Mandalay City Report on Solid Waste Management
Mandalay City Area

- Located on the eastern bank of the Ayeyarwady River in the middle portion of the Central Myanmar
- Composed of six townships namely: Aungmyaytharzan, Chanayetharzan, Mahaungmyay, Chanmyathasi, Pyigyitagun and Amarapura townships
- Total area of the City is about 44.59 Square Miles (115.4876 Squares Kilometers)
- Population is 1.46 millions
- Mandalay has become one of the most developed economic centre for the commerce, agriculture, industry and tourism.
Solid Waste Management

- Daily refuse generation is gradually increased in these years because of the increasing population, urbanization and economical development.
- Waste generation rate is about 0.4 to 0.45 kg/capita/day.
- Daily collection of waste from the whole city is more than 800 tons.
- Responsible by Cleansing department.
- Cleansing department is currently public ownership and operates vehicles provided by the department of Motor, Transport and Workshop.
- By >2000 of man power using 183 trucks, 153 tri-bikes and > 350 push carts.
Final disposal sites

- 17.5 km far from City Hall
- 12.5 Acres collected by purchasing from private owners.
- 450 Tons/day of MSW
- 1.Feb.2010 till now

D1 – Northern dumpsite

Transfer zone

D2 – Southern dumpsite
PRIMARY COLLECTION

- Door to door collection
- Container collection
- Open collection points

SECONDARY COLLECTION

- Mainly performed on available public area
- Points within the center of urban areas are located at bus-stations or connection roads and drains
- Reallocation of secondary collection points into periphery areas is a need
- Mainly performed with dumpers and closable containers and is very labour intensive
## Comparative Statement of Cleansing Department By Yearly

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste Collection Tons/day</th>
<th>Workers/Employee</th>
<th>Collection Vehicles</th>
<th>Tri-bikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>259.93</td>
<td>911</td>
<td>71</td>
<td>-</td>
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<tr>
<td>2006</td>
<td>288.06</td>
<td>1172</td>
<td>71</td>
<td>-</td>
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<tr>
<td>2007</td>
<td>277.34</td>
<td>1196</td>
<td>73</td>
<td>-</td>
</tr>
<tr>
<td>2008</td>
<td>262.75</td>
<td>1085</td>
<td>73</td>
<td>-</td>
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<tr>
<td>2009</td>
<td>281.46</td>
<td>1021</td>
<td>76</td>
<td>-</td>
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<tr>
<td>2010</td>
<td>473.61</td>
<td>1140</td>
<td>86</td>
<td>20</td>
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<tr>
<td>2011</td>
<td>404.23</td>
<td>1083</td>
<td>116</td>
<td>90</td>
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<td>2012</td>
<td>550.54</td>
<td>1244</td>
<td>173</td>
<td>150</td>
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<tr>
<td>2013</td>
<td>779.04</td>
<td>1942</td>
<td>183</td>
<td>153</td>
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<tr>
<td>2014</td>
<td>850.00</td>
<td>2137</td>
<td>183</td>
<td>153</td>
</tr>
</tbody>
</table>
Vehicles

- 153 No
- 350 No
- 20 No
- 10 No
- 138 No
- 150 No
- 3 No
Waste analyses results in comparison

- Plastics: 20.00% (Sep-12), 10.00% (Jul-13)
- Paper: 12.00% (Sep-12), 6.00% (Jul-13)
- Wood/Bamboo: 4.00% (Sep-12), 2.00% (Jul-13)
- Rubber: 1.00% (Sep-12), 0.50% (Jul-13)
- Metal: 0.50% (Sep-12), 0.25% (Jul-13)
- Glass: 3.00% (Sep-12), 1.50% (Jul-13)
- Vegetables/Leaves/Kitchen: 50.00% (Sep-12), 25.00% (Jul-13)
- Drainage Sludge/Clay/Dust: 3.00% (Sep-12), 1.50% (Jul-13)
- Clothes/Textile: 0.50% (Sep-12), 0.25% (Jul-13)
- REUSE
  - reuse bottles in factories (private business)

- RECYCLE (Plastics)
  - recycling the plastic bags and bottles to dust bins, traffic cones, etc.

- RECYCLE (Tin and Can) – Private business

Collecting
washing
melting

Collecting
Compressing
Smelting

Modeling
products
(MCDC property)

Modeling
Products (iron rods)
Challenges

- Co-operation, awareness, and active participation of public is still weak in Solid Waste Management system
- Insufficient budgets, workers, modernized trucks & equipment and improper collecting vehicles
- Long track from city to landfill areas and less transfer station
- Increasing population and increasing solid waste generation year by year – migration from other areas and inadequate housing
- Public Poverty
- Increasing roadside shops and illegal tenant
- No proper staffs training
- Lack of symposiums, seminars, exhibitions for proper solid waste management
- Lack of research program for solid waste management
- Lack of proper town plan for new satellite townships
- Lack of private organization and company for recyclable products and EPR (extensive product responsibilities)
- Rodents and insect vectors (due to large no. of communal storage and non-official dump site, existing opening dump site)
- Weakness to abide by the rules and regulations
FUTURE PLANS

- To modify existing national policy or to add new rules and regulations for environmental management
- Now, MCDC and ADB (Asian Development Bank, Japan, Korea development agency, UN-Habitat and Netherlands, Philippine, Thailand, Malaysia companies co-operate the project leading to ‘Green City’
- **REDUCE** - based on segregation of waste in community through education of students and contests
- **REUSE** – to help private ownerships to become a proper and systematic ones
- **RECYCLE** - to improve recycle process in both MCDC property and private business
- Including process of Waste to Energy Project in Mandalay co-operated with Organic Asia Group (Thailand) will start in 2015 and composting
Thank you for your attention