Prospects of Green Jobs in Waste Recycling

Presented by
Waste Concern

www.wasteconcern.org

Workshop on
GREEN JOBS INITIATIVES IN BANGLADESH
Jointly Organized by
Ministry of Labour and Employment
Government of the People’s Republic of Bangladesh
International Labour Organization

Venue: SURMA Hall, Hotel Sonargaon, Dhaka
Date: 30 July 2008
I. Overview of Waste Sector in Bangladesh
II. Baseline Situation of Waste Recycling
III. Opportunity of Green Jobs from Waste Recycling
IV. National Policies and Rules Linked with Green Jobs
V. Barriers Faced
VI. Way Forward
Urbanization in Bangladesh

### Urban Population Density/Sq.Km.

<table>
<thead>
<tr>
<th>Year</th>
<th>Bangladesh Urban</th>
<th>Dhaka Mega City</th>
<th>Dhaka City Corporation Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>2179</td>
<td>4795</td>
<td>15333</td>
</tr>
<tr>
<td>2004</td>
<td>3008</td>
<td>8573</td>
<td>18055</td>
</tr>
</tbody>
</table>

### Total Urban Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Urban Population</th>
<th>Percent of Urban Population</th>
<th>Average Annual Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>1819773</td>
<td>4.33</td>
<td>1.69</td>
</tr>
<tr>
<td>1961</td>
<td>2640726</td>
<td>5.19</td>
<td>3.75</td>
</tr>
<tr>
<td>1974</td>
<td>6273602</td>
<td>8.78</td>
<td>6.62</td>
</tr>
<tr>
<td>1981</td>
<td>13535963</td>
<td>15.54</td>
<td>10.63</td>
</tr>
<tr>
<td>1991</td>
<td>20872204</td>
<td>20.15</td>
<td>5.43</td>
</tr>
<tr>
<td>2001</td>
<td>28808477</td>
<td>23.39</td>
<td>3.27</td>
</tr>
<tr>
<td>2025*</td>
<td>78440000</td>
<td>40.00</td>
<td>-</td>
</tr>
</tbody>
</table>

*Source: UMP, Asia News, Summer, 1999*
### Total Waste Generation in Urban Areas of Bangladesh in 2005

<table>
<thead>
<tr>
<th>City/Town</th>
<th>*WGR (kg/cap/day)</th>
<th>No. of City/Town</th>
<th>Total Population (2005)</th>
<th>Population (2005)</th>
<th>TWG*** (Ton/day)</th>
<th>Average TWG (Ton/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhaka</td>
<td>0.56</td>
<td>1</td>
<td>6,116,731</td>
<td>6,728,404</td>
<td>3,767.91</td>
<td>5,501.14 4,634.52</td>
</tr>
<tr>
<td>Chittagong</td>
<td>0.48</td>
<td>1</td>
<td>2,383,725</td>
<td>2,622,098</td>
<td>1,258.61</td>
<td>1,837.57 1,548.09</td>
</tr>
<tr>
<td>Rajshahi</td>
<td>0.3</td>
<td>1</td>
<td>425,798</td>
<td>468,378</td>
<td>140.51</td>
<td>205.15 172.83</td>
</tr>
<tr>
<td>Khulna</td>
<td>0.27</td>
<td>1</td>
<td>879,422</td>
<td>967,365</td>
<td>261.19</td>
<td>381.34 321.26</td>
</tr>
<tr>
<td>Barisal</td>
<td>0.25</td>
<td>1</td>
<td>397,281</td>
<td>437,009</td>
<td>109.25</td>
<td>159.51 134.38</td>
</tr>
<tr>
<td>Sylhet</td>
<td>0.3</td>
<td>1</td>
<td>351,724</td>
<td>386,896</td>
<td>116.07</td>
<td>169.46 142.76</td>
</tr>
<tr>
<td>Pourashavas</td>
<td>0.25</td>
<td>298</td>
<td>13,831,187</td>
<td>15,214,306</td>
<td>3,803.58</td>
<td>5,553.22 4,678.40</td>
</tr>
<tr>
<td>Other Urban Centers</td>
<td>0.15</td>
<td>218</td>
<td>8,379,647</td>
<td>9,217,612</td>
<td>1,382.64</td>
<td>2,018.66 1,700.65</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td><strong>522</strong></td>
<td><strong>32,765,516</strong></td>
<td><strong>36,042,067</strong></td>
<td><strong>10,839.75</strong></td>
<td><strong>5,826.04</strong> 13,332.89</td>
</tr>
</tbody>
</table>

*WGR= Waste Generation Rate,  
** Including 10% increase for floating population,  
***TWG= Total Waste Generation, which increases 46% in wet season from dry season  
Source: 1 JICA (2004), 2 Chittagong City Corporation, 3 Field Survey, 4 Sinha (2000), 5 Field Survey, 6 Sylhet City Corporation, 7, 8 Field Survey

Average per capita urban waste generation rate is estimated as **0.41 kg/capita/day**.
## Relationship of GDP & Population with Waste Generation

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban Population</th>
<th>Total Urban Waste Generation (Ton/day)</th>
<th>Per Capita Waste Generation Rate in urban areas Kg/cap/day</th>
<th>Per Capita GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>20.8 million</td>
<td>6493</td>
<td>0.31*</td>
<td>US $ 220</td>
</tr>
<tr>
<td>2005</td>
<td>32.76 million</td>
<td>13,330</td>
<td>0.41**</td>
<td>US $ 482****</td>
</tr>
<tr>
<td>2025</td>
<td>78.44 million</td>
<td>47,000</td>
<td>0.60***</td>
<td>-</td>
</tr>
</tbody>
</table>

High organic matter >> (more than 70%)
High moisture content >> (more than 50%)
Low calorific value >> (less than 1000 Kcal/Kg)
Lack of space for disposal of solid waste
WASTE GENERATION IS RAPIDLY INCREASING
Unsanitary Crude Dumping Practice

Mymensingh Town
Unsanitary Crude Dumping Practice
Negative Impacts of Unmanaged Waste

LEACHATE
Polluting Ground & Surface Water

VERMINS
Spreading more than 40 Diseases

METHANE GAS
Bad Odor & Green House gas
Baseline Situation of *Waste Recycling*

<table>
<thead>
<tr>
<th>City</th>
<th>TWG* (Ton/day)</th>
<th>% of Inorganic Waste Recycling**</th>
<th>Savings through recycling per year, (Tk. million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhaka</td>
<td>4,634.52</td>
<td>15.00</td>
<td>170.00</td>
</tr>
</tbody>
</table>

- **500,000 nos.** (estimated) poor from the informal sector involved in recycling trade in Bangladesh
- **120,000 nos.** poor from informal sector are involved in recycling trade chain of Dhaka city
'Waste is merely raw material in the wrong place', (Talbot, 1920). Eighty eigght years ago, Fedrick A. Talbot in his book, Millions from Waste wrote this line.
Municipal Waste

- Domestic
- Commercial
- Industrial
- Street Sweeping
- Hospital & Clinical Waste

Opportunity of Green Jobs from Waste Recycling

- Organic Waste Recycling
- Landfill Gas Extraction
- Plastic Waste Recycling
- Lead Acid Battery Recycling
ENVIRONMENTAL AND HEALTH PROBLEMS IN URBAN AREAS DUE TO UNMANAGED WASTE

ORGANIC MATTER DEPLETION IN THE SOIL OF RURAL AREAS

SOLUTION

Composting Organic Waste
700 Tons/day Capacity Clean Development Mechanism (CDM) Based Composting Project in Dhaka (being implemented by Waste Concern)

**Input**
- **Collection**
  (Organic Waste From Markets)
- **Saving**
  DCC cost

**Process**
- **Aerobic Composting**
- **Saving**
  Landfill Area

**Output**
- **Compost**
  (50,000 tons/year)
- **Carbon Credits**
  (89,000 ton Co2e)
- Producing environment friendly product

**Pro-poor element**
- **700 tons/ day**
  of waste collection
  Starting from 100 tons/day
- **Job Creation**
  400 new jobs
- **Creating 800 new jobs**
- **Focusing on Waste Pickers**
- **Health Insurance**
- **Daycare Center**
- **Free Meal**
- **Cheaper**
- **Less Irrigation**
- **Soil Quality Improved**
- **Higher Yield**
- **Leads to higher income**
Prospects of Harnessing Kyoto Protocol and CDM to Create Green Job

Industrialized country → Investment $$ → Emission reduction credits (cer/ver) → Project Reducing GHG emissions in developing country

GHG emission potential from Urban Organic Waste of Bangladesh:
2.19 million ton CO2e / year
Before-After: *Waste Collection System*

**Present Collection Practice**

**Improved Covered Collection**
Aerobic Composting System
Temperature Monitoring

Quality Control

Aeration Control

Regular Oxygen Monitoring
Giving Better Working Environment
Organic Cotton Production in Bogra
Organic Crops
Replication in **Rural Areas of Bangladesh**
Organic Waste COMPOST PLANT Joint Venture of WC, WWR, FMO & Triodos Bank of NL

DCC
CDM Board
BOI

Project Investment Harnessing CDM
Project Approval
Giving concession agreement for 15 years

CER (carbon credits)
Compost

International Market
Rural Farmers
Urban Population

Attracted 12 million Euro

• Direct Collection from Vegetable markets
• Paying CBOs/NGOs for waste delivery
• Promoting source separation and community participation

PUBLIC
PRIVATE
COMMUNITY

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Opportunity of Green Jobs from Composting

Urban Municipal Waste
14,000 tons/day

Composting

Green Jobs
14,000 nos.

Jobs for compost plant: 9,800 nos.
Jobs for collection of waste: 4,200 nos.
Mitigation-Adaptation Loop
CDM Based Landfill Gas Extraction Utilization at Matuail Landfill Site in Dhaka, Bangladesh (approved by GoB and UNFCCC)

- This project will recover methane gas which is a major Green House Gas (GHG) from waste dumping site at Matuail and also to generate **3 MW (minimum)** and **6 MW (maximum) of electricity**, using the recovered methane gas.

- CDM project will create at least **250 new jobs** for the urban poor.

- Enhance the life of the Matuail landfill site upto 2020, with no financial cost to DCC.

- Promote technology transfer and capacity building of DCC in solid waste management.

- Promoting Public-Private Partnership in solid waste management.
Plastic Waste Recycling
**Existing Scenario in Dhaka**

Plastic Waste Disposed  
130 tons/day  
47,450 tons/year

70% Recycled and used in the country (Except PET)  
33,215 tons/year

- **BENEFITS:**
  - Generating 21,000 jobs
  - Saving DCC expenditure of Tk. 3.08 crore by avoiding plastic waste
  - Saving Foreign currency of US $ 51 million/ year by avoiding import of virgin plastic.

**Proposed Intervention**

Plastic Waste Disposed  
130 tons/day  
47,450 tons/year

95% Recycled efficiency

- **BENEFITS:**
  - Create Additional Jobs
  - Saving DCC Expenditure 4.2 Crore/year
  - Saving foreign currency of US $ 69.35/year
  - Less Plastic waste disposed in land and reduced environmental pollution.
  - Better working environment and income for people involved in recycling trade.
  - Surplus pellets may be exported like PET if local market demand is met.
**Recovered Lead:** 6000 ton/Year  
**Savings:** 4.73 million US$/year  
(avoiding lead import using foreign currency (60% recycling rate at present)  
**Jobs Created:** 6000 new jobs
National Policies and Rules Linked with Green Jobs

POLICY

- **National Policy for Water Supply and Sanitation, 1998**
  According to this policy the government shall take measures for recycling of waste as much as possible and use organic waste materials for compost and bio-gas production;

- **Draft National Urban Policy- 2006**
  CDM and Recycling has been emphasized in this policy

RULES

- **Lead Acid Battery Recycling and Management Rules, 2006**: Under this rules collection and recycling has been improved. This rules is based on a detail study carried out by Waste Concern on 2005 under SEMP.

- **Draft National Solid Waste Management Handling Rules, 2005**: 3R principal has been used. This rule has been prepared by Waste Concern under SEMP.

STRATEGY

- **Poverty Reduction Strategy Paper (PRSP) 2005**: Here EMS has been promoted. To improve the solid waste management situation, special focus is given to segregation of waste at source along with the promotion of recycle, reduce and reuse of industrial and other solid waste etc.

- **National Sanitation Strategy 2005**: Its goal is to achieve 100% sanitation coverage by 2010. Here emphasis on resource recovery and recycling has been given as top priority to improve urban sanitation situation instead of disposal.

ACTION PLAN

- **Dhaka Environment Management Plant 2005**
  Waste recycling has been promoted, less land filling encouraged, EMS promoted among industries.

- **National Environmental Management Action Plan (NEMAP) (1995)**:
  This is a plan of the Government of Bangladesh (GoB), prepared by the Ministry of Environment and Forest (MoEF) in consultation with people from all walks of life. Waste Concern is promoting 3R, under the Sustainable Environment Management Programme (SEMP) of NEMAP.

- **Solid Waste Management Action Plan for Eight Secondary Towns in Bangladesh (2005)**: Under the Secondary Towns Integrated Flood Protection (Phase-2) Project of Local Government Engineering Department, 31. This strategy is based on based on 4 R principle i.e. reduce, reuse, recycle and recover of the waste.

DECLARATION

- **Dhaka Declaration 2004 on Waste Management by SAARC countries during 10–12 October 2004.** SAARC countries agree to encourage NGOs and private companies to establish community based composting, segregation of waste at source, separate collection and resource recovery from wastes with particular focus on composting.
At present there is no clear policy or tax incentive package offered by the government to encourage private sectors to go for Green Jobs.

Regulatory barriers should be removed. For example, we needed 44 (forty four) permissions/clearance required for this project before implementation and 2 (two) are required after the production of compost.

Lack of awareness, knowledge and capacity about Green Jobs.

Lack of Public Private & Community Partnership.

Lack of Easy financial support by Banks/financing/grants.

R & D should be promoted by government and external support agencies considering the local socio-economic and climatic condition.
Way Forward

- Carbon Financing is the driving force to promote Green Jobs;

- We need to simply lengthy process/barrier required for implementation of projects creating green jobs (example CDM based projects);

- Many projects such as composting, biogas, improved stove, forestry can be implemented having pro-poor elements. We need to identify these kind of projects through baseline inventory which has both the adaptation and mitigation benefits; and

- There are many investors keen to invest in projects which has both mitigation and adaptation benefits