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

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

WASTE CONCERN

web: www.wasteconcern.org

Presentation Outline

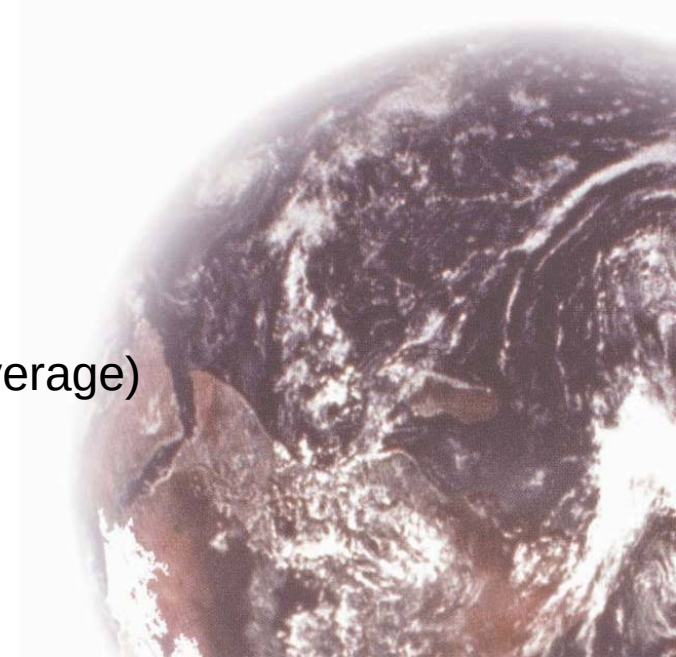
1. Present Situation of Waste Management in Bangladesh
2. Approach of Waste Concern
3. PPP Experience in Dhaka City
4. Key Issues to Scale up Composting Initiatives
5. Way Forward to Promote Private Sector Investment in Composting

Present Situation of SWM in Dhaka, Bangladesh

BANGLADESH SCENEARIO

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

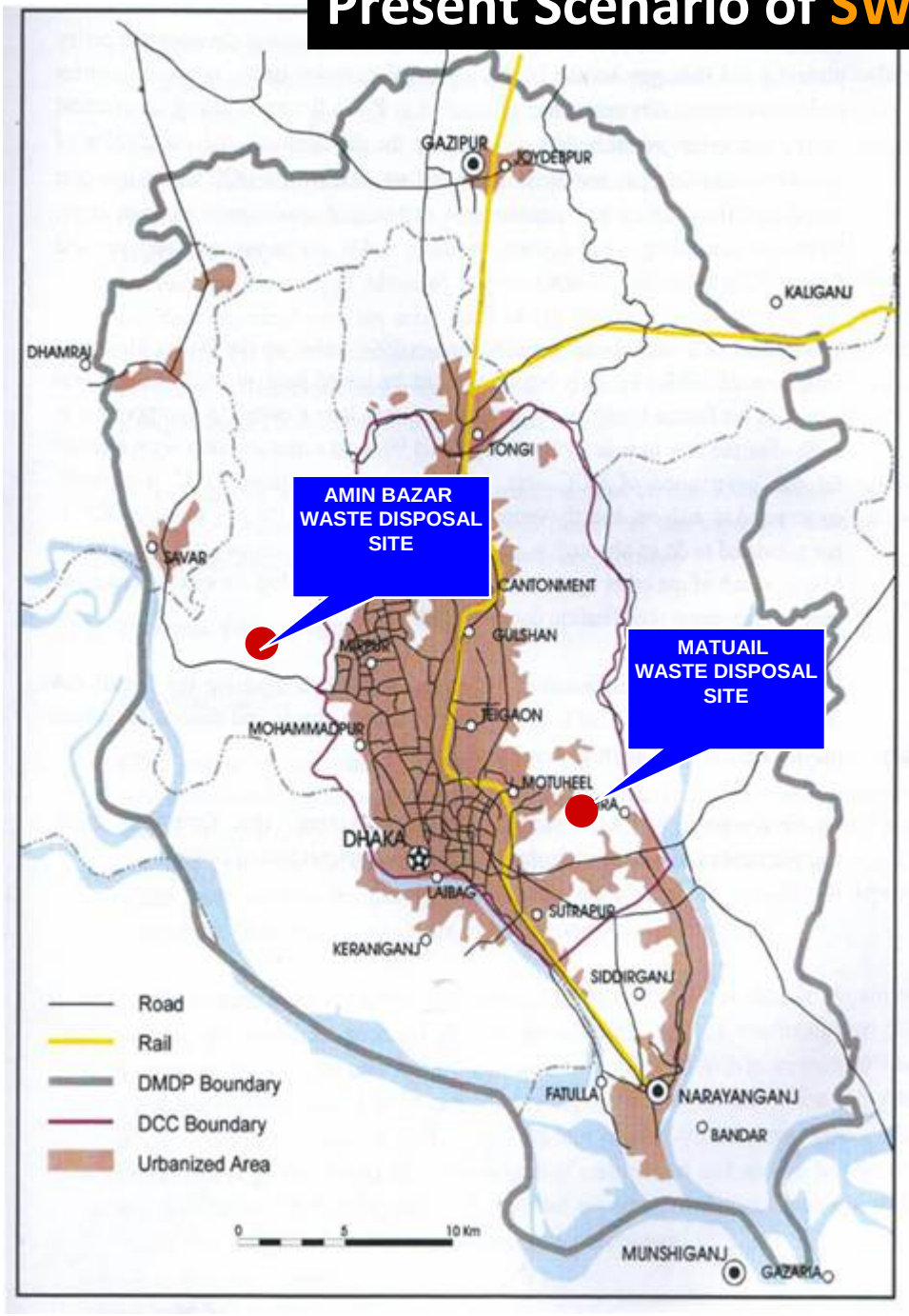
Mixed Waste

Waste Bins Demountable Containers

Transfer Stations

Landfill

Present Scenario of SWM of Dhaka



Demographic Profile of Dhaka Mega City the capital of Bangladesh

In terms of population Dhaka was the 11th biggest city in the year 2000 and will be the 4th largest city in world in 2015

- **Total Population Mega city: 12.3 million**
- **DCC Population : 7 million (2009)**
- **DCC area 27% of the megacity**

- ❑ 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...

Primary Constraint for Organic Waste Composting in Bangladesh

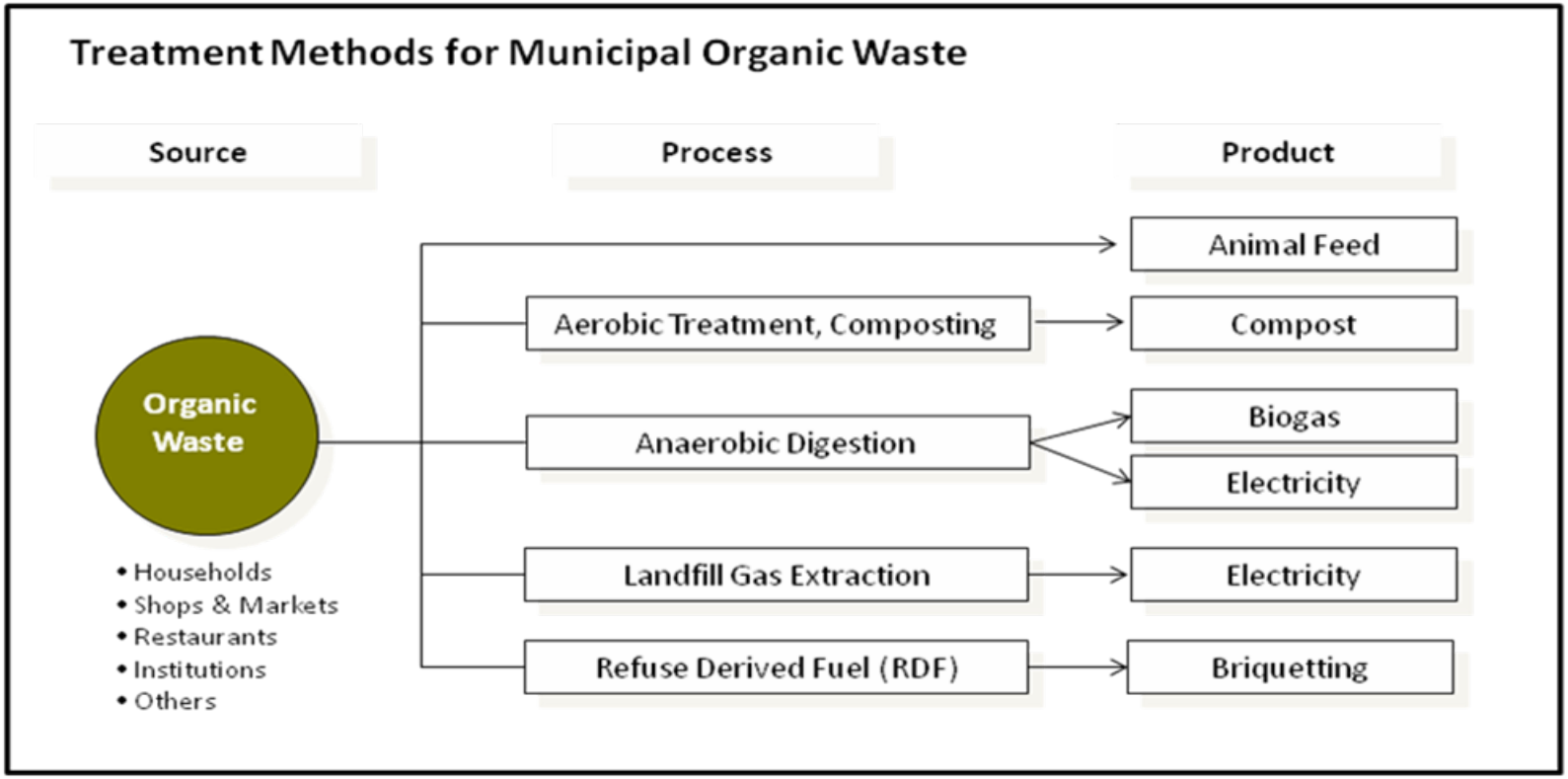
The weak performance in source segregation and collection of waste are the primary constraints to the waste sector.

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

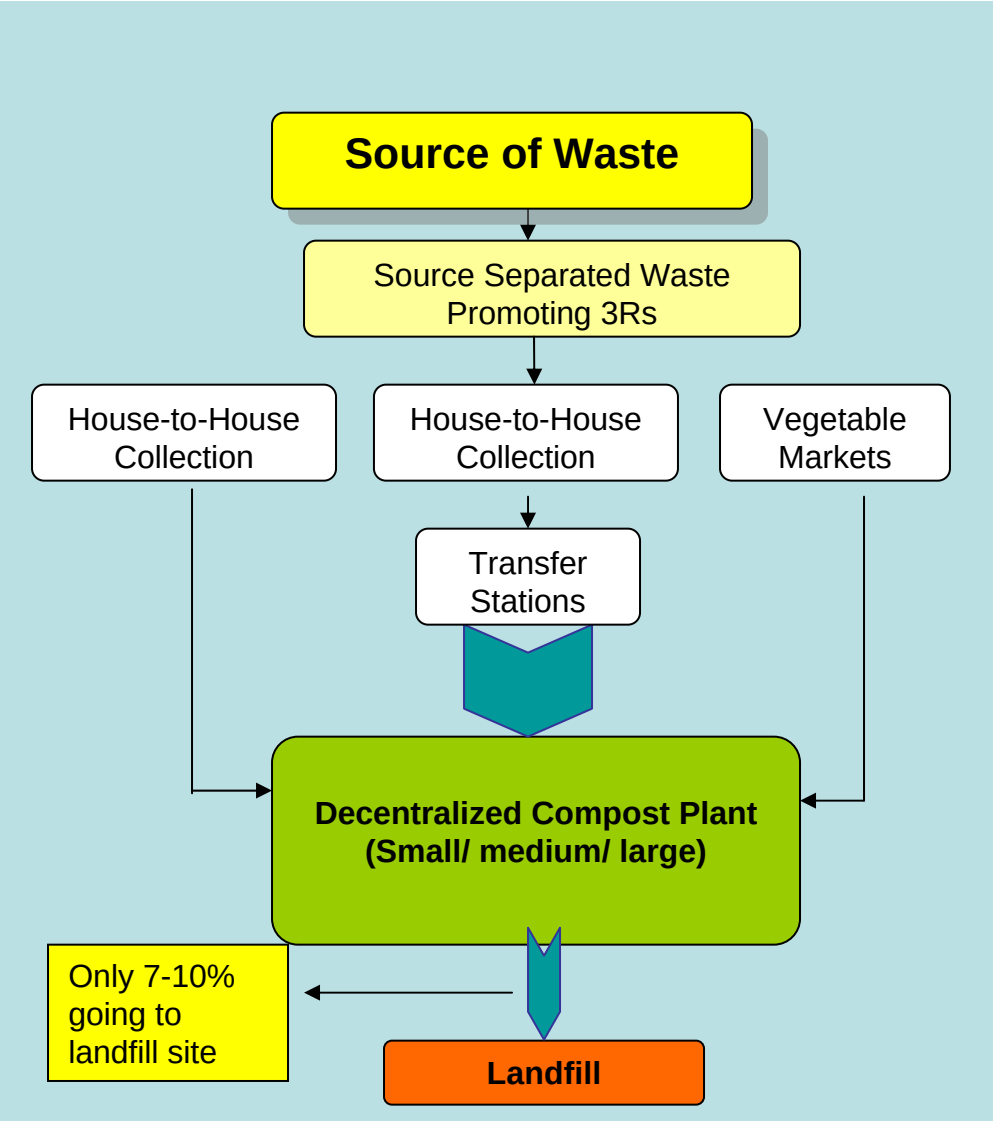
Initially Challenge Faced by Waste Concern

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

Choice of Treatment Method Suitable for Dhaka



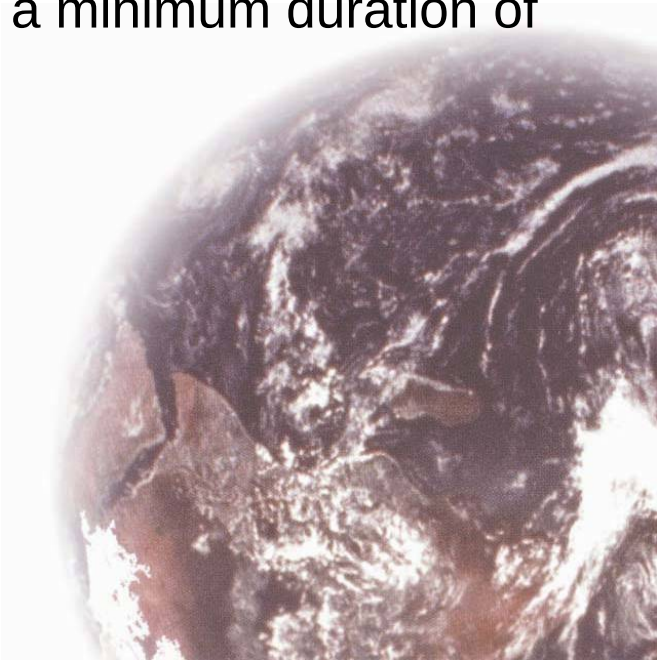
Approach of Waste Concern



Tapping Carbon Financing Opportunity

- 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 upto 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

Dutch Company WWR and Banks, FMO and High Tide

investment $$

Industrialized

Project Reducing GHG emissions in Dhaka

Emission reduction credits (CER)

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Linkage Between Municipal Waste and Climate Change

- There is a clear linkages 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 way 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.

NOTE: The following project activities are required to make the PDD publicly available as per the guidance in paragraph 29 of the report of twenty seventh meeting of the Board:
1. those that use mechanical process to produce refuse-derived fuel (RDF) from waste and its use for energy generation.

Revision to the approved baseline methodology AM0025

"Avoided emissions from organic waste through alternative waste treatment processes"

Source

This baseline methodology is based on the proposed methodologies submitted for the project "Organic waste composting at the Matuail landfill site Dhaka, Bangladesh," whose baseline study, monitoring and verification plan and project design document were prepared by prepared by World Wide Recycling B.V. and Waste Concern. It has been revised to include elements from the methodology for the "PT Navigat

Obtained UNFCCC approval on Sept 2005

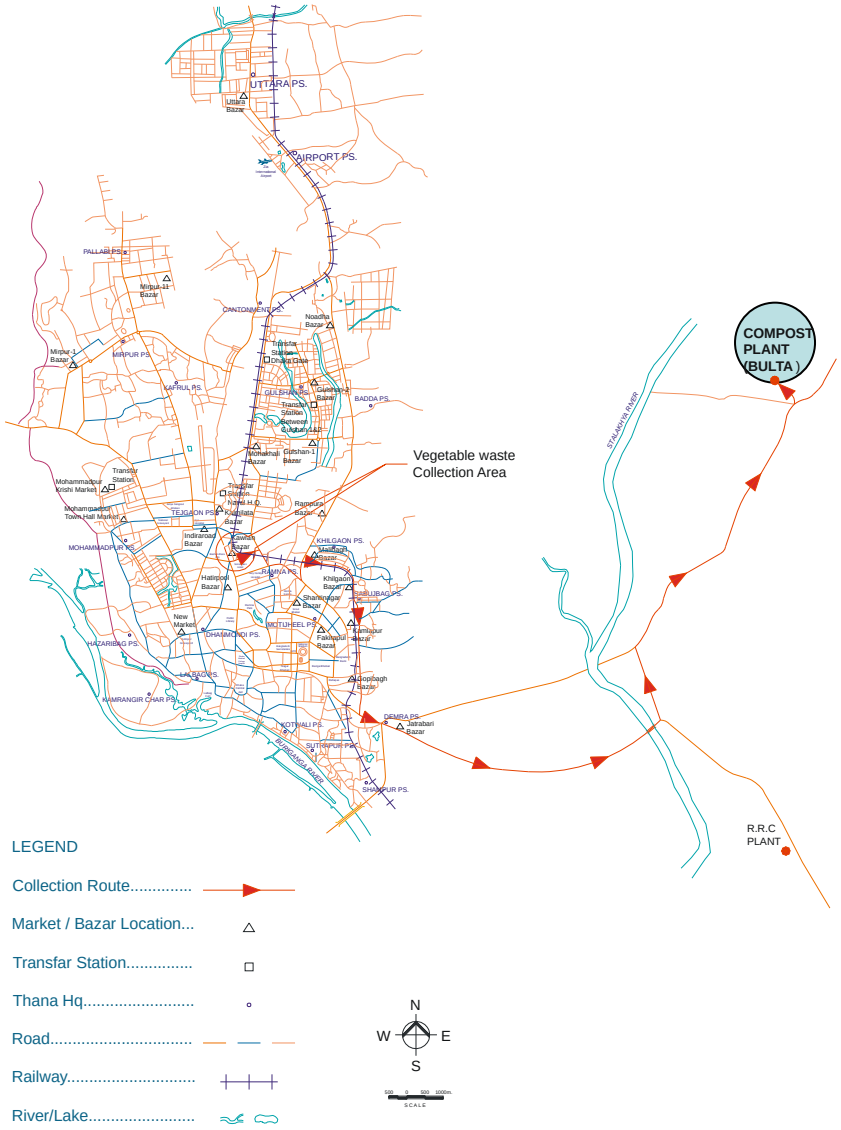
This the globally first registered composting based CDM project

First large scale project to obtain CERs issuance from UNFCCC

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



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Experience CDM Project in Dhaka

Baseline Situation

Methane Emission

Waste → City Authorities Collecting →

Existing Practice: land filling of waste

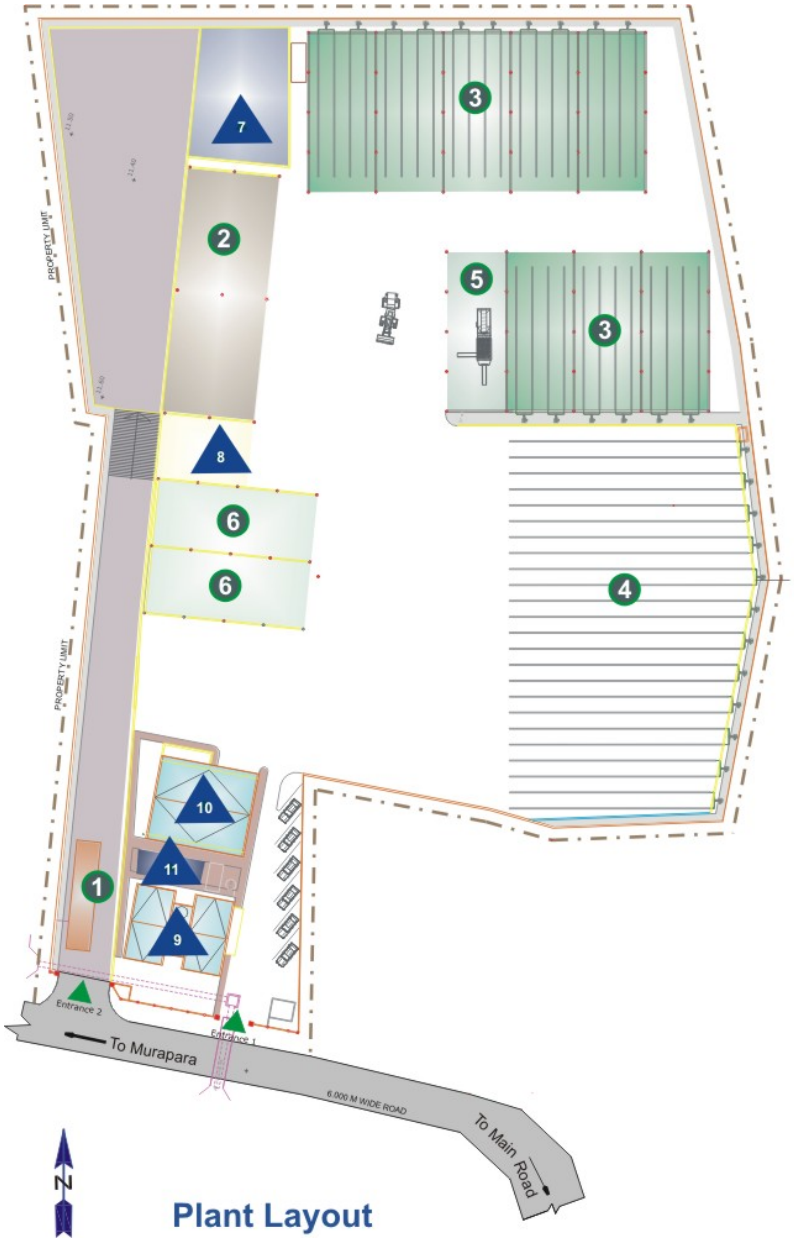
CDM project

No Methane Emission

Registered Composting Project with UNFCCC

The project is recycling organic vegetable waste and instead of disposing in landfill, it is converted Into compost.

Plant layout

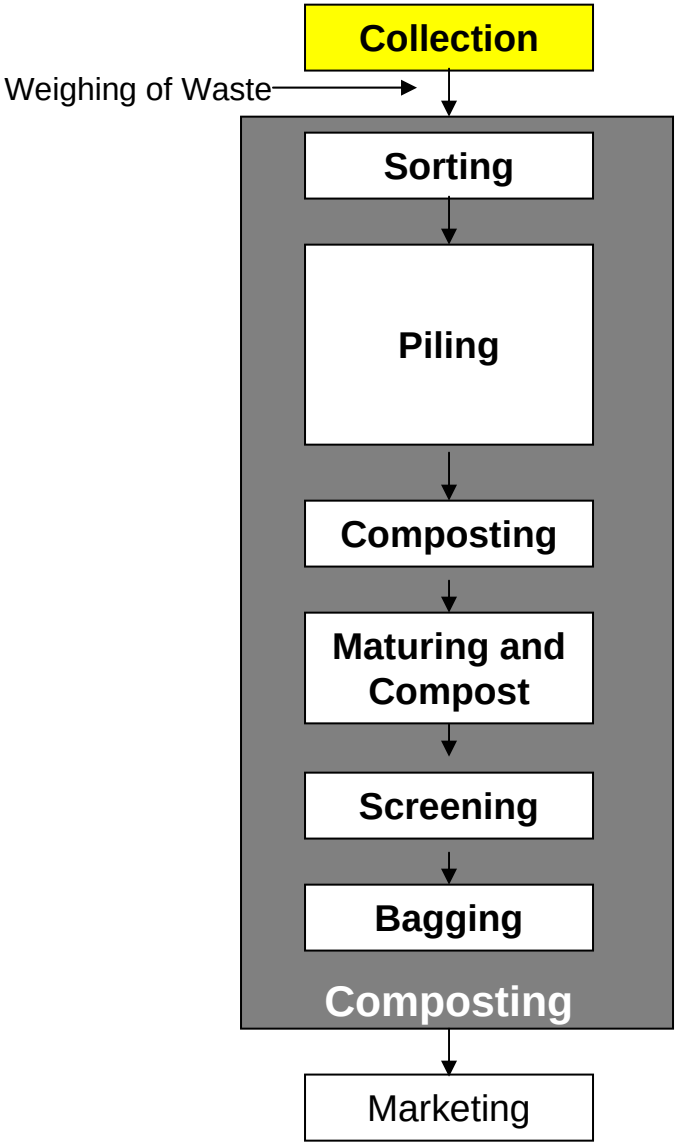


LEGEND

1. Weigh Bridge
2. Reception, Sorting & Pre-treatment Area
3. Pre-Composting Area
4. Maturing Area
5. Screening Area
6. Compost Storage

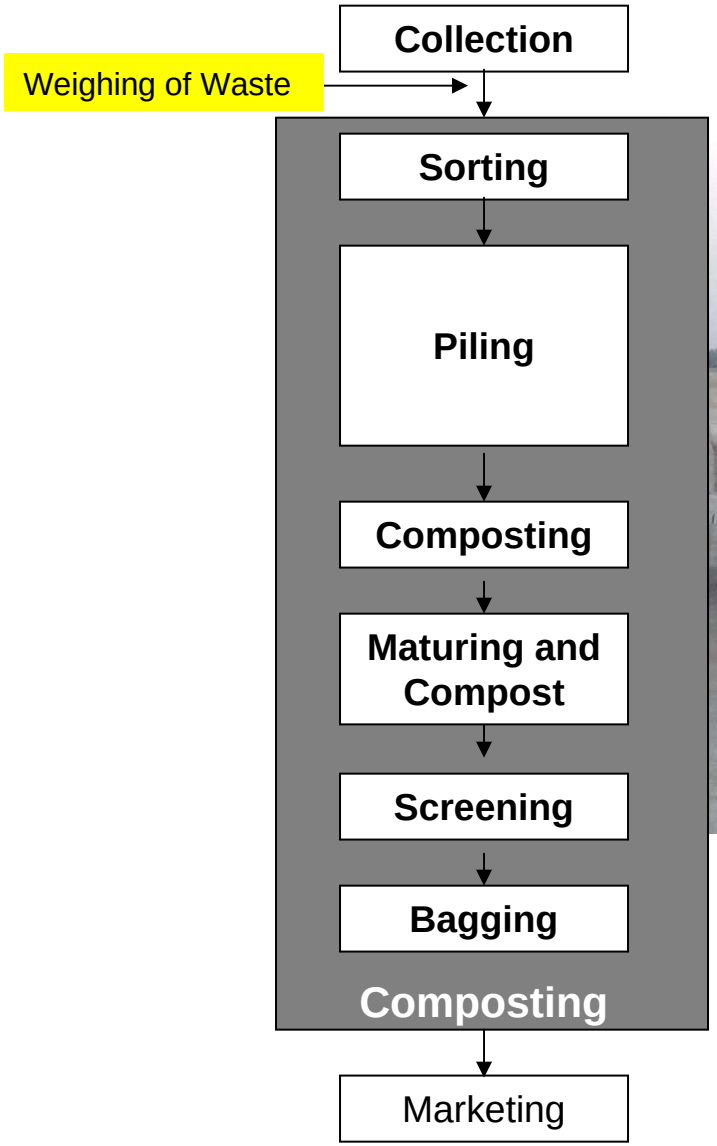
7. Leachate Water Storage Pond
8. Structural Material Storage
9. Building 01: Administration & conference
10. Building 02: Cafeteria, Day care & washing facilities
11. Harvested Rain Water Reservoir

Different Steps of Composting Process



Collection

Parameters Monitored During Implementation

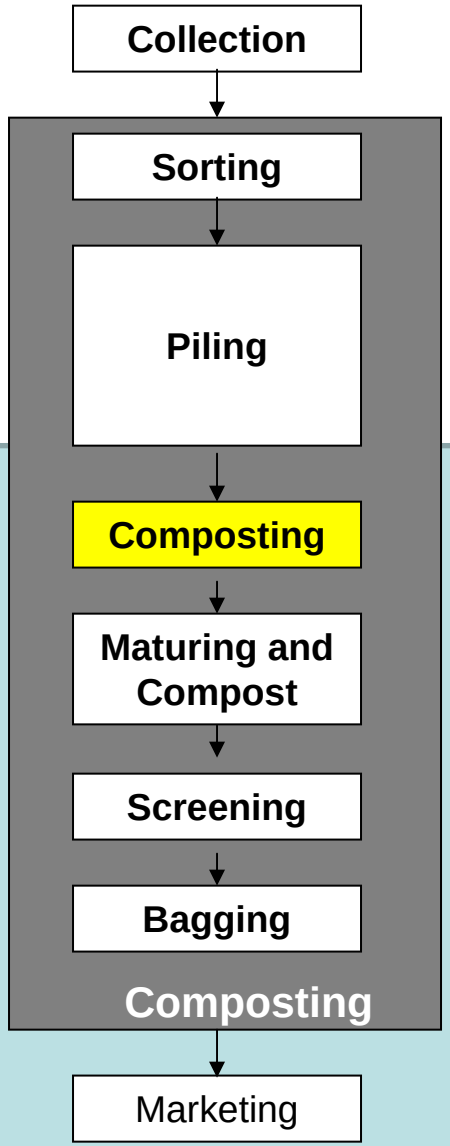


Weighing of Waste Input

Parameters Monitored During Implementation

Unloading of Incoming Waste and Preliminary Sorting

Parameters Monitored During Implementation



Dark color leachate stored in the tank as input

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

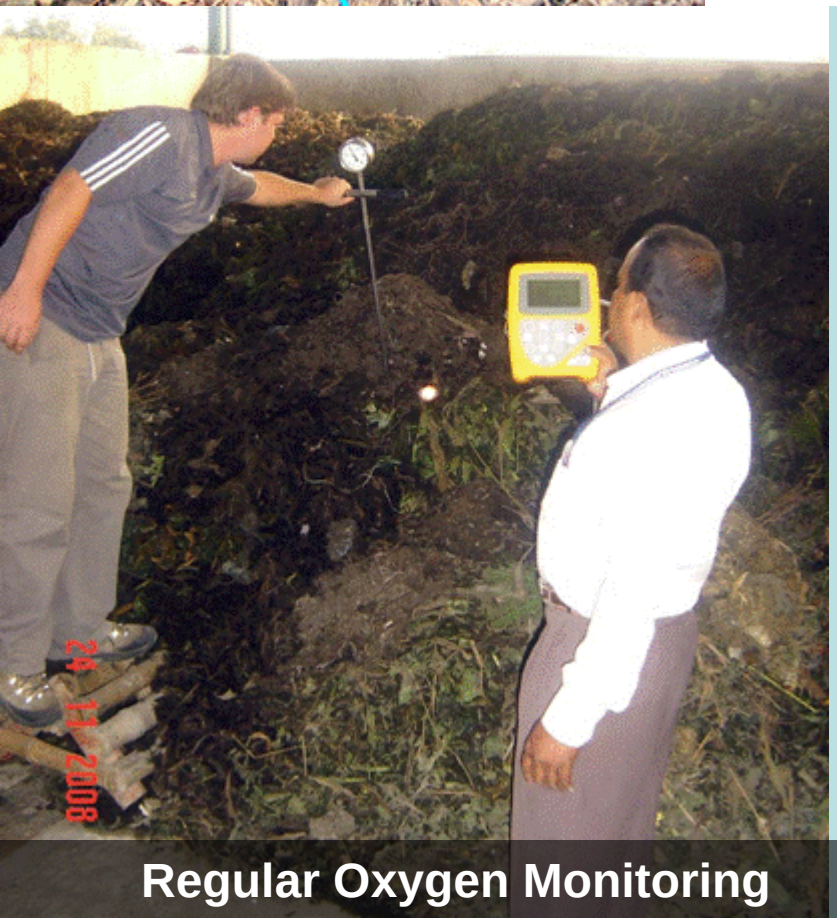
Moisture Control

Reuse of leachate water

Parameters Monitored During Implementation

Temperature Control

Process Quality Control

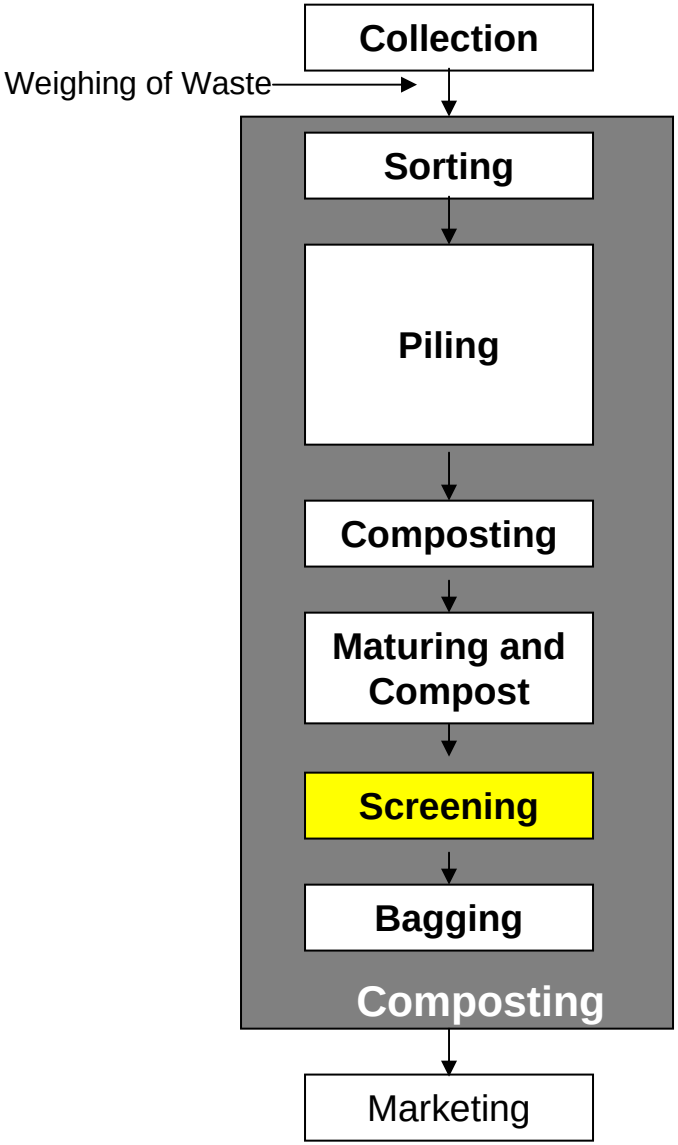


Regular Oxygen Monitoring

Process Quality Control

Forced Aeration by Blowers to Provide Oxygen in the Compost Pile

Different Steps of Composting Process



Screening of Compost

Compost Produced from Organic Waste

Collection

Weighing of Waste

Sorting

Piling

Composting

Maturing and Compost

Screening

Bagging

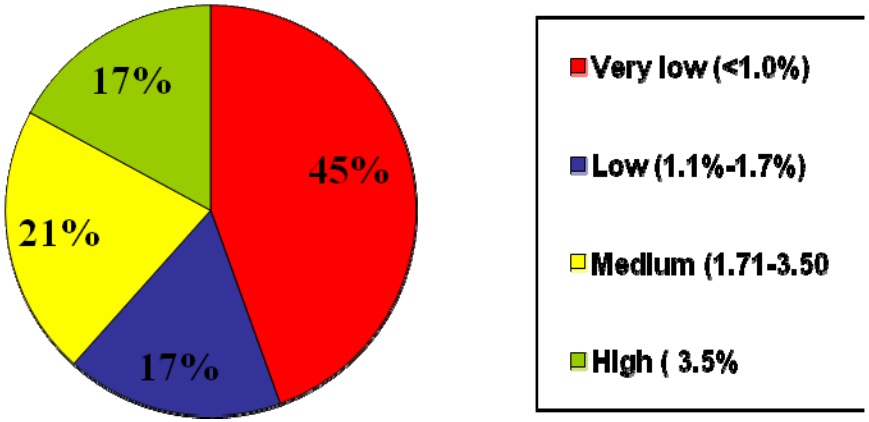
Composting

Marketing

IMPACT OF COMPOST ON SOIL

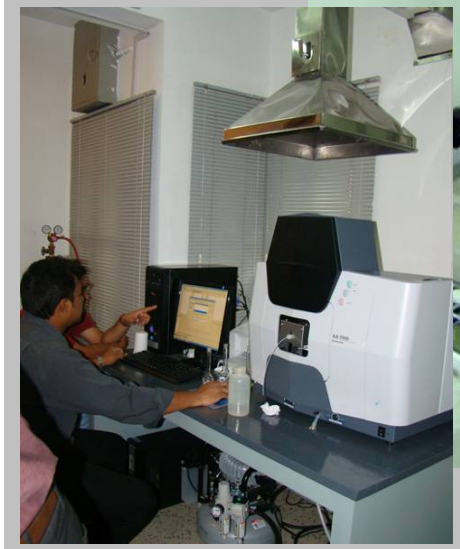
83% of cultivable land in Bangladesh has **less than 3.5% organic matter** (more than 3.5% is considered to be good soil)

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

Produce1/5 ton (0.20 tons of Compost

1 ton

Organic Waste

Composting

Reduce 1/2 ton Green House Gas

Packaging and Branding of Compost

Improved Working Condition

Informal sector working in unsafe working condition

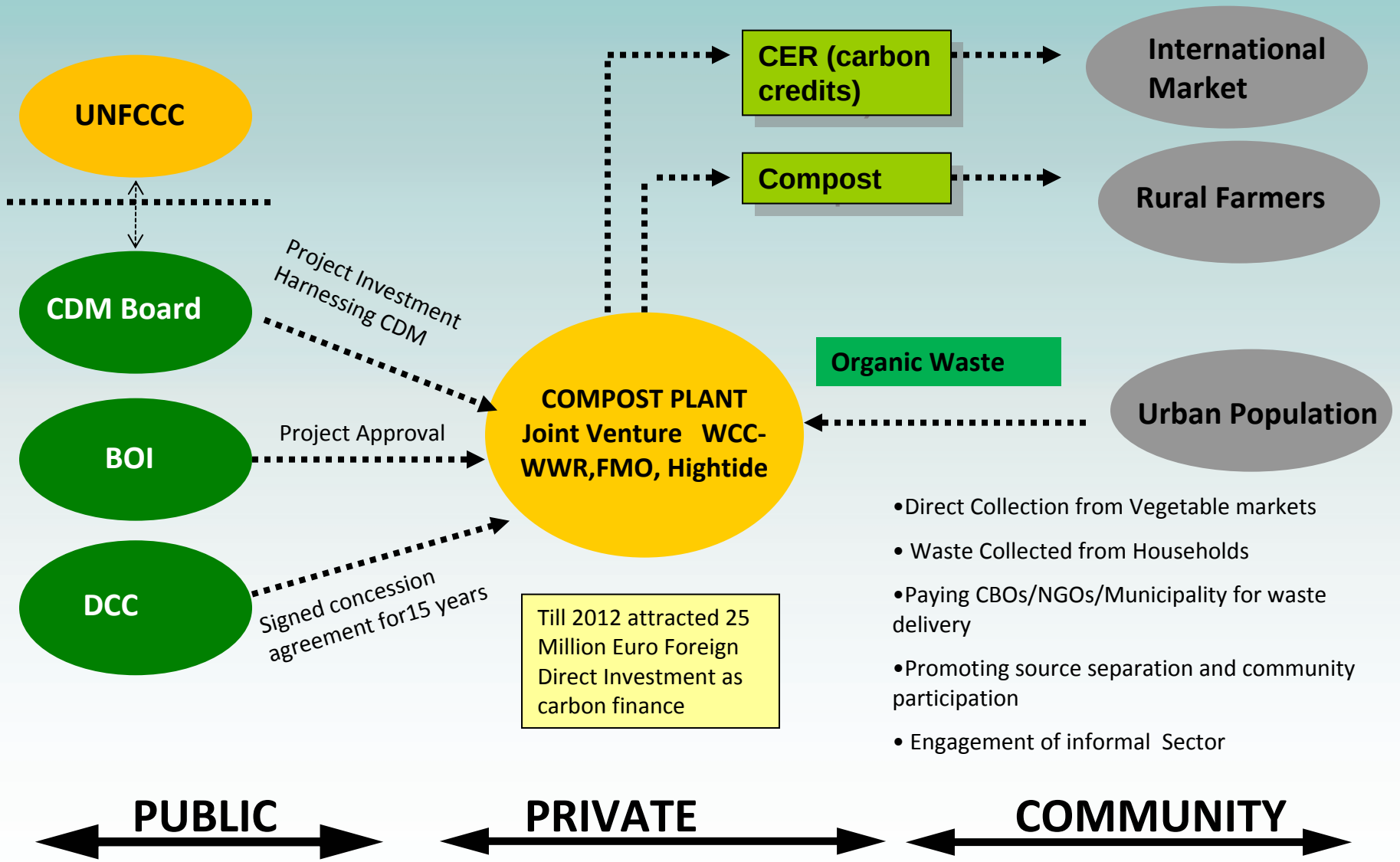
- *6% of the operational expenditure spent for welfare of the workers in the plant*
- *Day care center for female workers*
- *Free meal for the workers*
- *Health insurance for the workers*

Informal Sector Given Better working Environment

Financial Aspect

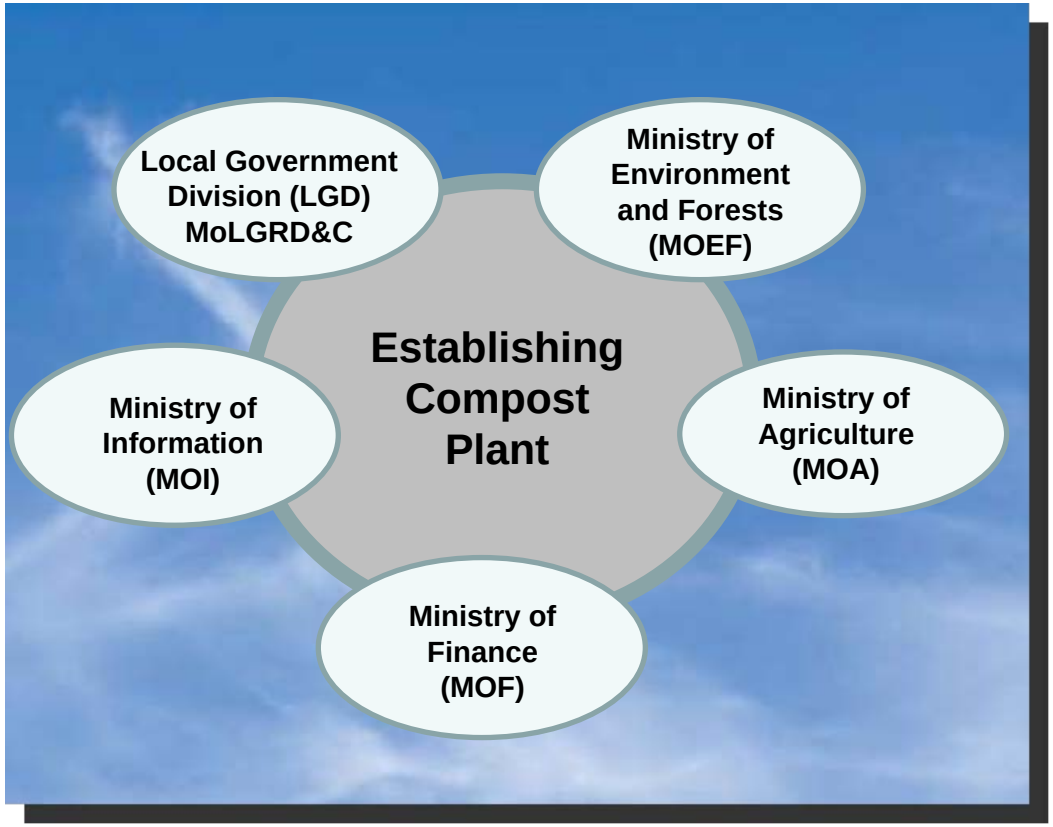
- **130 tons/day capacity compost plant**
- **Investment=** 2.5 million euro (land, construction, machinery and upfront investment for PDD preparation and validation and registration)
- **Compost production capacity =** 9000-10,000 tons/year
- Carbon Credits: 12,000 tons of CO2e/yr (average)
- **Selling Price of Compost** = 9000 taka/per to 10,500 take/ ton or 90-105 euro per/ton

PPP Model



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

Local Government Division (LGD) MoLGRD&C
All the Pourashavas and City Corporations work under (MoLGRD&C). All the rules and regulations, acts, ordinances and government orders regarding the issues of Pourashavas and City Corporations are prepared and then disseminated by LGD.

Ministry of Environment and Forests (MOEF)
In general, MOEF is a nodal ministry responsible for preparing and enforcing a country's environmental rules and regulations

Ministry of Agriculture (MOA
The MOA is the nodal ministry for developing and enforcing compost standards for soil application and registration and certification of compost

Ministry of Finance (MOF)
This ministry is a key player in deciding the levels of financial support and subsidy from the central government to be provided to develop waste recycling projects.

Ministry of Information (MOI)
Plays an important role in promoting source segregation of waste via awareness campaigns in national media. The MOI can raise awareness of the positive impacts of compost application to crops. It can also instruct print media to provide factual information regarding source segregation, as well as encouraging the use of organic waste products as part of corporate social responsibility.

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.

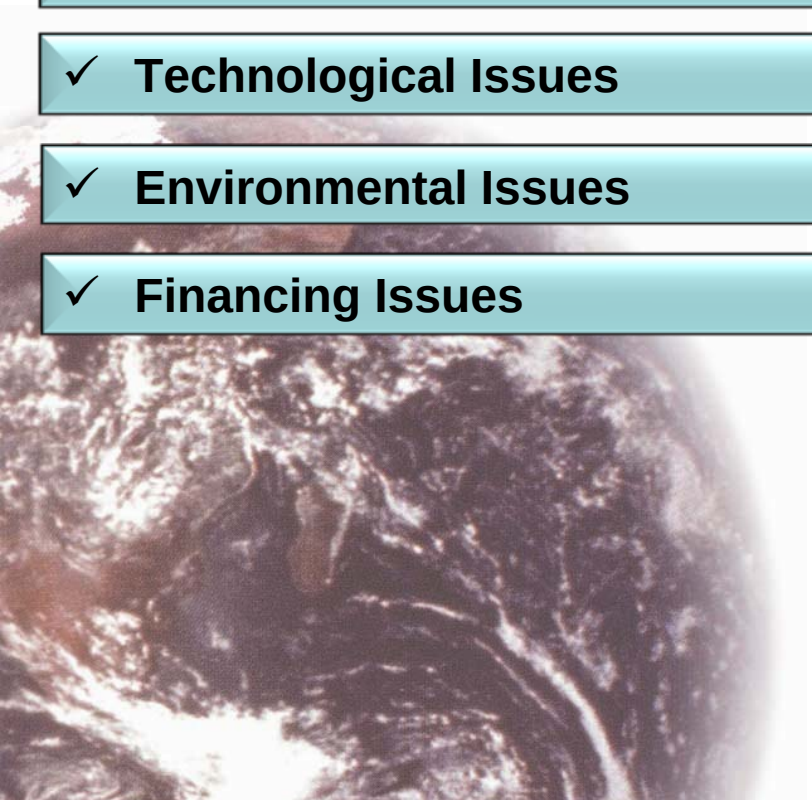
- The Government of Bangladesh approved the National 3R Strategy in 2010, which made source segregation mandatory and gave directives to municipalities to pursue organic waste-recycling projects through composting, refuse-derived fuel, and biogas via PPP. It makes clear that medium- to large-scale organic 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.

Regional Replication

- 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