorries were deployed by the contractors for the purpose. Collection was conducted from 9.00am to 3.00pm on the collection days.

The types of bulky waste collected included:
• furniture (including mattresses)
• household appliances
• construction waste from minor renovation work
• tree trunks and branches

In addition, reusable old clothes and recyclable materials were also collected. The contractors were also required to clean up piles of illegally-dumped waste that were found along the collection routes.

The waste contractors were paid by MBMB and therefore, the waste generators neither need to pay for the service nor did they receive any incentive for giving away reusable items. However, they were encouraged to assist the waste contractors to handle and to load the bulky waste onto the collection vehicles in line with the ‘Team Up, Clean Up’ approach of MBMB.
Coordinate with Charity Organisations and Recyclers

Several charity organisations such as Buddhist Tzu Chi Association and recyclers were invited to join in the initiative for collecting recyclable materials as well as any bulky waste that were still usable in conjunction with the scheduled bulky waste collection. Collection points were set up at strategic sites along the collection route for the local residents to deliver their recyclable materials. In addition, some reusable bulky items and recyclable materials collected by the collection vehicles were also sent to these collection points. The recyclable materials collected were donated for charity and therefore, no monetary incentive was given to the residents. Proper record of weight and value of the recyclable materials were registered and submitted to the taskforce committee.

(C) MONITORING AND EVALUATION

An interview survey to evaluate and assess the level of public awareness and participation in the initiative was conducted on 30 and 31 May 2009 at 3 residential areas, namely Taman Kerjasama (983 households), Taman Bukit Beruang Utama (354 households) and Taman Melawis (111 households). The interview survey was carried out by a team of 4 surveyors. A total of 99 households were interviewed during the 2 days.
At the same time, on-the-ground inspection to determine the bulky and green waste generation rate within the household area covered by the project services was conducted.

The same team of 4 surveyors which undertook the interview survey was deployed for the ground survey. To determine the weekly generation rate, a collection vehicle was directed to cover the same area 3 times with one week interval. The involved households were informed on the special weekly collection through separate flyers. The surveyors followed the collection vehicle in a separate vehicle during the full collection day. Pre-survey of the collection route was performed by the team on the day before the actual survey to determine the number of households in the areas and to familiarise with the layout of the area. A standard recording form was used to record information on the area as well as on the bulky and green waste collection.

The activities performed by the collection vehicles during the collection day were observed. Detailed information on each heap of bulky waste collected or illegal dump sites cleared was recorded. GPS reading for each of the heaps was also taken. During the first survey day, the detailed route taken by the trucks was tracked. The total weight of the bulky waste collected was obtained from landfill weighbridge receipt. Photos and video-shooting of the collection were also recorded for documentation.

In addition to the surveys, the MBMB also performed technical and financial evaluation to compare the effectiveness of the scheduled collection system with the previous approach based on random surveillance and clean up of illegal dumps.
THE FINDINGS
(a) Interview Survey

A total of 99 households were surveyed. The interview surveys show that about 73% of the respondents were aware of the scheduled collection system. Moreover, 79% of the respondents agreed that the problems associated with illegal dumping would be reduced, if not resolved, if a bulky waste collection was implemented on regular basis. This indicates that the residents were positive about the effectiveness of the scheduled collection system to tackle illegal dumping.

Are you aware of the bulky waste collection service in the community?

- Yes: 73%
- No: 27%
- No answer: 7%

In your opinion, do you think the regular bulky waste collection will reduce the problem of illegal dumping?

- Yes: 79%
- No: 14%
- No answer: 7%
About 43% of the respondents replied that they helped the collection crews to handle and load the bulky waste into the collection truck. For those respondents who have not done so (57%), most of them (80%) informed that they would be willing to help the collection crews in the future whenever their assistance was necessary. About 3% of these residents replied that they would help only if the waste was not too heavy for them. 15% of them, however, answered that they would not assist in the collection under any circumstance.

All of the respondents claimed that they only required bulky waste collection from their house occasionally, usually once or twice per year; especially during festive seasons or during house cleaning. If an on-call service was in place instead of scheduled collection, 57% of them were interested in using such service. The remaining 42% discouraged such solution as they thought that it would be inefficient for the vehicle to come and collect the bulky waste from just the few households which have called. These respondents clearly preferred a scheduled collection with specific time, date and place for the collection.

In terms of willingness-to-pay for the collection service, the majority of the respondents were not willing to pay for a scheduled or an on-call service as they deemed that such service is part of the public collection system should be provided by the Local Authority (61%). However, about 25% of the respondents were willing to pay for the service as long as the payment was depending on the amount of waste collected. 14% of the respondents were willing to pay for the services without such conditions.
(b) On-the-Ground Inspection

Participation Rate

The participation rate of the residents was determined by counting the number of households with heaps of bulky and green waste placed in front of their houses on the collection day as compared to the total number of household being served by the collection route. Results from the 1st week collection were not included, as the waste may be accumulated for longer than 1 week. The results from 2nd and 3rd week are presented below:

<table>
<thead>
<tr>
<th>Survey</th>
<th>Number of waste heaps</th>
<th>No. of households covered</th>
<th>Participation rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Green</td>
<td>Bulky</td>
<td>Total</td>
</tr>
<tr>
<td>1 April 2009 - 7 April 2009</td>
<td>29</td>
<td>23</td>
<td>52</td>
</tr>
<tr>
<td>8 April 2009 - 15 April 2009</td>
<td>40</td>
<td>14</td>
<td>54</td>
</tr>
<tr>
<td>Average</td>
<td>34.5</td>
<td>18.5</td>
<td>53</td>
</tr>
</tbody>
</table>

The participation rate found ranges from 7% to 13% with an average of 10%. Green waste (trunks, branches, twigs, etc.) constituted approximately 65% of the heaps while other bulky waste constituted the remaining. This ratio is comparable to the distribution based on weight as registered at Krubong landfill where green waste is 75% while bulky waste is only about 25%.

(b) On-the-Ground Inspection

Waste Collection Rate

The bulky and green waste generation rate over 7 days was calculated by dividing the total weight of bulky and green waste collected with the total number of household served, considering 10% average participation.
Therefore, the average weekly generation rate (based on 10% participation for a weekly collection)
= (11.7 + 12.8) / 2
= 12.3 kg/house/week

Considering an average household size of 4.5 people, the average weekly bulky and green waste generation per person would be approximately 2.7 kg/cap/week or 0.4 kg/cap/day.

Taking the above generation rate into consideration, if the bulky waste collection is extended to the entire Melaka state with an estimated population of 700,000, an average of 8,190 mT of bulky and green waste is expected to be generated per month.

The results are presented below:

<table>
<thead>
<tr>
<th>Surveys</th>
<th>Weight of bulky &amp; green waste (kg)</th>
<th>Total number of households participated</th>
<th>Total number of households covered</th>
<th>Generation rate (kg/house/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 April 2009 - 7 April 2009</td>
<td>8,410</td>
<td>52</td>
<td>720</td>
<td>11.7</td>
</tr>
<tr>
<td>8 April 2009 - 15 April 2009</td>
<td>5,360</td>
<td>54</td>
<td>419</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Therefore, the average weekly generation rate (based on 10% participation for a weekly collection)
= (11.7 + 12.8) / 2
= 12.3 kg/house/week

Considering an average household size of 4.5 people, the average weekly bulky and green waste generation per person would be approximately 2.7 kg/cap/week or 0.4 kg/cap/day.

Taking the above generation rate into consideration, if the bulky waste collection is extended to the entire Melaka state with an estimated population of 700,000, an average of 8,190 mT of bulky and green waste is expected to be generated per month.

In 2007, Krubong landfill has only received approximately 1,100 mT of bulky and green waste per month or 13.4% of the total expected amount.

The ground survey pointed in the direction that limitation to bi-monthly or monthly collection and limitation of each of the 15 contractors to 3-4 neighbourhoods and 12 landfill trips for each collection day, as described above, was not sufficient to clear the areas. More frequent collection or increased collection capacity on the collection days would have given rise to higher amounts of bulky waste collected. The same conclusion was made for the areas with monthly collection.

Even during the weekly collection which was carried out during the above discussed ground survey, the truck size (5 mT) and limited daily number of trips to the landfill were observed to be insufficient and need to be further optimised.

Therefore, it can be concluded that the amount of disposed bulky waste has exceeded the expected amount considerably. In the future, the ideal collection schedule has to be organised to optimise collection frequency, size of truck and number of trips to the landfill. The above unit generation amount from the ground survey can be used as a minimum requirement for future planning for scheduled collection.
Part B - Setting Up a Civic Amenity Site for Bulky Waste and Recyclables in Shah Alam

PROJECT DESIGN AND IMPLEMENTATION FLOW

The initiative on establishing a Civic Amenity Site (CAS) for bulky waste and recyclable materials in Shah Alam started in August 2008 and completed in October 2009. The 15-month project received a grant of approximately RM 400,000 from the DANIDA Solid Waste Community Initiatives Fund while other expenditures such as waste tipping fees, labour and maintenance costs, approximately totaled up to RM 310,000 were borne by MBSA.

To ensure effective implementation of the project, MBSA appointed the private company, Semai Alam Sdn. Bhd. as the entity responsible for managing the project.
**A) PLANNING**

**Establish a Taskforce Committee**

A taskforce committee chaired by the MBSA was established upon commencement of the project. The committee consisted of the main stakeholders, including residents’ associations, waste concessionaire company, waste contractors, recyclers, second-hand dealers, UiTM, Department of National Solid Waste Management (JPSPN) and Department of Environment (DOE). The taskforce committee met regularly to discuss and decide the course of actions for the project with inputs from stakeholders.

| MBSA                                                                 | • Coordinates, evaluates and monitors the overall implementation of the project  
|                                                                      | • Chairs the taskforce committee to ensure that inputs from the stakeholders is obtained for evaluation and decision-making  
|                                                                      | • Monitors the performance of the Responsible Entity (RE)  
| RE - Semai Alam Sdn. Bhd.                                           | • Establishes, operates and manages the CAS in close cooperation with other stakeholders and ensure sustainability of the CAS  
|                                                                      | • Maintains proper record of all waste and recyclable materials delivered to the CAS throughout the project  
|                                                                      | • Prepares and submits the progress and monthly reports to the taskforce committee  
| Concessionaire Company and Waste Contractors                         | • Cooperate with the RE to conduct awareness talks as well as create publicity on the CAS to residents and businesses  
|                                                                      | • Transfer the waste from the CAS to the appropriate disposal site  
| Recyclers and Second-hand Dealers                                    | • Coordinate with the RE to collect recyclable materials from the CAS, including e-waste and furniture that can be recycled or reused  
| UITM                                                                 | • Advises the RE on the technical aspects of the CAS based on the findings from the preliminary survey concluded earlier  
|                                                                      | • Evaluates all the responses obtained from the residents and businesses about the CAS  
|                                                                      | • Assists the RE in the overall data management, analysis and reporting of the CAS  
| DOE                                                                  | • Advises the RE on matters related to the Environment Quality Act of Malaysia, including handling of scheduled waste in the set up and operations of the CAS  
| Residents’ Associations                                             | • Inform residents and businesses about the project and the CAS and the importance of participation to ensure success in implementation  
|                                                                      | • Foster cooperation from residents and businesses to participate in the activities and utilise the CAS through dissemination of awareness pamphlets  

A number of meetings in the taskforce committee were held to make the necessary decisions. The main decisions made by the committee are summarised below:

a) It was decided to locate the CAS at Section 17 of Shah Alam. The location was recommended by MBSA as land was available for the purpose there.
b) The CAS was aimed to serve residents from the adjacent Sections 16, 17, 18 and 24 of Shah Alam. Promotional activities were focussed on these 4 sections. However, residents from other areas were not restricted from using the CAS.
c) It was decided that the CAS would accept the following categories of waste:

- Garden waste / green waste
- Bulky waste (such as furniture and mattresses)
- Construction waste (in small quantity such as wood, bricks and tiles)
- Old clothes, bags and shoes
- Recyclable materials such as papers, plastics, metals, cardboard, etc.
- Other special wastes such as used tyres and used cooking oils
- Household scheduled waste (such as batteries, electronic and electrical wastes, expired medicine, used paint container, spray cans, etc.)

d) Consent from DOE was acquired for the reception of the household scheduled waste.

**Construction of the CAS**

A 3.5-acre plot of land at Section 17 was allocated for the CAS. The site development work included pavement of the entire site, building the access road, waste inspection area, waste storage area including waste un-loading bays, open containers for the individual bulky waste types and shelter for special and scheduled waste and site office. The physical establishment of the CAS took about 3 months, including the land clearance, construction and the purchase of necessary equipments.
The CAS was equipped with the following facilities and infrastructure:

- 12 units of skip/Roll-On, Roll-Off (RO-RO) containers (inclusive of 1 spare unit) for bulky waste, green waste, construction and demolition waste
- 2 units of closed cabins with shutter doors for e-waste and household scheduled waste (used batteries, fluorescent lights, aerosol cans, containers for pesticides and other household hazardous waste)
- 10 units of 660-litre communal bins for recyclable materials (aluminium, papers, plastics, metals and glass) and used clothes/textiles
- Shelters and racks for scheduled waste
- Lamp posts, electricity and water supply
- Internal signboards for users
- Security post and brick walls at entrance, with metal decks for parameter fencing and sliding gate and clear signboard specifying types of waste acceptable by the CAS
- Security device for the CAS, including spotlights and CCTV devices

**Awareness Campaign to Promote the CAS**

A preliminary awareness survey of the targeted area (Section 16, 17, 18 and 24 of Shah Alam) was carried out with assistance of UiTM Malaysia. Notification was made to the targeted area via the respective residents’ associations to minimise the resistance of getting the responses from the households. A total of 319 households were interviewed.
The awareness survey revealed that:

- A majority of the respondents was aware of illegal disposal of bulky waste
- More than 50% of the respondents believed that the main reasons of illegal disposal by residents were lack of proper disposal facilities and laziness to move bulky waste for a longer distance
- Around 20% of the respondents indicated that a common method to dispose of their bulky household items (e.g. furniture and mattresses) was to place them in open spaces within their neighbourhood. Another 20% would place them in front of their houses or fences
- Around 40% of the respondents believed that it was not their responsibility. It should be the duty of MBSA subsequently to clear the randomly-disposed bulky waste
- 58% of the respondents indicated that the best method to dispose of bulky waste was to dispose in public waste bins provided by MBSA
- 87% were agreeable to the setting up of CAS
- More than half perceived that possible future fees for bulky waste disposal should be less than RM 10 per month

The survey made it clear to MBSA that easy access to proper disposal facilities and massive awareness campaigns were required to change attitudes and behaviour.

Educational talks were organised by MBSA at Sections 16, 17, 18 and 24 with the assistance from the respective residents’ associations and concessionaire company to promote the CAS and familiarise the participants with the operational procedures of the site.

Prominent signboards with information regarding the CAS were placed at strategic locations in all the 4 sections such as at hypermarts. In addition, the CAS was highlighted in radio (Radio Selangor) and in newspaper articles (The Star, Berita Harian and Utusan Malaysia).
Flyers were distributed to households, schools and mosques and banners were placed near night markets to inform the public about the CAS.

- Newspaper Release about the CAS

- Design of Pamphlet Distributed about the CAS

- Design of Poster about the CAS
(B) IMPLEMENTATION

Operation of the CAS

The CAS was opened to the public on 15 July 2009. The site is opened from Tuesday to Sunday with operating hours from 9.00am to 6.00pm on weekdays (Tuesday to Friday), 9.00am to 8.00pm on weekend (Saturday and Sunday) and subsequent housekeeping and cleaning of the site will be from 6.00pm to 8.00pm. Within the 2 hours, maintenance works as well as segregation of recyclable materials is conducted. A security team is stationed at the CAS to manage the security and safety of the CAS at non-operating hours (6.00pm – 9.00am).

Residents and business entities from all sections of Shah Alam are allowed to access the CAS and deliver their waste, using own transportation as long as the waste types delivered are acceptable by the CAS. On-call collection service of bulky materials was also provided during the initiative but it was only available for free to the residents in Sections 16, 17, 18 and 24. Requests from other areas were subjected to a minimal charge calculated according to the distance to the CAS.

Upon arrival at the CAS, all incoming waste will be inspected by the CAS operator to ensure that only acceptable waste is delivered to the site. The types and the estimated weight of the waste are recorded based on the truck size. The vehicle will be given instruction where to unload the waste. A site supervisor is posted at the unloading bays to assist and ensure that the waste is unloaded at the right place.

When any of the bins or containers is full, the appointed waste contractor or recycler will be asked to collect the container for transportation to the disposal site or for purchase of the recyclables. The costs for transport and disposal and the income from the sales of recyclable materials are managed by Semai Alam Sdn. Bhd. under a separate account for the operation of the CAS.

Household scheduled waste is stored at a roofed shelter according to the requirements of the DOE. The collected e-waste will be sold to licensed buyers for recovery purpose while other household scheduled waste will be disposed of to Kualiti Alam when the waste has reached a certain amount.
(C) MONITORING AND EVALUATION

Materials Received

Since the opening of the CAS, the responses from the public was closely monitored and the amount of materials delivered to the facility was recorded. A summary of the figures achieved by the CAS from 15 July 2009 to 30 March 2010 is given below:

a) Number of customer : 31

b) Mode of transportation:

<table>
<thead>
<tr>
<th>Types of Vehicle</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>175</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>38</td>
</tr>
<tr>
<td>Lorry</td>
<td>19</td>
</tr>
</tbody>
</table>

c) Type of waste received:

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Bulky waste</td>
<td>35,000</td>
</tr>
<tr>
<td>2) Construction waste</td>
<td>1,500</td>
</tr>
<tr>
<td>3) Green waste</td>
<td>10,000</td>
</tr>
<tr>
<td>4) Recyclables</td>
<td></td>
</tr>
<tr>
<td>Plastic</td>
<td>5,500</td>
</tr>
<tr>
<td>Glass</td>
<td>2,800</td>
</tr>
<tr>
<td>Steel/Metal</td>
<td>3,000</td>
</tr>
<tr>
<td>Paper</td>
<td>8,000</td>
</tr>
<tr>
<td>5) Fabric</td>
<td>800</td>
</tr>
<tr>
<td>6) Shoes</td>
<td>200</td>
</tr>
<tr>
<td>7) Rubber (used tyres)</td>
<td>700</td>
</tr>
</tbody>
</table>

d) Household scheduled waste:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used oil container</td>
<td>400 L</td>
</tr>
<tr>
<td>E-waste</td>
<td>282</td>
</tr>
<tr>
<td>Others</td>
<td>88</td>
</tr>
</tbody>
</table>
Some photos showing the types of waste delivered to the CAS are shown below:

- Bulky Waste
- Cardboard and Paper
- Scrap Metals
- Garden Waste
- Scrap Tyre and Rubber
- E-waste
- Wood Waste
- Clothing & Shoes
- Waste Sent to Landfill Site
Waste Sent to Landfill

The quantity of waste transferred from the CAS to landfill site for the months of October 2009 to March 2010 were recorded based on the weighbridge measurement at the landfill site. Each month, 4 trips were made to the landfill with a total waste amount of about 67.74 mT over the 6 months.

<table>
<thead>
<tr>
<th>Months</th>
<th>Trip 1</th>
<th>Trip 2</th>
<th>Trip 3</th>
<th>Trip 4</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>3.04</td>
<td>2.68</td>
<td>2.02</td>
<td>1.47</td>
<td>9.21</td>
</tr>
<tr>
<td>November</td>
<td>1.18</td>
<td>2.45</td>
<td>2.77</td>
<td>4.22</td>
<td>10.62</td>
</tr>
<tr>
<td>December</td>
<td>1.76</td>
<td>2.49</td>
<td>2.14</td>
<td>2.58</td>
<td>8.97</td>
</tr>
<tr>
<td>January</td>
<td>2.23</td>
<td>3.01</td>
<td>3.21</td>
<td>3.30</td>
<td>11.75</td>
</tr>
<tr>
<td>February</td>
<td>3.52</td>
<td>3.45</td>
<td>3.66</td>
<td>3.50</td>
<td>14.13</td>
</tr>
<tr>
<td>March</td>
<td>3.22</td>
<td>3.60</td>
<td>2.80</td>
<td>3.44</td>
<td>13.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>67.74</strong></td>
</tr>
</tbody>
</table>

Enquiries Received

The number of enquiries received from the public about the CAS was registered as another indicator to monitor the public interest. A total of 30 enquiries were received during the 3-month period from July to September 2009. The majority of the enquiries asked about the types of waste that can be delivered to the CAS (46%). Another 39% enquired about the location of the CAS and means of transportation, etc.

Status for Participation

The use of the CAS by the public is still at a modest level. This was an expected scenario. Experiences from establishing CAS world-wide show the same trend with modest participation at the initial stage. Campaigns on proper disposal of bulky waste can only be initiated when proper means of disposal is already made available to the public. It then, requires longer time for the public to accept the idea and gets familiar to making use of the facility. It is challenging to change people’s mind-set, attitudes and habits on solid waste management. Continuous efforts to promote and publicise the CAS will hopefully increase the participation from the public over time.
Lessons Learnt, Sustainability and Expansion of the Bulky Waste Initiatives

The community initiatives in MBSA and MBMB represent different ways to reduce illegal dumping of bulky waste and improve cleanliness of the cities. Both the initiatives offer a solution for the waste generators to properly dispose of their bulky waste and recyclable materials. The initiatives, however, require commitment and participation from the public, either to deliver the waste to the CAS or to bring out the waste for collection following a fixed schedule.

The participation rates in both MBMB and MBSA are still modest. The experience from the initiatives indicates that it requires longer time to change people’s habits and attitudes. Nevertheless, the projects have provided means for the public to act properly and reduce illegal dumping in the 2 cities. Participation will have to be increased gradually through continuous efforts on awareness-creation and dissemination of information.

Sustainability is therefore, a crucial issue to allow a longer period of time for people’s habit to start changing. The following activities are possible means to increase participation and ensure sustainability of the initiatives:

For scheduled collection service:

1. To continuously prepare and distribute flyers to residents prior to the collection day to inform them about the scheduled collection system
2. To make information about the scheduled collection system available online for the public
3. To establish a call centre at MBMB to receive enquiries and comments for future improvements of the scheduled collection system
4. To organise awareness talks and campaigns as well as gotong-royong activities together with the local communities
5. To hold regular meetings with the residents’ associations and any other stakeholders to obtain more public comments about the scheduled collection system and to discuss on any issue faced by the public

For CAS:

1. To continuously prepare and distribute flyers to the local residents to inform about the CAS and provision of hotline for the service
2. To develop a Standard Operating Procedure (SOP) for the CAS to ensure effective operation of the CAS following specifications and expectations of MBSA, the taskforce committee as well as the public
3. To collaborate with mass media in promoting the CAS
4. To organise awareness talks and campaigns to the local communities
5. To hold regular dialogues and meetings with the residents’ associations for constructive comments and ideas for improvement of the CAS
Both the community initiatives in MBSA and MBMB are expected to be expanded gradually to cover larger areas. MBMB plans to expand the scheduled collection gradually to cover more areas of the city. MBSA similarly plans to establish more CAS to cover other areas of the city.

The challenges and key lessons learnt documented above should be taken into account for the duplication along with some other important factors as follow:

**a) The coverage of initiatives**
Strategic location and accessibility of the CAS is a crucial factor for ensuring active participation from the residents. Therefore, location of future sites should be carefully assessed before decisions are made.

**b) Awareness creation activities**
It was learnt from both the initiatives in MBMB and MBSA that awareness creation must be a continuous effort. As both the CAS and the scheduled collection service are still new to the residents, promotional activities need to be carried out regularly. It was learnt that the residents tend to lose their interests in the CAS or forgot about the scheduled collection service if continuous publicity was not made on the initiatives.

The awareness creation or promotional activities should be expanded to encompass a wider range of channels such as activities for school children which may bring the experience home to the parents, mass media, places of worship, etc.

**c) Networking with the stakeholders**
The supports from the stakeholders are important factors to ensure successful implementation of the initiatives. Networking with the relevant stakeholders should be maintained and enhanced. Possible rewards or recognitions to the stakeholders should be considered to encourage the continuous efforts to support the initiatives.

**d) Commitments from all parties**
Experience learnt from the initiative in Melaka indicates that close monitoring of the performance of the contractors is required. The contractors were sometimes; found not utilising the truck capacity fully before going to the disposal site. If more effective collection were carried out by the contractors, less contractors would be required or wider areas could be served by the contractors. This issue becomes more pertinent as most of the collection take place on Saturday and Sunday, implying that monitoring staff would have to be deployed during weekends.

Similar experience was learnt from the initiative in MBSA. The operation of the CAS needs to be closely-monitored to ensure the SOPs are followed.
Conclusion

Having either the CAS or scheduled collection is expected to reduce the incidents of illegal dumping, especially when the waste generators (both residents and industries) are becoming familiar with and getting used to these systems.

Although the participation rate at the moment was still modest, the surveys in Melaka have shown that most of the residents were aware of the scheduled collection system and believe that the implementation of the scheduled collection system will improve the overall situation of illegal dumping in their areas. The survey in Shah Alam has shown that the residents were agreeable to introducing the CAS. Shah Alam has further, received many enquiries about the facility. All these experiences show the interests by the residents in the new systems and raise the expectations that the new systems will achieve the objectives to improve the overall cleanliness of their areas.

However, the survey in Melaka made it clear that the majority of the people were not willing to pay for the new systems introduced although most of them revealed that they were willing to participate in the scheduled collection. The survey in Shah Alam showed an expectation of a future maximum payment of RM 10 for bulky waste.

Changing people’s mind-set and attitudes is a challenging task and long time is required to achieve such changes. Therefore, continuous dissemination of information about the systems through various channels is very important.
Bibliography
