Solid Waste Management and Composting in Sibu

SIBU MUNICIPAL COUNCIL,
SIBU, SARAWAK, MALAYSIA

JICA
Kyushu International Centre
29 June 2011
Sibu – Gateway and Regional Centre of Central Sarawak, Malaysian Borneo
Present Sibu Town

Area under the jurisdiction of Sibu Municipal Council: 129.5 Sq km
Population: 162,348
Overview of SWM

Revenue collected by Sibu Municipal Council for waste collection for year 2010:- RM3.5 million
- Based on the 4% ARV (Assessment Rate/year)

Expenditure for solid waste management for year 2010:- RM5 million, which included RM310,020.00 for leachate treatment plant, RM948,112.00 for sanitary landfill and the rest Payment for refuse collection (4 contractors)
Waste Management

• Divided into 4 zones, therefore 4 contractors
• Collect on domestic and commercial waste
• Collection schedule:-
  - Residential areas:- 3 times a week
  - CBD areas & markets:- twice a day
  - Other commercial areas: once a day
• Disposed at Kemunyang Sanitary Landfill
SANITARY LANDFILL AT KEMUNYANG

Locality- Approximately 26 km from Sibu town and is accessible via Jalan Kemunyang.

Cost of the Project- 8 Millions (RM) (operational in 2001)

Land Coverage Area- Approximately 13 Acres
Capacity

Cell 1 = 60,000 cu m
Cell 2 = 37,000 cu m
Cell 3 = 28,000 cu m
Layer 2 (14 m - 19 m) = 81,000 cu m
Layer 3 (19 m - 24 m) = 39,000 cu m
Layer 4 (24 m - 29 m) = 11,000 cu m

Total: = 256,000 cu m

Life Span = 10 Years
<table>
<thead>
<tr>
<th>YEAR MONTH</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>4,502.52</td>
<td>4,091.96</td>
<td>3,727.22</td>
<td>4,720.34</td>
<td>5,727.24</td>
<td>5,418.89</td>
<td>4,388.70</td>
<td>4,535.37</td>
<td>5,254.32</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>3,229.13</td>
<td>2,834.32</td>
<td>3,174.31</td>
<td>4,132.09</td>
<td>4,196.90</td>
<td>4,583.21</td>
<td>3,978.00</td>
<td>3,628.73</td>
<td>4,362.78</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>2,943.16</td>
<td>3,073.84</td>
<td>3,451.61</td>
<td>3,735.10</td>
<td>3,847.16</td>
<td>3,824.10</td>
<td>3,701.97</td>
<td>3,861.28</td>
<td>4,034.58</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>2,982.61</td>
<td>3,170.12</td>
<td>3,391.28</td>
<td>3,400.13</td>
<td>3,604.95</td>
<td>3,595.16</td>
<td>3,595.23</td>
<td>3,789.14</td>
<td>3,844.79</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>3,073.41</td>
<td>3,250.52</td>
<td>3,679.77</td>
<td>3,613.33</td>
<td>3,839.74</td>
<td>3,669.87</td>
<td>3,534.43</td>
<td>3,989.60</td>
<td>3,928.66</td>
<td></td>
</tr>
<tr>
<td>Jun</td>
<td>2,854.83</td>
<td>3,199.92</td>
<td>3,363.06</td>
<td>3,381.20</td>
<td>3,524.21</td>
<td>3,342.34</td>
<td>3,352.16</td>
<td>3,727.81</td>
<td>3,795.59</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>2,962.32</td>
<td>3,228.38</td>
<td>3,644.45</td>
<td>3,617.83</td>
<td>3,717.97</td>
<td>3,736.35</td>
<td>3,534.49</td>
<td>3,863.52</td>
<td>3,911.33</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>2,929.51</td>
<td>3,218.91</td>
<td>3,582.21</td>
<td>3,520.13</td>
<td>3,768.63</td>
<td>3,617.31</td>
<td>3,530.12</td>
<td>3,930.05</td>
<td>3,919.83</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>2,909.49</td>
<td>3,288.43</td>
<td>3,379.51</td>
<td>3,614.24</td>
<td>3,674.10</td>
<td>3,527.44</td>
<td>3,723.68</td>
<td>3,982.40</td>
<td>3,605.86</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>1,581.07</td>
<td>3,232.09</td>
<td>3,562.26</td>
<td>3,465.46</td>
<td>3,936.78</td>
<td>3,816.58</td>
<td>3,819.12</td>
<td>4,614.57</td>
<td>4,393.17</td>
<td>3,608.67</td>
</tr>
<tr>
<td>November</td>
<td>3,332.28</td>
<td>3,480.21</td>
<td>4,179.93</td>
<td>4,127.41</td>
<td>3,818.72</td>
<td>3,716.37</td>
<td>3,642.77</td>
<td>4,496.42</td>
<td>4,636.08</td>
<td>3,935.22</td>
</tr>
<tr>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>9,759.49</strong></td>
<td><strong>39,876.52</strong></td>
<td><strong>41,055.83</strong></td>
<td><strong>44,372.14</strong></td>
<td><strong>45,503.81</strong></td>
<td><strong>48,225.73</strong></td>
<td><strong>47,532.01</strong></td>
<td><strong>46,714.64</strong></td>
<td><strong>49,165.51</strong></td>
<td><strong>48,344.93</strong></td>
</tr>
</tbody>
</table>

**TOTAL TONNAGE UP TO DATE = 420,550.61**
Monthly waste disposed at Kemunyang Sanitary Landfill, Sibu from 2001 up to date

Total tonnage up to date = 420,550.61
Population Served = 162,348
Sanitary Landfill at Kemunyang. Refuse Composition [ By Weight ]

<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
<th>Percent [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organic matters</td>
<td>49.50</td>
</tr>
<tr>
<td>2</td>
<td>Plastic</td>
<td>14.50</td>
</tr>
<tr>
<td>3</td>
<td>Paper</td>
<td>10.51</td>
</tr>
<tr>
<td>4</td>
<td>Paper Carton</td>
<td>8.80</td>
</tr>
<tr>
<td>5</td>
<td>Textile Waste</td>
<td>5.20</td>
</tr>
<tr>
<td>6</td>
<td>Glass</td>
<td>3.80</td>
</tr>
<tr>
<td>7</td>
<td>Ferrous Material</td>
<td>3.40</td>
</tr>
<tr>
<td>8</td>
<td>Rubber</td>
<td>2.80</td>
</tr>
<tr>
<td>9</td>
<td>PVC</td>
<td>1.20</td>
</tr>
<tr>
<td>10</td>
<td>Polystyrene</td>
<td>0.10</td>
</tr>
<tr>
<td>11</td>
<td>Aluminium</td>
<td>0.10</td>
</tr>
</tbody>
</table>
Waste Characterization

- Organic matters: 49.50%
- Plastic: 14.50%
- Paper: 10.51%
- Paper Carton: 8.80%
- Textile Waste: 5.20%
- Glass: 3.80%
- Ferrous Material: 3.40%
- Rubber: 2.80%
- PVC: 1.20%
- Polystyrene: 0.10%
- Aluminium: 0.10%
National Recycling Program

• Launched in SMC on **23 June 2011**
• 66 sets of three coloured recycling bins were distributed to schools, commercial centres, petrol stations and put at public places.
  - Brown for glass
  - Blue for paper
  - Orange for plastic & aluminium
# Recycling – Aluminium Cans

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Amount Collected (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>756</td>
</tr>
<tr>
<td>2009</td>
<td>1932</td>
</tr>
<tr>
<td>2010</td>
<td>1100</td>
</tr>
<tr>
<td>Jan – April 2011</td>
<td>161</td>
</tr>
</tbody>
</table>
# Recycling – Old Newspaper (ONP) and Mixed Paper

<table>
<thead>
<tr>
<th>Year</th>
<th>ONP</th>
<th>Mixed Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>150,312</td>
<td>3,823</td>
</tr>
<tr>
<td>2009</td>
<td>132,279</td>
<td>2,092</td>
</tr>
<tr>
<td>2010</td>
<td>113,952</td>
<td>1,537.5</td>
</tr>
<tr>
<td>Jan – April 2011</td>
<td>33,502</td>
<td>13,993</td>
</tr>
</tbody>
</table>
Journey to Community Composting

- Started in 2008 (conventional method)
- Pilot projects in 2 residential neighborhoods and 2 secondary schools
- Activities
  - Briefing, demonstration, free compost bins, follow up inspection
  - Communal composting centre (Market hawkers and schools)
- JICA, under JICA Partnership Program (JPP)
  “Community-based Solid Waste Management System Development Project in Sibu Municipality assisted SMC in promoting THMC.”
• Under JPP, experts from Japan were dispatched to Sibu:-
  - December 2009 – Regional Workshop
  - July 2010 – Follow up visit
  - November 2010 – Seminar and follow up visit to composting centre/households
  - February 2011 – Technical Workshop/Seminar
• Budget allocation (under Local Agenda 21):-
  - Municipal
  - Federal government
  - No cost/benefit analysis done at the moment.
许赞麒：减少垃圾

菜市场推行高碳堆肥法

（本报访问6日文）为提升菜市场环保意识的
措施，政府建议会合在
菜市场推行堆肥法，于
明日开始实验计划。

市长访问菜市场，并推广堆肥法。

市长说，菜市场推行堆肥法
是提升环保意识的重要措施，
希望市民能积极参与。

菜市场推行堆肥法

（本报访问6日文）为提升菜市场环保意识的
措施，政府建议会合在
菜市场推行堆肥法，于
明日开始实验计划。

市长访问菜市场，并推广堆肥法。

市长说，菜市场推行堆肥法
是提升环保意识的重要措施，
希望市民能积极参与。

菜市场推行堆肥法

（本报访问6日文）为提升菜市场环保意识的
措施，政府建议会合在
菜市场推行堆肥法，于
明日开始实验计划。

市长访问菜市场，并推广堆肥法。

市长说，菜市场推行堆肥法
是提升环保意识的重要措施，
希望市民能积极参与。
Small Composting Centre at Seng Ling Road, Sibu
Small Composting Centre at Seng Ling Road

- 20-50 kg of green waste (vegetables, fruits, etc) collected daily from Sibu Central Market, Rejang Park Market

- Usage of compost:- door gift, exchange, used as seed compost

- Challenges:- segregation of waste, shredder, cooperation from the hawkers/contractors, manpower