



Waste Sector CDM Project Development: **Experience of Waste Concern**

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www.wasteconcern.org



Presentation Outline

- I. **Concepts**
- II. **Baselines**
- III. **Project Development**
- IV. **The Challenges Faced During Implementation**
- V. **Barriers and Constraints**
- VI. **Wayforward**

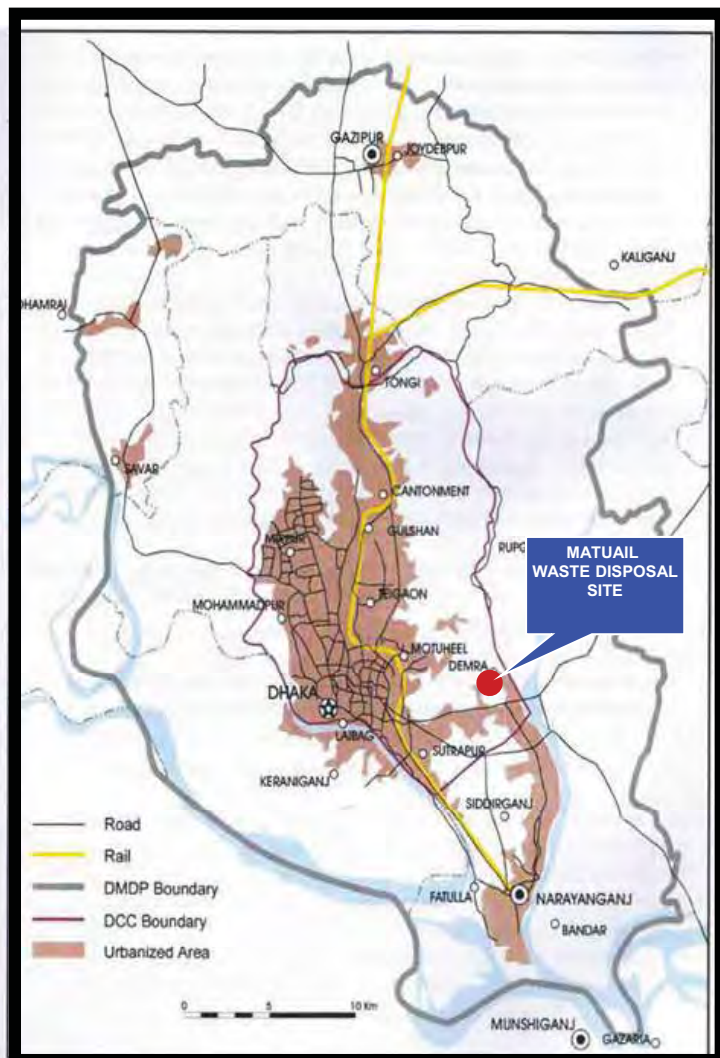
SOLID WASTE GENERATION SCENARIO OF DHAKA CITY

- Per Capita Waste Generation : 0.56 Kg/cap/day
- Total Waste Generation DCC Area : 3800 tonnes/day
- 70% - 80% of the solid waste is organic



URBAN WASTE GENERATION (Tons/ day) IN BANGLADESH

- 1991 : 6493 tonnes/day
- 2005 : 13,300 tonnes/day
- 2025 : 47,064 tonnes/day (estimated)



Demographic Profile of Dhaka Mega City

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 (2002)
- DCC Population : 6.8 million (2006)

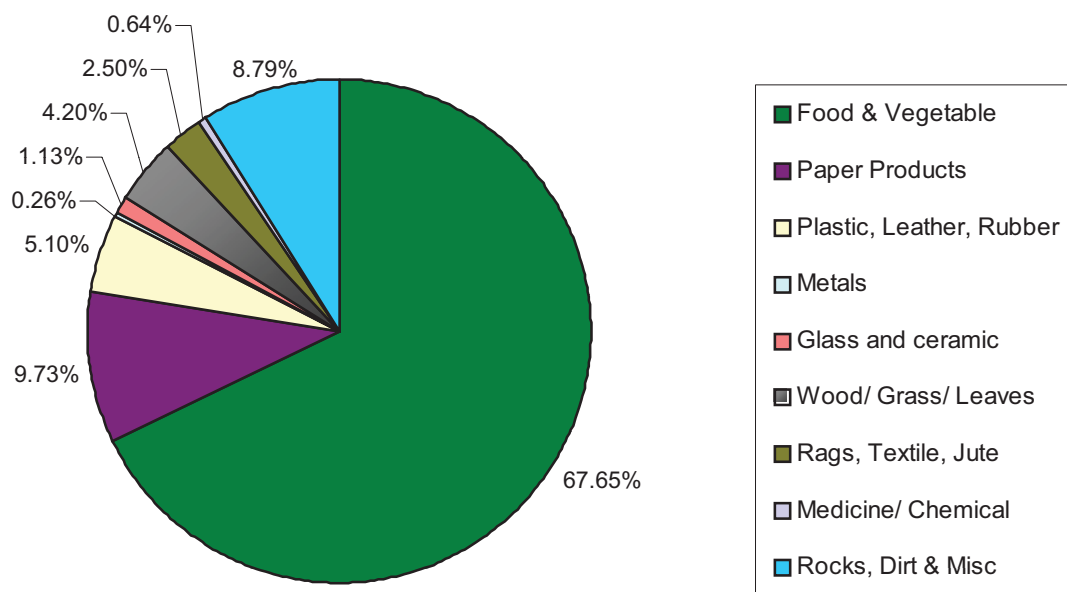
- At present Dhaka city has only 1 official landfill site.
- Lack of suitable vacant land for disposal of waste
- Dhaka is a land hungry city with 18,000 people living per square kilometer

MAJOR PORTION OF WASTE IS ORGANIC



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Fig 1: Average Physical Composition of Urban Solid Waste



Organic Waste Not Utilized in the Dump Sites



Unsanitary Crude Dumping Practice in different cities

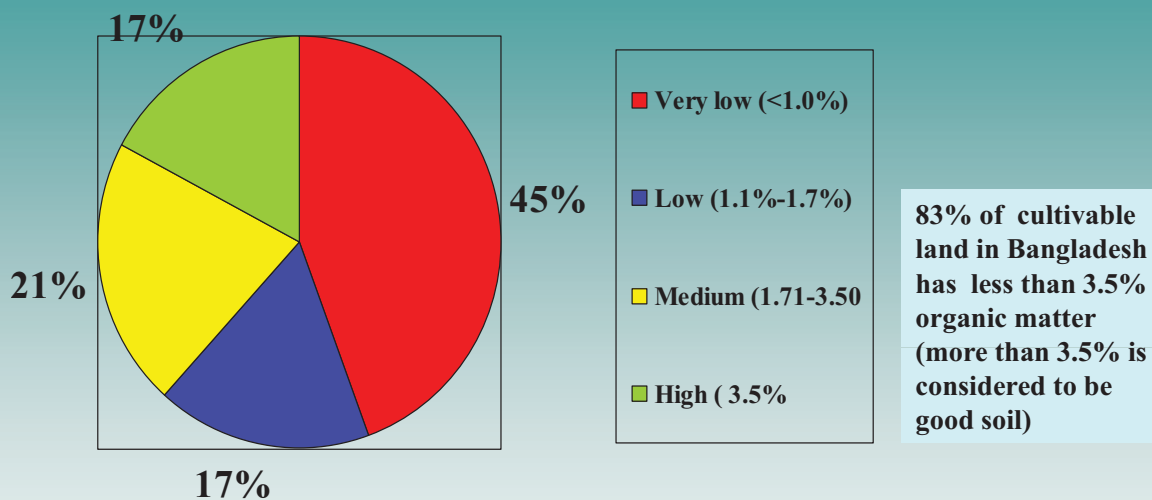


Negative Impacts of Unmanaged Waste



PROBLEMS OF SOLID WASTE MANAGEMENT IN URBAN AREAS

SOIL CONDITION OF BANGLADESH



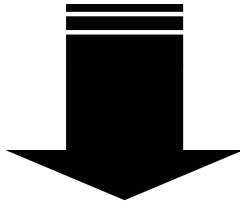
Pie Diagram Showing Depletion of Organic Matter From the Soil of Bangladesh



ADDRESSING TWO MAJOR PROBLEMS

ENVIRONMENTAL AND HEALTH PROBLEMS IN URBAN AREAS DUE TO UNMANAGED WASTE
40% of Waste Remains Uncollected

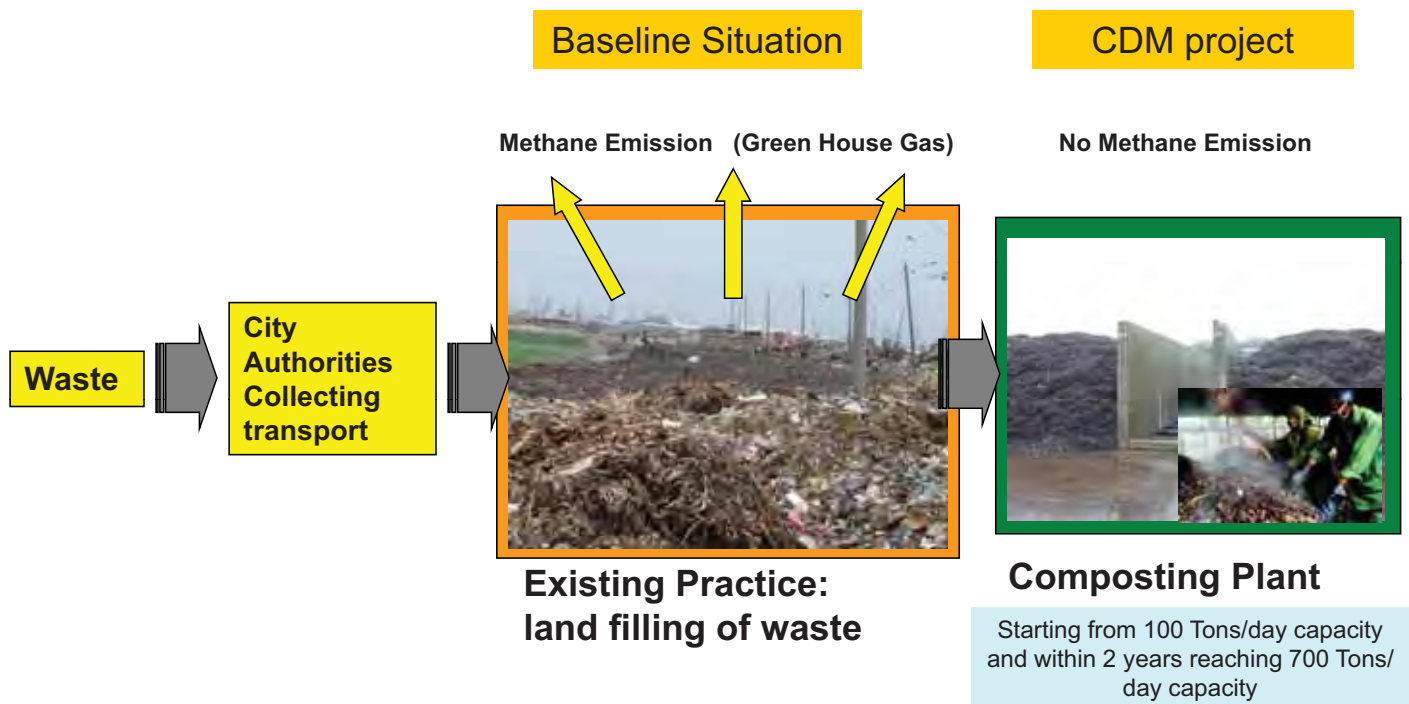
ORGANIC MATTER DEPLETION IN THE SOIL OF RURAL AREAS
83% of the soil has less than 3.5% organic matter



WASTE CONCERN'S-WWR SOLUTION

- Converting Organic Waste Into Compost Using Decentralized Network of Compost Plants
- Use of Compost/Enriched Compost in Agriculture
- Use of carbon credit using CDM

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

Waste Concern is involved in the design, implementation and now monitoring of the project



Project based carbon trading (CER/VER) between industrialized and developing countries

Dutch Company WWR and Banks, FMO and Triodos

CDM investment \$\$

Industrialized country



Emission reduction credits (CER)



Project Reducing GHG emissions in Dhaka

web: www.wasteconcern.org



WHAT IS CDM?

Clean Development Mechanism (CDM) is an important component of the **Kyoto Protocol (Article 12)**

Clean Development Mechanism known as CDM allows 39 industrialized countries to achieve part of their green house gas emission target through investment in projects in developing countries that reduce GHG emission from the atmosphere.



Methane Gas Emission is being measured by the expert of the Royal Haskoning of the Netherlands and Waste Concern by land fill gas analyzer at the Matuail Waste Disposal site of Dhaka City Corporation



CDM – Executive Board

UNFCCC/CCNUCC



AM0025 / Version 0
Sectoral Scope 1
EB 2

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”

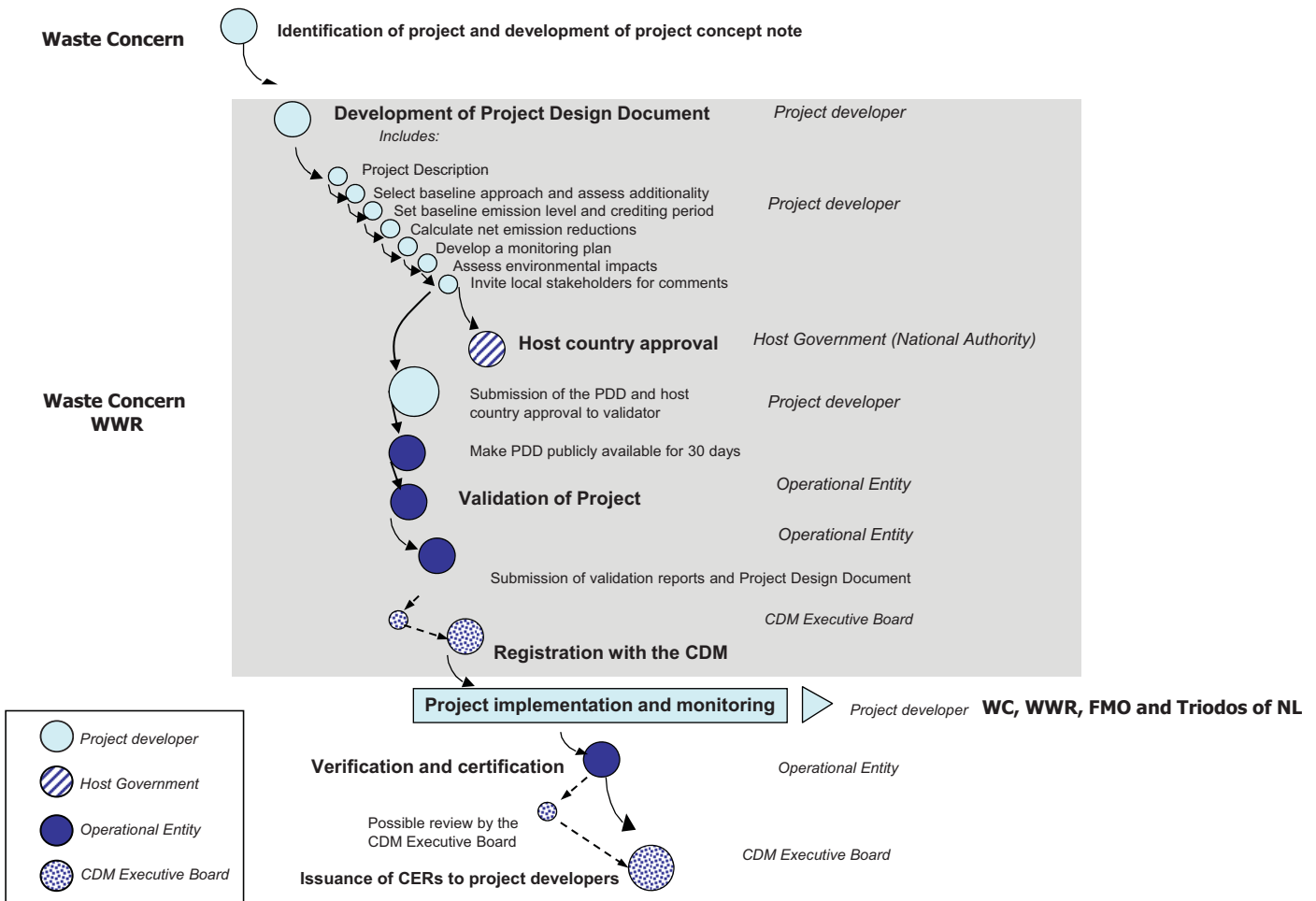
Source

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 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

CDM Project Cycle



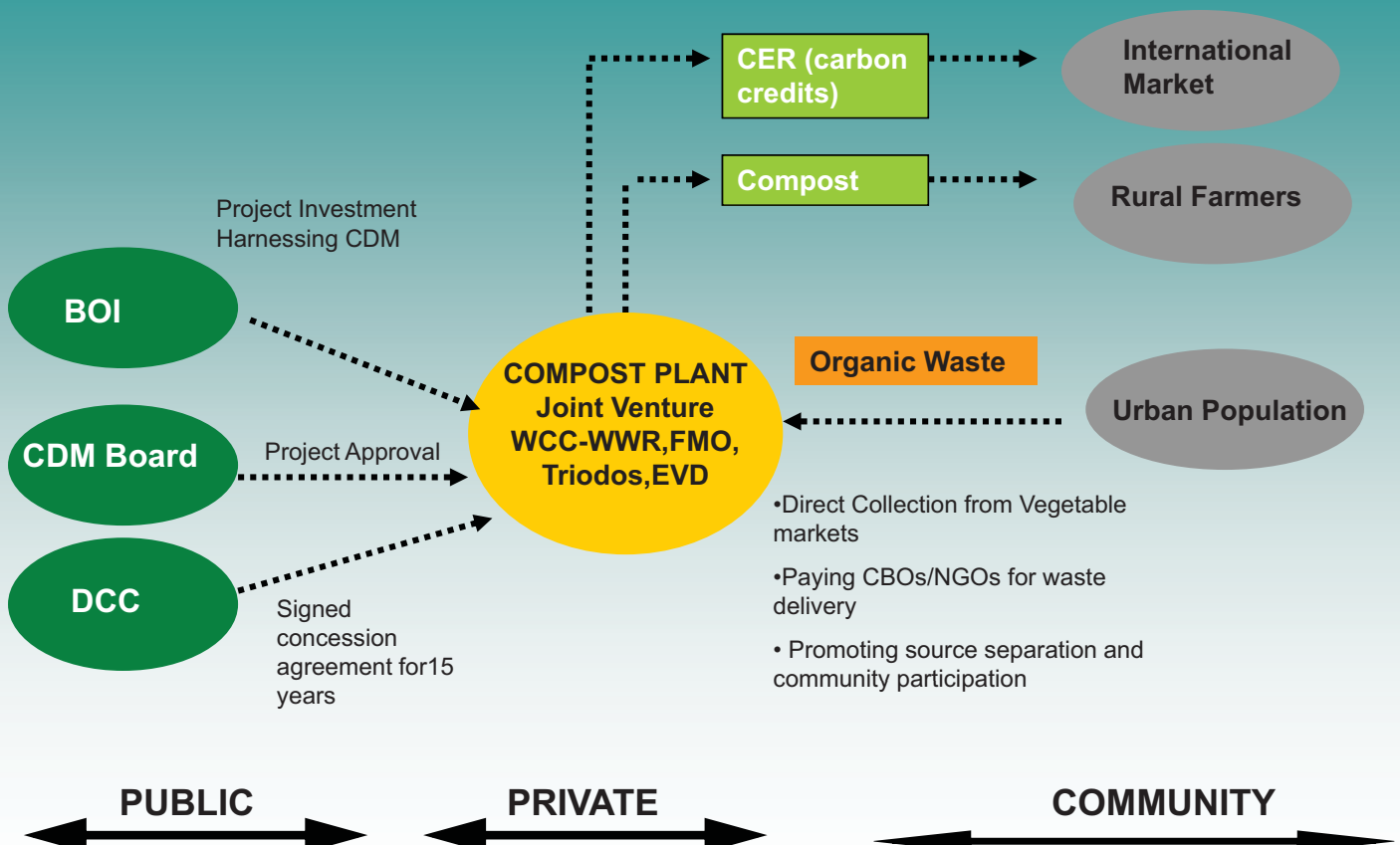
Development of the Project

7 January 2004	DCC gives NOC for preparation and implementation of the projects under CDM
29 February 2004	WC submits two CDM Projects to National CDM Committee for LFG Recovery (LFG & Composting) along with commitment letter of Dutch investor.
18 April 2004	National CDM Committee approved the projects
8 August 2004	National CDM Board headed by the PM office gives final approval of the project.
17 Sep 2005	First CDM Project of WC (Landfill Gas Extraction and Utilization) Registered with UNFCCC.
24 Jan 2006	DCC's Signs 15 years Concession Agreement for the 700 tons/day capacity compost plant
18 May 2006	Second CDM Project of WC (700 ton capacity compost plant) Registered with UNFCCC (after development of a new methodology AM 0025)
16 May 2007	Compost Project Registered from Board of Investment (BoI)
August 2007	Environmental Clearance (IEE) from DoE for Construction (Site Clearance)
Nov 2008	Compost plant in Bulta starts operation
March 2009	Government Approves Compost after lab test and Field trail

Project Partners

- Waste Concern (WC)** from Bangladesh. It is working in the area of waste management in Bangladesh since 1995. It is specialized in small and medium scale waste management projects especially composting. Waste Concern is involved in design and implementation of 47 nos. of compost/recycling plants distributed in 26 cities and towns of Bangladesh. Apart from Bangladesh, WC is also involved in waste composting projects in Sri Lanka, Vietnam and Pakistan.
- World Wide Recycling BV** from Netherlands. It is also working in the areas of waste management. This company is associated with VAR a large scale waste recycling company. It is specialized in large scale waste projects including composting
- FMO Bank, The Netherlands**
- Triodos Bank, The Netherlands**
- EVD, Dutch Ministry of Foreign Affairs (grant)**
- Dutch-Bangla Bank Ltd (local finance)**
- Dhaka City Corporation (concession agreement for waste collection)**
- UNDP (provided support to prepare the CDM project and validation)**

PARTNERSHIP APPROACH UNDER CDM PROJECT



Milestones of **the Project**

- **Waste Collection Target = 700 tons/day**
- **Production of Compost = 50,000 tons/year;**
- **Reduction of Green House Gas = 89,000 tons of CO₂e/ year;**
- **Job Creation for the Urban Poor = 800 nos.;**
- **Project Cost = 12 million Euro.**
- **Construction of 3 Plants Planned**

**First Plant of the Project and World's First Carbon Trading Based
Composting Project
From Organic Waste of Dhaka City
130 Tons Capacity Compost Plant
at Bulta, Rupgonj, Narayangonj**



Opening Ceremony on November 25, 2009

World's First Carbon Trading Based Composting Project From Organic Waste of Dhaka City



Opening Ceremony on November 25, 2009



Project Cost

- Cost Euro 2.5 million (plant capacity 130 tons) at Bulta
- Total Cost for three compost plant is Euro 12 million



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

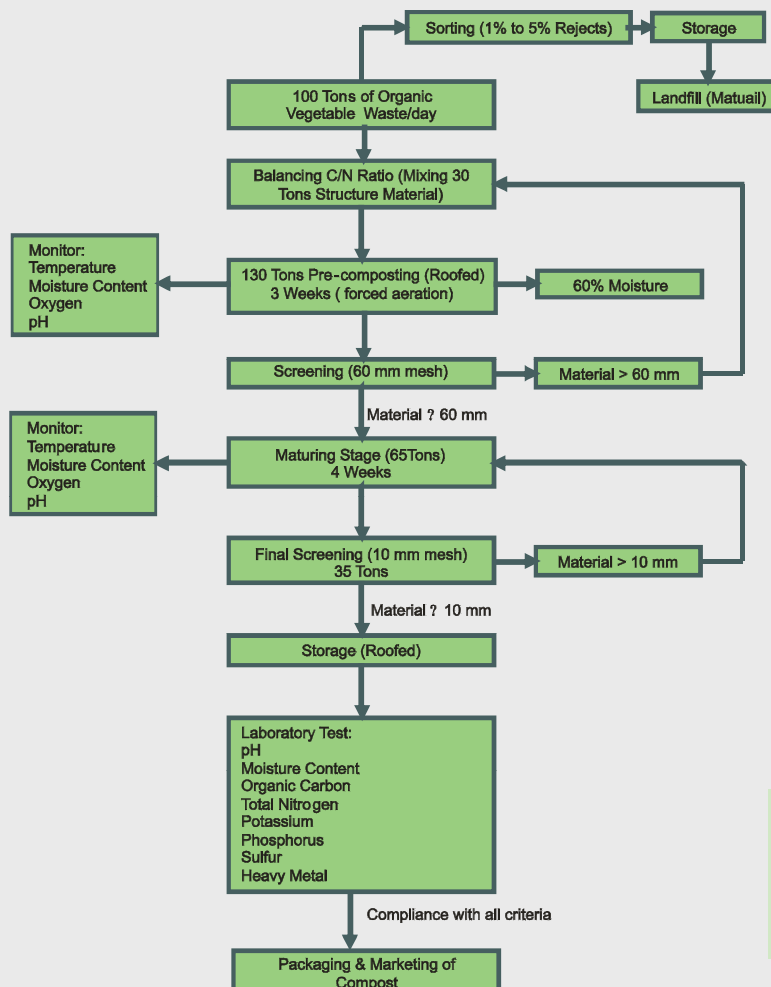
Basic Information of the Plant

Basic information:

- Total plant area: 14744 sq. M.(11.015 bighas)
- Employment creation: 90 persons
- Organic waste recycled: 130 tons/day
- Production capacity: 32-39 tons/day
- GHG emission reduction: 15600 tons CO₂/yr.
- Land filling avoided: 52195 m³/yr.

Special Features:

- 100% on-site waste water recycling
- Rain water harvesting from total roof and hard surface area
- Day care center for female staff
- Free meal for the workers
- Health insurance for the workers



Compost Manufacturing Process

Comparative Analytical Results of Fertilizer Samples

Name of Product : Waste Concern Jaiba Sar Company:

शुद्धता	अनुमानित मान	Analytical Results			Guaranteed analysis
		BARI	BINA	SRDI	
Physical					
Colour	Dark grey to black		Very dark greyish brown	Dark brown	
Physical condition	Non-granular form		Soft body, Granular in size	Non granular	
Odour	Absence of foul odour		Not smell	Odour less	
Moisture	Max. 15%	16.3	17.1	15.5	
Chemical					
pH	6.0 – 8.5	8.3	8.0	8.4	
Organic Carbon	10 – 25%	23.8	20.20	24.9	
Total Nitrogen (N)	0.5 – 4.0%	2.01	1.90	1.95	
C : N	Max. 20:1	11.8:1	10.63	12.8	
Phosphorus (P)	0.5 – 1.5%	1.7	2.2	1.25	
Potassium (K)	1.0 – 3.0%	2.68	2.52	2.60	
Sulphur (S)	0.1 – 0.5%	0.30	0.09	0.35	
Zinc (Zn)	Max. 0.1%	0.04	*	0.03	
Copper (Cu)	Max. 0.03%	0.009	*	0.008	
Arsenic (As)	Max. 20 ppm	19.3	*	*	
Chromium (Cr)	Max. 50 ppm	*	*	20.2	
Cadmium (Cd)	Max. 3 ppm	3.81	*	2.28	
Lead (Pb)	Max. 30 ppm	27.4	*	26.0	
Mercury (Mg)	Max. 0.1 ppm	*	*	*	
Nickel (Ni)	Max. 30 ppm	16.85	*	26.1	
Inert material	Max. 1%	*	*	*	

*Not analysed

SK

F:\FERTILIZER\26 th meeting\Analytical Result (Edited).doc

Complies with GoB Compost Standards of 2008



From August To November, 2008: Field Trial of Compost Produced by WWR Bio on Rice

Results:

- ✓ Reduces Use Of Chemical Fertilizer By 25% -50%
- ✓ Increase Yield up to 30%



July 2008 compost approved by the national technical committee of fertilizer under the Ministry of Agriculture

Mar 8 2009 national fertilizer committee approves the compost produced by WWR Bio

Pro-Poor Elements of the Project



Input

➤ **Collection**
(Organic Waste From Markets)

➤ **Saving**
DCC cost

Pro-poor element

- **700 tons/ day** of waste collection Starting from 100 tons/day
- **Job Creation**
400 new jobs



Process

➤ **Aerobic Composting**

➤ **Saving**
Landfill Area

Pro-poor element

- **Creating 800 new jobs**
- **Focusing on Waste Pickers**
- **Health Insurance**
- **Daycare Center**
- **Free Meal**



Output

➤ **Compost** (50,000 tons/year)

➤ **Carbon Credits**
(89,000 ton Co2e)

➤ **Producing**
environment friendly product

Pro-poor element

- **Cheaper**
- **Less Irrigation**
- **Soil Quality Improved**
- **Higher Yield**
- **Leads to higher income**

Before-After: Waste Collection System



Present Collection Practice



Improved Covered Collection (night time)

Parameters to be Monitored During Implementation



Weighing of Waste Input

Process Quality Control

Blowers used for forced aeration



Forced Aeration and Leachate Collection System to reduce Methane and avoid anaerobic condition



Regular Oxygen Monitoring

Parameters to be Monitored **During Implementation**

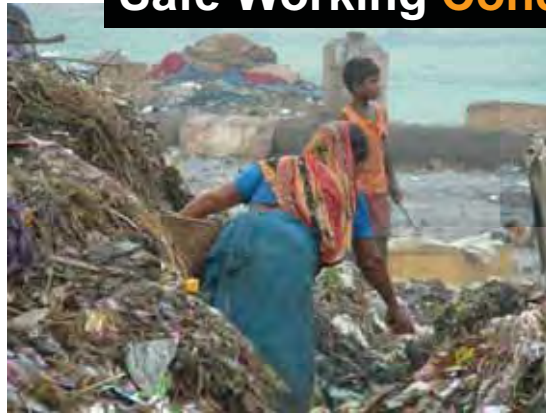


Temperature Control

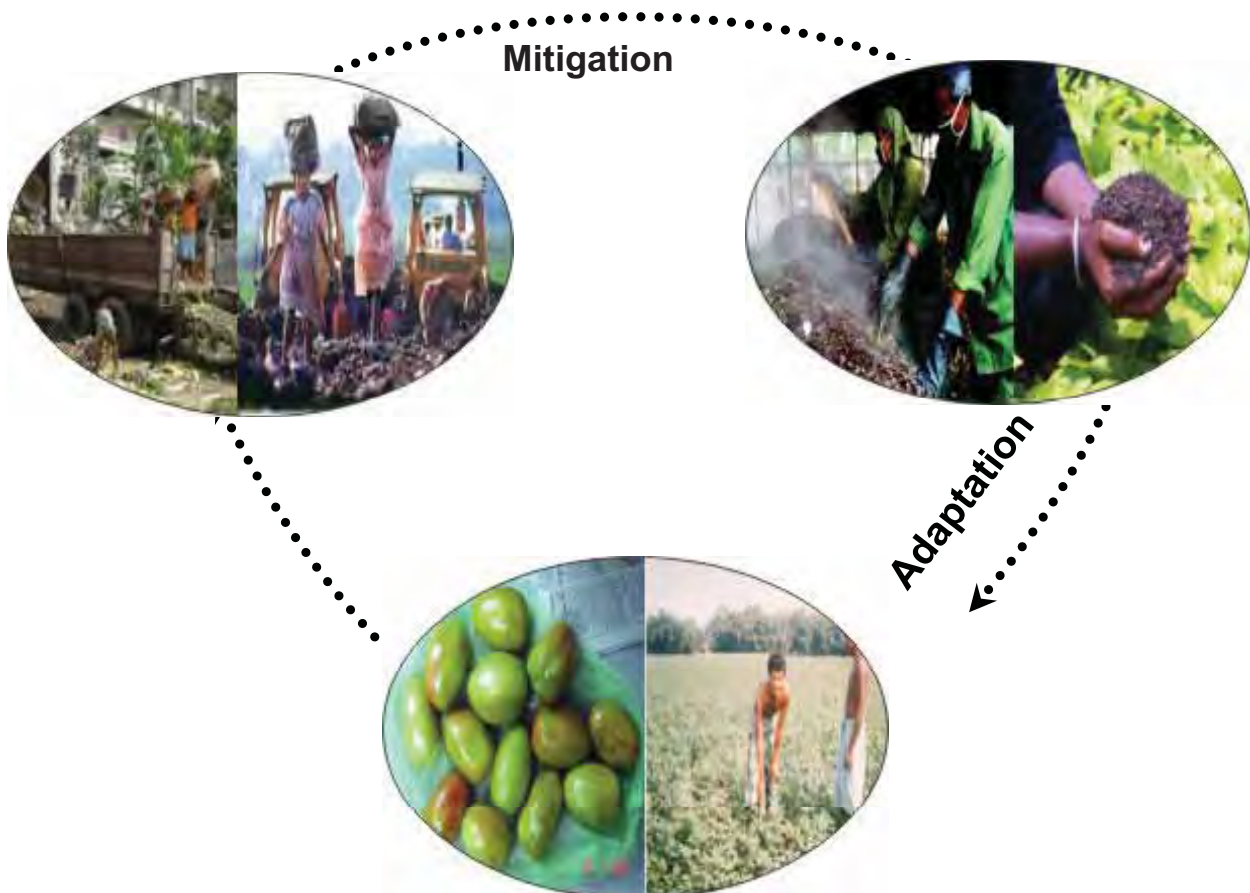
Certified and Approved **End product**



Safe Working Condition



Mitigation-Adaptation Loop



Barriers and Constraints

- Low level of awareness and capacity amongst the public, private and financial sectors about CDM opportunities.
- Several time consuming permissions/clearance required to implement CDM projects in Bangladesh.
- Lack of financial and technological resources to implement CDM projects.
- Transaction cost is high specially for small projects.
- Lack of enough baseline data.

Way Forward

- **53 (fifty three) permissions/clearance required for this project before implementation.**
 - ✓ *There is a need to simplify the Clearance procedure. We also need to enhance the capacity of the staffs and officials of public and private sector to understand the complexity of CDM projects.*
 - ✓ One stop approval process for CDM projects should be introduced (CDM/BOI/Central Bank/Line Ministry) to encourage CDM investment.
- **Many projects such as composting, biogas, improved stove, forestry can be implemented having pro-poor elements.**
 - ✓ There is a need to identify these kind of projects which has both the adaptation and mitigation benefits.
 - ✓ There are many investors keen to invest in projects which has both mitigation and adaptation benefits.

Thank You