Programmatic CDM Project Using Municipal Organic Waste of 64 Districts of Bangladesh

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Department of Environment, Government of Bangladesh

**Session 3 – Financing decentralized and community-based 3R Initiatives: Policies and public-private partnerships, and economic incentives**

Regional Workshop on Sustainable Development Benefits of Decentralized Municipal Solid Waste Management in Asia-Pacific Region, 30 November – 1 December 2017, Bangkok
- Brief on waste management situation in Bangladesh
- Project description
- Public private partnership approach
- Financial analysis of IRRC operation
- Strength and weakness
Present Solid Waste Management Situation of Bangladesh

- 6493 Tons/day (1991)
- 13330 Tons/day (2005)
- 23,688 Tons/day (2014)
- 47,000 Tons/day (2025)
High organic matter >> (more than 70%)
High moisture content >> (more than 50%)
Low calorific value >> (less than 1000 Kcal/Kg)
The National 3R (Reduce, Reuse, Recycle) Strategy for waste was passed in 2010.

A National 3R Wing at the Ministry of Environment and Forests was established under this strategy to implement waste prevention activities, and an inter-ministerial committee to coordinate activities across ministries.

**National 3R Goal:** The national 3R goal for waste management is to achieve complete elimination of waste disposal on open dumps, rivers, flood plains by 2015 and promote recycling of waste through mandatory segregation of waste at source as well as create a market for recycled products and provide incentives for recycling of waste.

Some of the recommendations of 3R strategy are as follows:
1. Encouraging public private partnerships to improve public services with regard to environmental management system,
2. Collaboration with scientific research bodies to promote recycling and recovery of waste.
3. To develop a mechanism to correspond between services received and payments made by citizens.
4. Supporting informal sector for recycling.
Programmatic CDM using organic Wastes of Urban Centres (Phourashava/ Municipalities) throughout Bangladesh (in 64 Districts):
Government used its Climate Change Trust Fund.
Programmatic CDM Project Through Composting

Plan of Compost Plant:
- Recyclable Storage
- Care Taker Room
- Compost Box
- Biogas Plant
- Workers Toilet
- Maturing Box
- Office and Storage
- Sorting Platform
- Sun Drying Platform
- Leachate Water Collection

Incoming Waste

Care Taker Room

Workers Toilet

Recyclable Storage

Maturing Box

Office and Storage

Sorting Platform

Sun Drying Platform

Leachate Water Collection

Care Taker Room

Workers Toilet

Recyclable Storage

Maturing Box

Office and Storage

Sorting Platform

Sun Drying Platform

Leachate Water Collection

Incoming Waste

Biogas Plant

Workers Toilet

Recyclable Storage

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Incoming Waste

Biogas Plant

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Recyclable Storage

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Sun Drying Platform

Leachate Water Collection
Different Steps of Composting Process

Source Separation
- Collection
- Sorting
- Mixing
- Weighing
- Piling
- Composting
- Maturing
- Screening
- Bagging
- Marketing
Segregation of Waste at Source

2 Bin System (Yellow & Green Bins)

Rickshaw Van (House to house collection)  Transportation Truck
Programmatic CDM Project Through Composting

Integrated Resource Recovery Center
Panchabati, Narayanganj

Implemented By:
Narayanganj City Corporation
Supported By:
Department of Environment
Funded By:
GoB through BCCT
- Promoting public, private, and community partnership
- Government providing incentives on land, construction cost for the compost plant, free utilities (electricity & water), awareness on source segregation of waste, free delivery of waste to the plant.
- Waste Concern providing technical support to establish and run the composting initiative.
The project is the first large scale attempt to improve waste handling by composting on a national scale.

As a pioneering effort by the project proponent and the municipalities to be involved in the CPA, the project will contribute to the sustainable development of Bangladesh. The following environmental, economic and social benefits are achieved by executing the project:

1. **Environmental benefits** – assist in preventing uncontrolled GHG generation and emission from waste that would have been disposed at the landfill; production of soil improver (compost) to battle soil degradation;
2. **Economical benefits** – composting on this scale is a new industrial activity for Bangladesh and the projects will contribute to partial replacement of imported chemical fertilizer by locally produced compost;
3. **Social benefits** – jobs for locals and staff training to improve skills of locals.

The project comprises the design and building of a composting plants at cities all over Bangladesh with a maximum daily input capacity of between 5 and 100+ tones per day.

Apart from compost the projects will reduce methane emissions by diverting high organic waste from dumping at a landfill (where anaerobic process occurs) to a composting plant (aerobic process).
## Operational Description of Compost Plants

<table>
<thead>
<tr>
<th>Description</th>
<th>Narayanganj (22 Tons/d)</th>
<th>Mymensingh (8Tons/d)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Collection</td>
<td>14 MT/day</td>
<td>12 MT/day</td>
<td>26 MT/day</td>
</tr>
<tr>
<td>Organic waste for composting</td>
<td>10 MT/day</td>
<td>8 MT/day</td>
<td>18 MT/day</td>
</tr>
<tr>
<td>Compost (15-18%)</td>
<td>1.7 MT/day</td>
<td>1.36 MT/day</td>
<td>3.06 MT/day</td>
</tr>
<tr>
<td>Employee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>worker</td>
<td>Male: 7</td>
<td>Male: 03</td>
<td>Male: 10</td>
</tr>
<tr>
<td></td>
<td>Female: 10</td>
<td>Female: 13</td>
<td>Female: 23</td>
</tr>
<tr>
<td>Management</td>
<td>Male: 03</td>
<td>Male: 02</td>
<td>Male: 05</td>
</tr>
<tr>
<td></td>
<td>Female: 00</td>
<td>Female: 00</td>
<td>Female: 00</td>
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<tr>
<td></td>
<td>Total: 20</td>
<td>Total: 18</td>
<td>Total: 38</td>
</tr>
</tbody>
</table>
## Cost benefit analysis of Compost Plant (per day)

<table>
<thead>
<tr>
<th>Description</th>
<th>Name of Plant</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td></td>
<td>Narayanganj</td>
<td>Mymensingh</td>
</tr>
<tr>
<td>Waste Collection</td>
<td>Free delivery</td>
<td>Free delivery</td>
</tr>
<tr>
<td>Salary</td>
<td></td>
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<tr>
<td>Worker (US$ 4/P/day)</td>
<td>US$ 68</td>
<td>US$ 64</td>
</tr>
<tr>
<td>Management (US$ 5/P/day)</td>
<td>US$ 15</td>
<td>US$ 10</td>
</tr>
<tr>
<td>Total:</td>
<td>83</td>
<td>74</td>
</tr>
<tr>
<td>Utility (Electricity, water supply, packaging etc.)</td>
<td>US$ 40</td>
<td>US$ 58</td>
</tr>
<tr>
<td>Plant Rent</td>
<td>US$ 4.16</td>
<td>US$ 2.08</td>
</tr>
<tr>
<td>Total Cost</td>
<td>US$ 127.16</td>
<td>US$ 134.08</td>
</tr>
<tr>
<td>Total Income from Compost Sale (US$ 125 per ton)</td>
<td>US$ 212.50</td>
<td>US$ 170.00</td>
</tr>
<tr>
<td>Net income per day</td>
<td>US$ 85.34</td>
<td>US$ 35.92</td>
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<td>Strength of the Project</td>
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<td>------------------------</td>
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<tr>
<td>• National 3R Strategy for Waste</td>
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<tr>
<td>• Increasing demand of compost</td>
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<tr>
<td>• Incentive from the city corporation</td>
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<tr>
<td>• Cooperation from Municipality</td>
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<td>• Cooperation from Central Government</td>
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Weakness of the

- Source separation
- Less number of licensed operators
- Absence of inorganic waste management
Thank You