Public-Private Partnership and Decentralized Composting Approach in Dhaka, Bangladesh

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Theme 3:  
Public Private Partnership (PPP) towards Zero Waste Cities

web: www.wasteconcern.org
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Present Situation of SWM in Dhaka, Bangladesh

BANGLADESH SCENARIO

Waste Generation (urban areas) : 15,000 tons/day
Waste Collection Efficiency (urban areas) : 50% (Average)

- High organic matter => (more than 70%)
- High moisture content => (more than 50%)
- Low calorific value => (less than 1000 Kcal/Kg)
Present Situation in Bangladesh

Source of Waste

- Mixed Waste
  - Waste Bins Demountable Containers
  - Transfer Stations

Landfill
At present Dhaka city has only 2 official landfill sites.

Lack of suitable vacant land for disposal of waste

Dhaka is a land hungry city with 22,000 people living per square kilometer

City Authority can collect 50-60% of the waste
WASTE GENERATION IS RAPIDLY INCREASING
Unsanitary Crude Dumping Practice
PROBLEMS FROM PRESENT PRACTICE

Solid Waste Management is based on end-of-pipe solution which is only focused on collection, transportation and final disposal...

VERMINS
Spreading more than 40 Diseases

METHANE GAS
Bad Odor & Green House gas

LEACHATE
Polluting Ground & Surface Water

Open dumping practiced in most of the cities and towns, which is the cheapest and easiest solution for them...
The weak performance in source segregation and collection of waste are the primary constraints to the waste sector.

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<td>Inefficient Source Segregation, Collection of Waste</td>
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<td>Municipalities’ poor financial standing to invest in organic recycling related projects;</td>
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<td>Low municipal capacity to operate, maintain such facilities</td>
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<td>Low municipal capacity to engage &amp; monitor private sector partners to run such facilities</td>
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<td>Scarcity of government land to provide for organic waste management</td>
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<td>High cost of Solid Waste Management (SWM). DCC spends more than US$30 /ton</td>
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<td>Low community awareness</td>
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Initially Challenge Faced by Waste Concern

- Lack of conducive policy for composting
- Lack of appropriate technology to handle large scale compost plant
- Lack of finance to establish a large composting initiative
- Lack of land to establish a composting facility
- Lack of public private partnership opportunity
- Lack of Standard & quality control of compost
- Unsure about marketing of compost in large scale
- Unequal playing field with subsidized chemical fertilizer
Choice of Treatment Method Suitable for Dhaka

Treatment Methods for Municipal Organic Waste

<table>
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<th>Source</th>
<th>Process</th>
<th>Product</th>
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| Organic Waste | • Households  
  • Shops & Markets  
  • Restaurants  
  • Institutions  
  • Others | Aerobic Treatment, Composting | Animal Feed  
  Compost |
|         | Anaerobic Digestion                          | Biogas  
  Electricity |
|         | Landfill Gas Extraction                      | Electricity |
|         | Refuse Derived Fuel (RDF)                    | Briquetting |
Source of Waste

- Source Separated Waste
  - Promoting 3Rs

  - House-to-House Collection
  - House-to-House Collection
  - Vegetable Markets

  Transfer Stations

  Decentralized Compost Plant
  (Small/medium/large)

  Only 7-10% going to landfill site

Landfill
Clean Development Mechanism (CDM) can act as a critical gap financing measure to supplement early deficits and get projects off the ground until more steady revenue streams arrive, particularly given that the payback period for these projects is estimated to be around 7 years. As of August 31, the price of CERs is now 6 US$/ton. CERs can benefit projects in the following ways:

- recover up to 50% of the project’s capital cost, depending on the type of project; and
- utilize earning potential for CERs, which is for a minimum duration of 10 years and maximum of 21 years.
Project based carbon trading between industrialized and developing countries

Industrialized

Emission reduction credits (CER)

Project Reducing GHG emissions in Dhaka

Dutch Company WWR and Banks, FMO and High Tide

investment $$

web: www.wasteconcern.org
There is a clear linkage between municipal waste management and climate change in developing nations of the Asia-Pacific.

Organic wastes in traditional landfills normally degrade under partly anaerobic conditions and generate methane emissions.

Methane is a more potent GHG than carbon dioxide (CO2) and is a major contributor to climate change.

Composting from organic wastes are examined as one of the possible ways of minimizing this GHG.

Compost from organic waste is consistent with the “reduce, reuse, recycle” (3R) approach being adopted as part of sustainable development strategies and is further evidence of how the climate change and sustainable development can be integrated.
Obtained UNFCCC approval on Sept 2005

This is the globally first registered composting based CDM project

First large scale project to obtain CERs issuance from UNFCCC

www.wasteconcern.org
Decentralized Approach of Composting Using PPP and Carbon Financing: Experience of Dhaka, Bangladesh
Large Scale Decentralized Compost Plant Located in Bulta, Dhaka

Collection Route of Vegetable Waste from Kawran Bazar to Compost Plant
The project is recycling organic vegetable waste and instead of disposing in landfill, it is converted into compost.
LEGEND

1. Weigh Bridge
2. Reception, Sorting & Pre-treatment Area
3. Pre-Composting Area
4. Maturing Area
5. Screening Area
6. Compost Storage
7. Leachate Water Storage Pond
8. Structural Material Storage
9. Building 01: Administration & conference
10. Building 02: Cafeteria, Day care & washing facilities
11. Harvested Rain Water Reservoir
Different Steps of Composting Process

1. Collection
   - Weighing of Waste
2. Sorting
3. Piling
4. Composting
5. Maturing and Compost
6. Screening
7. Bagging
8. Composting
9. Marketing

Collection
Parameters Monitored During Implementation

Collection

Screening

Sorting

Piling

Composting

Maturing and Compost

Screening

Bagging

Composting

Marketing

Weighing of Waste Input
Parameters Monitored During Implementation

Unloading of Incoming Waste and Preliminary Sorting
Parameters Monitored During Implementation

Collection

Sorting

Piling

Composting

Maturing and Compost

Screening

Bagging

Composting

Marketing

About 80% of the dark leachate water input is transformed into clear distilled water within few seconds.

Dark color leachate stored in the tank as input

Moisture Control

Reuse of leachate water
Parameters Monitored **During Implementation**

**Temperature Control**
Process Quality Control

Regular Oxygen Monitoring
Forced Aeration and Leachate Collection System

Forced Aeration by Blowers to Provide Oxygen in the Compost Pile
Different Steps of Composting Process

1. Collection
2. Weighing of Waste
3. Sorting
4. Piling
5. Composting
6. Maturing and Compost
7. Screening
8. Bagging
9. Marketing

Screening of Compost
Compost Produced from Organic Waste

- Collection
- Weighing of Waste
- Sorting
- Piling
- Composting
- Maturing and Compost
- Screening
- Bagging
- Marketing
IMPACT OF COMPOST ON SOIL

83% of cultivable land in Bangladesh has less than 3.5% organic matter (more than 3.5% is considered to be good soil)

FIELD TRIAL EXPERIENCE
Reduces the use of chemical fertilizer 25-30 increased yield 30%

Pie Diagram Showing Depletion of Organic Matter From the Soil of Bangladesh

Quality Control

Complies with GoB Compost Standards of 2008
Different Economic Outputs from IRRC

1 ton Organic Waste

Composting

Produce 1/5 ton (0.20 tons of Compost)

1 ton Organic Waste

Composting

Reduce 1/2 ton Green House Gas
Packaging and Branding of Compost
Informal Sector Given Better Working Environment

- 6% of the operational expenditure spent for welfare of the workers in the plant
- Day care center for female workers
- Free meal for the workers
- Health insurance for the workers

Improved Working Condition

Informal sector working in unsafe working condition
Financial Aspect

- **130 tons/day capacity compost plant**

- **Investment** = 2.5 million euro (land, construction, machinery and upfront investment for PDD preparation and validation and registration)

- **Compost production capacity** = 9000-10,000 tons/year

- **Carbon Credits**: 12,000 tons of CO2e/yr (average)

- **Selling Price of Compost** = 9000 taka/ton to 10,500 taka/ton or 90-105 euro per/ton

Compost Plant Located in Bulta, Narayanganj
Organic Waste

COMPOST PLANT Joint Venture WCC-WWR,FMO, Hightide

CER (carbon credits)

Compost

International Market

Rural Farmers

Urban Population

• Direct Collection from Vegetable markets
• Waste Collected from Households
• Paying CBOs/NGOs/Municipality for waste delivery
• Promoting source separation and community participation
• Engagement of informal Sector

UNFCCC

CDM Board

Project Investment Harnessing CDM

BOI

Project Approval

DCC

Signed concession agreement for 15 years

Till 2012 attracted 25 Million Euro Foreign Direct Investment as carbon finance

PUBLIC

PRIVATE

COMMUNITY

BOI-Board of Investment; DCC-Dhaka City Corporation
Co-ordination Issue between Ministries

Central Government and its Role in SWM

the Local Government Division (LGD) under the Ministry of Local Government Rural Development and Cooperatives (MoLGRD&C) at the national level is responsible for overall planning, identification of investment projects, monitoring and observance of rules governing urban local bodies
recent activities in bangladesh linked to composting and recycling

- Draft National Solid Waste Management Handling Rule (being finalized)
- National 3Rs Strategy 2010
- Implementation of 3Rs (Reduce, Reuse and Recycling) Pilot Initiative in Dhaka and Chittagong Cities to Reduce Green House Gas Emission (Phase 1)
- Programmatic CDM using organic Wastes of Urban Centres (Phourashava/Municipalities) throughout Bangladesh (in 64 Districts): Pilot Phase Fund: Government used its Climate Change Fund
- UNICEF initiated the replication of Waste Concern’s Composting Model and Promoting 3Rs in 19 towns of Bangladesh based on the Action Plan

- The recycling of waste is also highlighted in the recently issued PPP guidelines issued by the Prime Minister’s office as a priority area of PPP.

- The Government of Bangladesh approved the National 3R Strategy in 2010, which made source segregation mandatory and gave directives to municipalities to pursue organic waste-recycling projects through composting, refuse-derived fuel, and biogas via PPP. It makes clear that medium- to large-scale organic waste-recycling projects will be implemented and managed by the private sector. Moreover, the strategy makes recommendations concerning issues such as tipping fees and access to municipal land for recycling projects. Despite the approval of these two regulations, they have yet to be implemented.
• Started replication of Waste Concern composting model in Asia Pacific Countries in partnership with UNESCAP
• Established an international training centre in Dhaka supported by Government of Bangladesh and UNESCAP
• With the support from ESCAP and Bill and Melinda Gates Foundation (BMGF) Established Waste to Resource Fund (W2RF) to provide financial, technical support on waste projects linked with carbon trading in LDCs
Key Issues to Scale up Organic Waste Management

- Political Commitment
- Source Separation of Waste
- Quality and Processing Standards
- Community Awareness
- Technological Issues
- Environmental Issues
- Financing Issues
- Management Issues
- Public Private Partnership (PPP)
- Clean Development Mechanism
- Intergovernmental coordination
- Marketing
- Capacity Building
Measures to Promote Private Sector Investment in Composting

- Clear-cut policy package, incentives, guidelines favorable for private investment needs to be promoted.
- Updated national baseline information/inventory on waste is needed.
- Easy financial support should be promoted by bank/financial organizations and incentives should be extended.
- Tax holidays to provide incentives for private investment, including exemption from value-added tax on products such as compost.
- Exemption from customs duty on the import of capital machinery.

In Bangladesh, the current fiscal incentives include:
(i) tax holidays for up to 5-10 years for all waste treatment and recycling plants
(ii) less import (custom) or excise duties on relevant equipment, and
(iii) No VAT/sales tax on sales of compost.

- Payment of tipping fees to private operator for collecting organic wastes;
- Concessionary rates for utilities such as electricity, diesel, and water;
- Subsidy on compost, similar to that for chemical fertilizers;
- Promotion of compost by the government;
- Provision of land on long-term lease from the government;
- Capacity building training programs for both public and private sector
- Informal sector should to be given special attention
- Lengthy CDM Project approval process needs to be simplified.
Thank You