MAWLAMYINE 2022-CLEAN AND GREEN

SOLID WASTE MANAGEMENT

Contant

• Existing situation
• Vision and SWOT Analysis
• GAP Analysis
• Objective
• Strategies
• Proposals (Project Cost)
Existing Situation

CITY BACKGROUND AND URBAN PLANNING INFORMATION

- Area: 218.9 km²
- Ward: 29 wards
- Generation rate: 0.55 kg/capita/day
- Household Waste Generated: 143.76 ton/day
- Market Waste: 28.5 ton/day
- Total Waste: 170.8 ton/day
- Served waste: 60.89 ton/day
- Served ward: 23 wards
- Coverage: 35.6%
**Current Solid Waste Management System**

- **Waste Generation**
  - House Hold
  - Market
  - School
  - Hotel
  - Restaurant

- **Collection & Transportation**
  - Bell Ringing
  - House to House
  - Trailer
  - Hand Carts
  - 3 Wheel Motor cycle
  - Road Sweeping

- **Disposal**
  - FDS Mu Yang

**Hospital Waste**

**Hazardous waste/ Commercial waste**

**On Call**

**Related Area Site**

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**COLLECTION EFFICIENCY**

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste Collection Ton/day</th>
<th>Workers/Employee</th>
<th>Collection Vehicles</th>
<th>3 wheel Motorcycle/Trailer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>35.0</td>
<td>90</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>2013</td>
<td>35.46</td>
<td>95</td>
<td>10</td>
<td>2/15</td>
</tr>
<tr>
<td>2014</td>
<td>39.12</td>
<td>95</td>
<td>11</td>
<td>2/15</td>
</tr>
<tr>
<td>2015</td>
<td>41.28</td>
<td>100</td>
<td>11</td>
<td>2/10</td>
</tr>
<tr>
<td>2016</td>
<td>60.89</td>
<td>127</td>
<td>18</td>
<td>2/5</td>
</tr>
</tbody>
</table>
## SOLID WASTE ESTIMATION

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Waste Generation Kg/c/d</th>
<th>Waste Generation (Ton/day)</th>
<th>Market Waste (Ton/day)</th>
<th>Total Waste (Ton/day)</th>
<th>Waste Collected (Ton/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>258860</td>
<td>0.55</td>
<td>142</td>
<td>28.5</td>
<td>170.8</td>
<td>46.9</td>
</tr>
<tr>
<td>2016</td>
<td>264089</td>
<td>0.56</td>
<td>149</td>
<td>29.8</td>
<td>178.7</td>
<td>60.89</td>
</tr>
<tr>
<td>2020</td>
<td>286084</td>
<td>0.62</td>
<td>177</td>
<td>35.5</td>
<td>212.8</td>
<td>191.6</td>
</tr>
<tr>
<td>2025</td>
<td>316172</td>
<td>0.69</td>
<td>218</td>
<td>43.6</td>
<td>261.8</td>
<td>240.8</td>
</tr>
<tr>
<td>2030</td>
<td>349424</td>
<td>0.76</td>
<td>266</td>
<td>53.1</td>
<td>318.7</td>
<td>299.6</td>
</tr>
<tr>
<td>2040</td>
<td>426788</td>
<td>0.9</td>
<td>384</td>
<td>76.8</td>
<td>460.9</td>
<td>451.7</td>
</tr>
</tbody>
</table>

## FINAL DISPOSAL SITE

Damp site area = 81.46 acres
SOLID WASTE MANAGEMENT BUDGET

<table>
<thead>
<tr>
<th>Income (2016-2017)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Income from waste collection (Tax+Fees)</td>
<td>24,962,677 MMK/year</td>
</tr>
<tr>
<td>(2) Commercial Waste Tax</td>
<td>13,700,000 MMK/year</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38,662,677</strong> MMK/year</td>
</tr>
<tr>
<td>(3) Average Daily Income</td>
<td>109,525 MMK/year</td>
</tr>
<tr>
<td>(4) Average Household fees</td>
<td>1198.65 MMK/year</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regular Expenditure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Salary</td>
<td>102,500,000 MMK/year</td>
</tr>
<tr>
<td>(2) Fuel</td>
<td>70,200,000 MMK/year</td>
</tr>
<tr>
<td>(3) Equipment</td>
<td>2,200,000 MMK/year</td>
</tr>
<tr>
<td>(4) Maintenance</td>
<td>9,650,000 MMK/year</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>184,550,000</strong> MMK/year</td>
</tr>
</tbody>
</table>

VISION

• Mawlamyine 2022- Clean and Green
## SWOT Analysis

### Strength
- Financial Strength of the TDC (Surplus budget in 2016-17)
- Small and large scale informal sector collectors of recyclable materials
- Availability of City development plan
- Current levy of tariff on solid waste management (1200mmk/year)
- Assistance of the international funding institutions (i.e. assistance for water supply)

### Weakness
- Absence of organized waste separation and resource recovery practices and current practise only limited to open dump
- Water born diseases is recorded to be a major health problem
- Absence of community awareness of the sustainable solid waste management practices
- Inadequate staff, vehicles and equipment of the cleaning department
- Current practises of the waste management – land fill only

### Opportunities
- Priority placed by international donors on environmental infrastructure
- Demand for recycled materials in the local and international market
- Growing demand for organic food in the global and local market

### Threats
- Location of dump site near the residential house and sports institute

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### Location of Damp Site

![Map of Location of Damp Site](image)
Objectives

- Recovery of the resources up to 70% by 2022 and 100% by 2025
- Separation of the waste at the source up to 75% by 2022 and 100% by 2025
- Cleaning Department to become financially self-sufficient by 2022
- Enhancing the living condition of the informal waste collectors

Gap Analysis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Current Situation</th>
<th>Future Expectation (2022)</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resource recovery level</td>
<td>0</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>2. Waste Separation at the source</td>
<td>0</td>
<td>70%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Strategies

- Restructuring & Strengthening the technical, financial and management capabilities of the cleaning Department of the TDC.
- Implementation of continuous community awareness programmes together with strict law enforcement.
- Restructuring the waste collection system to match and strengthen the value chain of the resource recovery.
- Establishment of **Private -Public -Partnerships** with the local investors for composting biodegradable waste, getting the local university involved in research.
PROJECT COST

• Improving primary collection system in the town and secondary transport system to the landfill and composting site;
• More efficient separation and collecting of recyclables e.g like ferrous, plastic bottles, glass, aluminium cans and paper, both through the informal sector and formal sector;
• Implementation of a small Hospital Waste Incinerator;
• Introducing source separating organics (SSO) system for diverting large amounts of organic waste to the new planned Composting Plants
• Upgrading of the existing dumpsite to a controlled Landfill with bottom liner and leachate collection and treatment.

Above measures are included in the investment plans of the town and proposed for ADB Financing .
Total CAPEX is estimated at 14 million USD for the first phase of project implementation

BENEFITS

• Social
  • Health-related benefits due to clean environment
  • Employment generation for low-income people and increased job standards
  • Upgrading living conditions of the low-income people involved in waste separation/collection
  • Enhancement of community perception - the pride of having a clean city
• Economic
  • Building the city brand names as a Clean City – a key aspect of the city competitiveness attracting investors.
  • Strengthening financial stability of the TDC, so that it can provide other services better.
  • Reduction of the cost of agriculture produce, due to the use of compost fertilizer and increase of the farmers’ income. It will provide a further encouragement to step into the organic food market, further increasing the farmers’ income.
  • Save value urban land – otherwise necessary for landfill
  • Savings from storm water management.
• Environment
  • Control of Groundwater and soil pollution
  • Control of air pollution
  • Elimination of unpleasant visual quality of the city due to improper waste disposal.
  • Elimination of infections from direct contact with contaminated materials, dog and rodent bites, consuming meat from the waste-fed animal