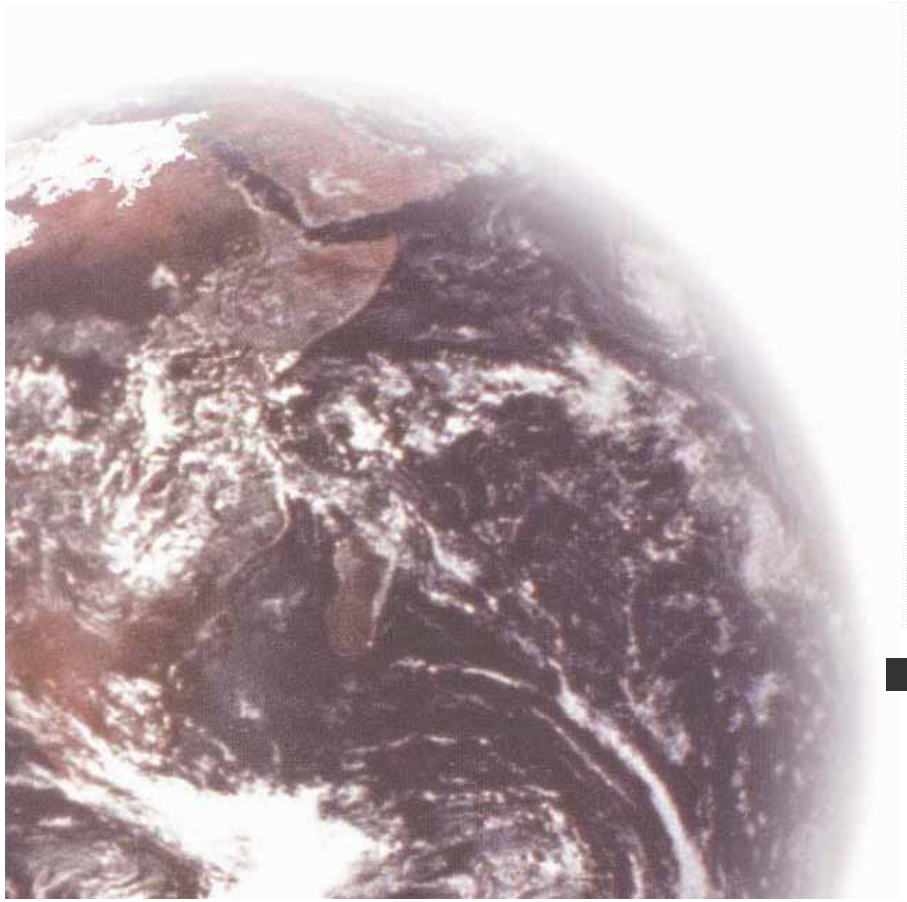
Public-Private-Community partnership for the 3Rs promotion in Bangladesh

by A. H. Md. Maqsood Sinha,
Waste Concern
Bangladesh



Plenary Session 4: Implementing 3R Programmes and Strategies at Local, National and Regional Level

Second Meeting of the Regional 3R Forum in Asia
Kuala Lumpur, Malaysia
4-6 October 2010
Theme: “3Rs for Green Economy and Sound Material-Cycle Society

WASTE CONCERN

web: www.wasteconcern.org

Presentation Outline

1. Present Situation Waste
2. Approach of Waste Concern
3. Public Private and Community Partnership (PPCP) Model
4. Impact of PPCP on Economy
5. Recent Policy Impact of 3Rs Initiative
6. Key Lessons

Present Situation

Source of Waste

Mixed Waste

Waste Bins Demountable Containers

Transfer Stations

New Types of Waste Emerging in the Waste Stream

Rapidly changing consumption patterns are generating significantly increasing proportions of toxic chemicals in industrial waste, hazardous hospital waste, large quantities of electronic waste is a growing concern for Bangladesh

PROBLEMS

- ✓Water Pollution
- ✓Spread of Disease Vectors
- ✓Green House Gas Emission
- ✓Odor Pollution
- ✓More Land Required for Landfill

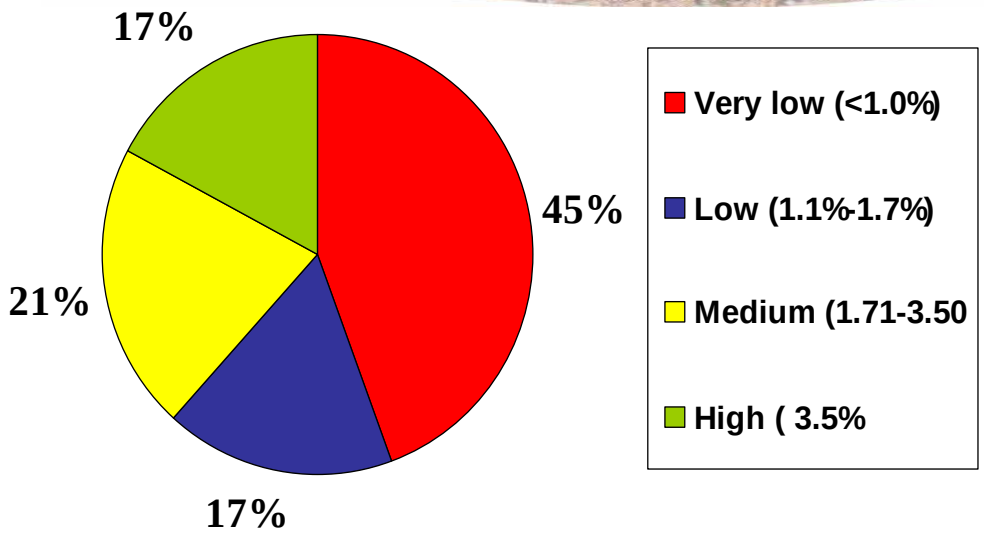
High organic matter >>(more than 70%)
High moisture content >>(more than 50%)
Low calorific value >>(less than 1000 Kcal/Kg)

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

Depletion of Organic Matter From the Soil

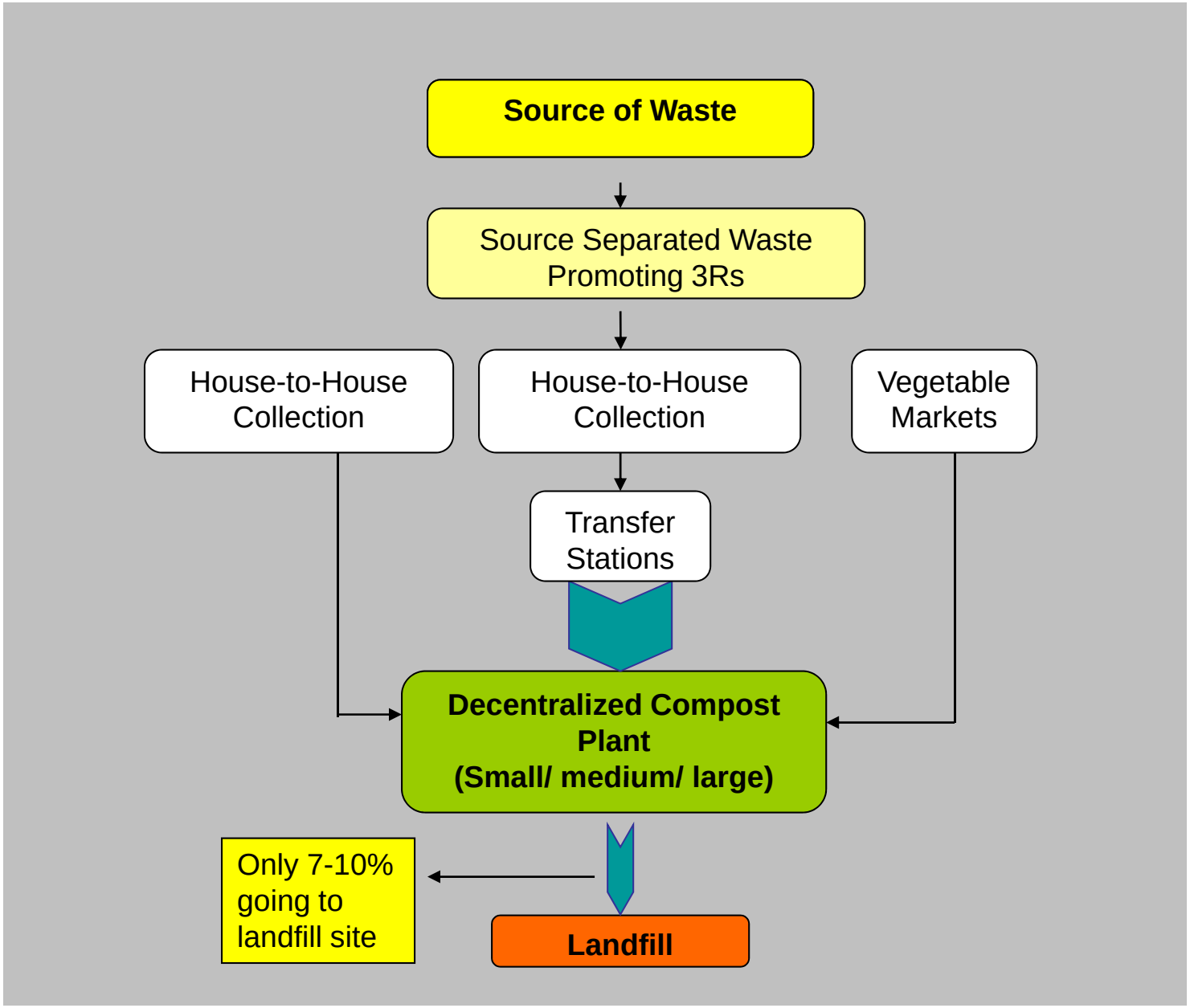
83% of cultivable land in Bangladesh has **less than 3.5% organic matter** (more than 3.5% is considered to be good soil)

Causing a Serious Problem of Food Security

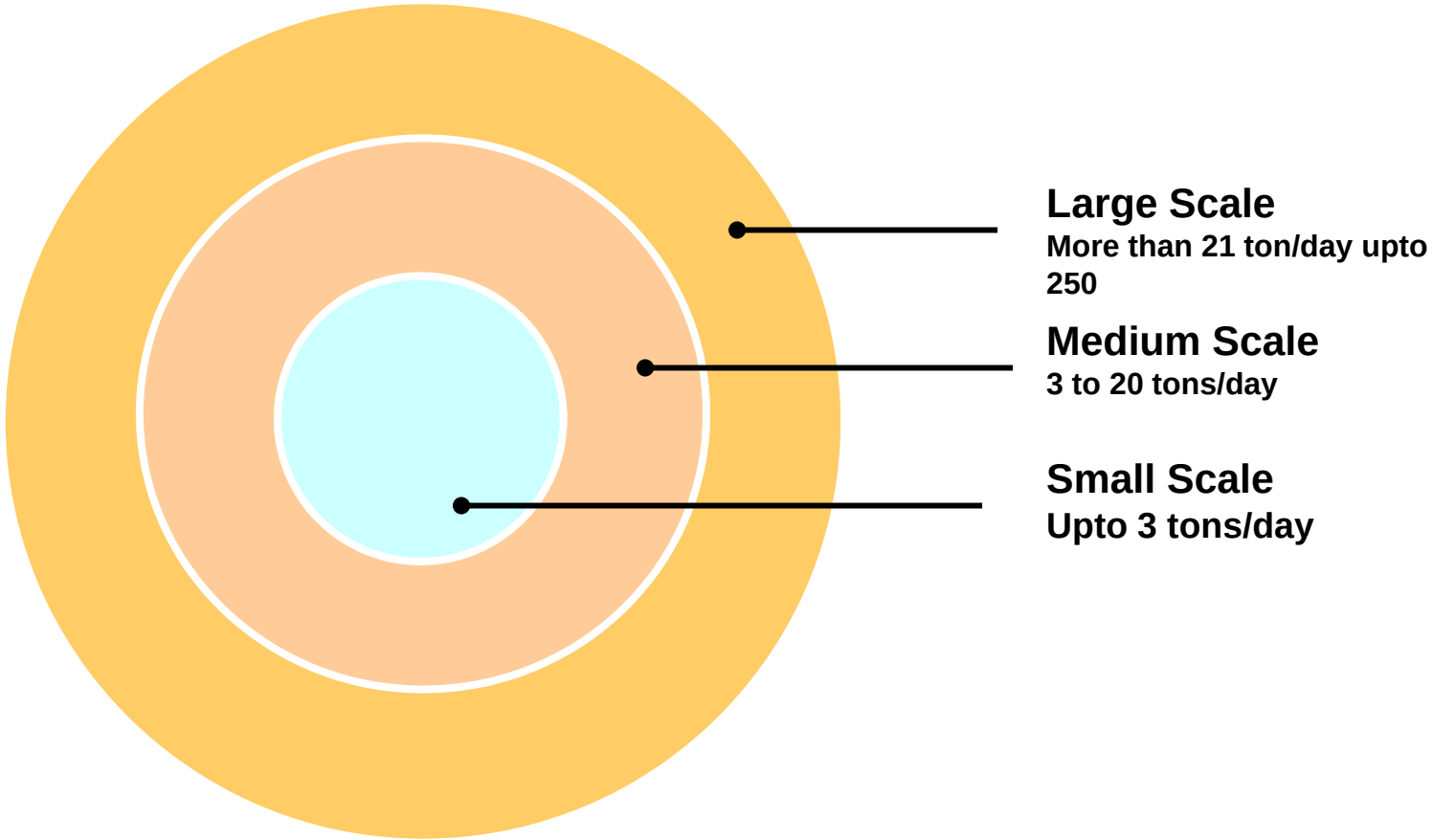


Pie Diagram Showing Depletion of Organic Matter From the Soil of Bangladesh

Approach of Waste Concern



Different Scale of Waste Concern's Composting Model



• The flexibility of Waste Concern's composting model is such that it can be adapted to any situation both in urban and rural areas.

• Moreover, it can be implemented in slum areas. It can be implemented on a small scale, medium scale, or large scale. The small scale model allows for 3 tons of organic waste to be processed daily, while the medium scale model permits processing 3 to 20 tons of organic waste per day. More than 21 tons of organic waste can be processed daily using the large scale model.

•***Apart from Production of Compost this model is reducing Green House Gas***

School Composting of American International School Dhaka (AISD)

Composting with Institutional Waste

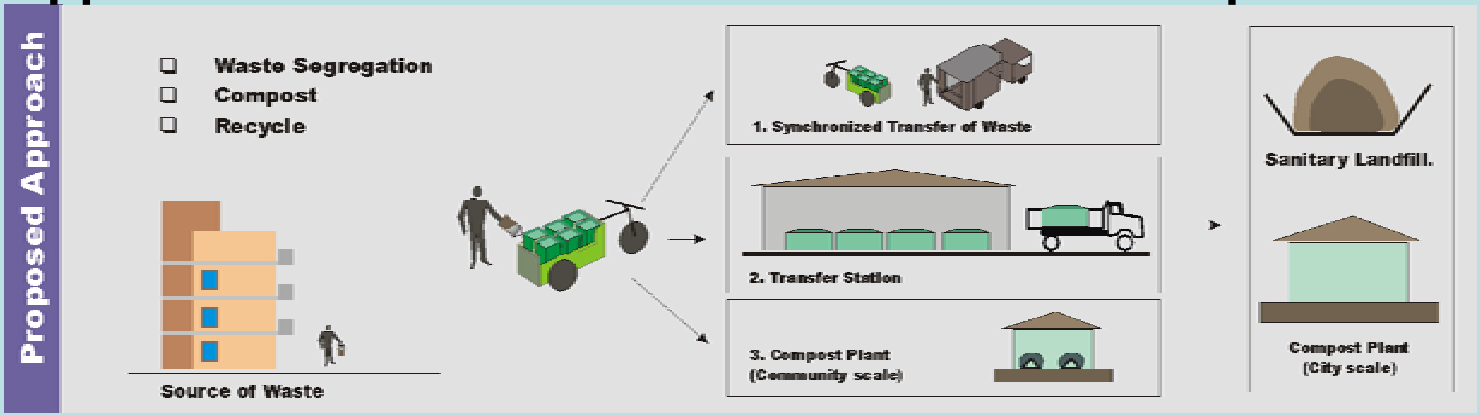
Waste Concern's Approach

Small Scale Compost Barrel Units in Rural and Urban Areas of Bangladesh

Waste Concern's Approach

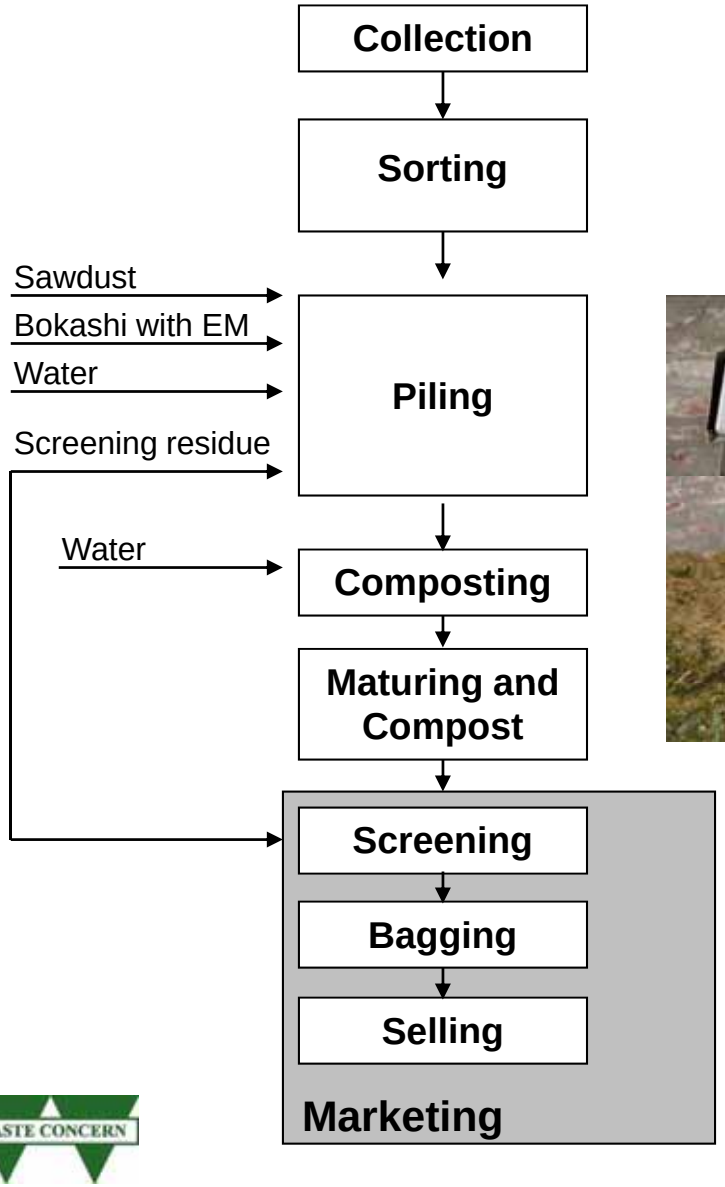
Compost Plants in the Urban Areas of Bangladesh

Approach of Waste Concern Based on 3R Principle



•Training,
•Awareness Raising
•Promotion of 3Rs
→ •House to House Waste Collection
→ •Decentralized Composting Community Scale/ City Scale
→ •Marketing of Compost
•Promotion of Organic Farming

Box Method Composting for Small Towns (Small & Medium Scale)



WASTE CONCERN

Box Method Composting for Small Towns (Small & Medium Scale)

Decentralized Approach of Composting Using Carbon Credits

Baseline Situation

Methane Emission

Waste

City Authorities Collecting

Existing Practice: land filling of waste

CDM project

No Methane Emission

Registered 700 tons/day Compost Plant with UNFCCC

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

Examples of 3R practice: Dhaka experience CDM

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"

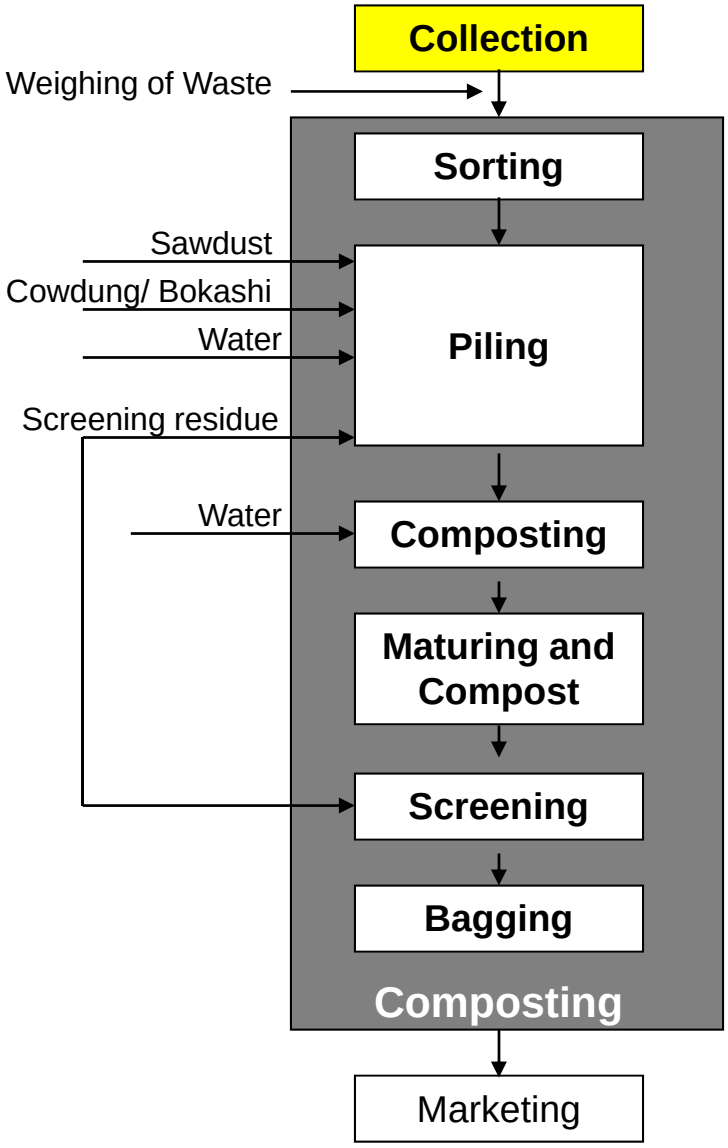
Source

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

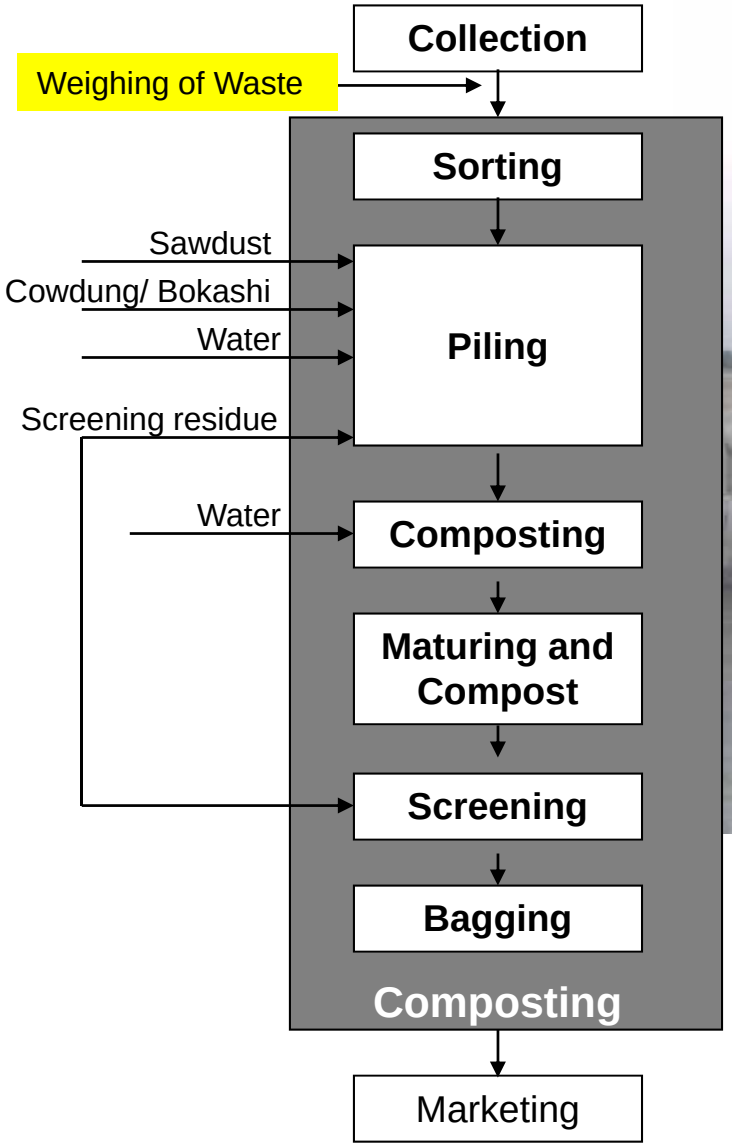
www.wasteconcern.org

Different Steps of Composting Process



Collection

Parameters to be Monitored During Implementation

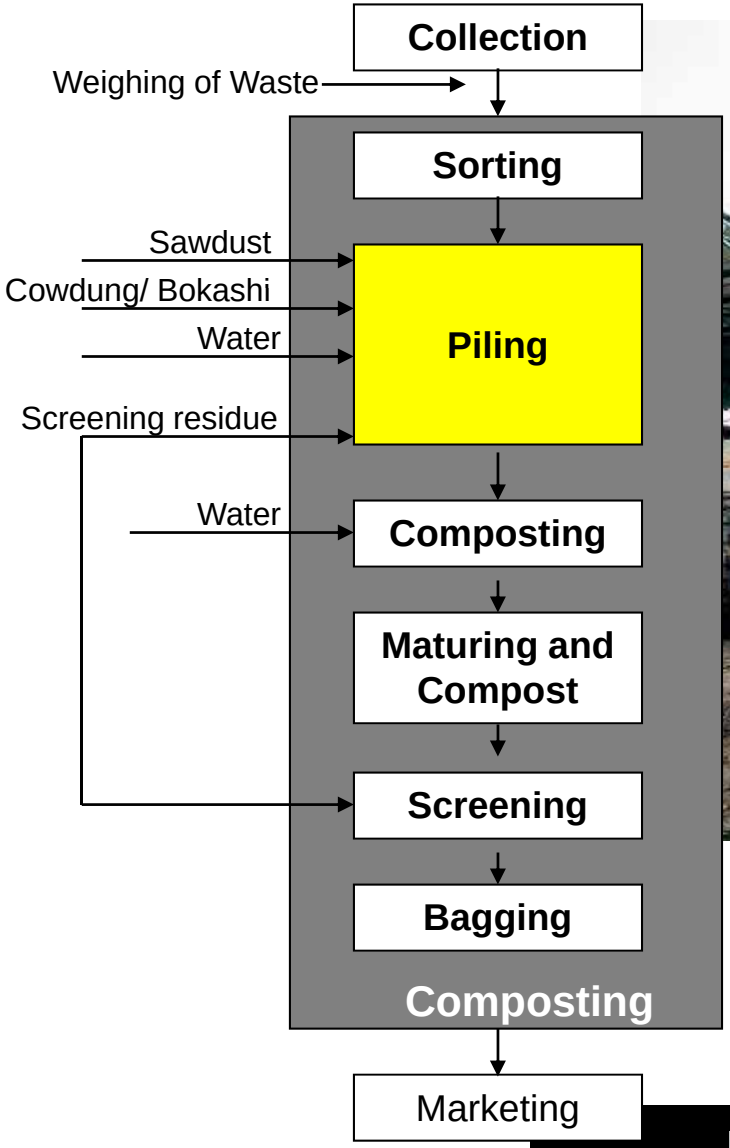


Weighing of Waste Input

Parameters to be Monitored During Implementation

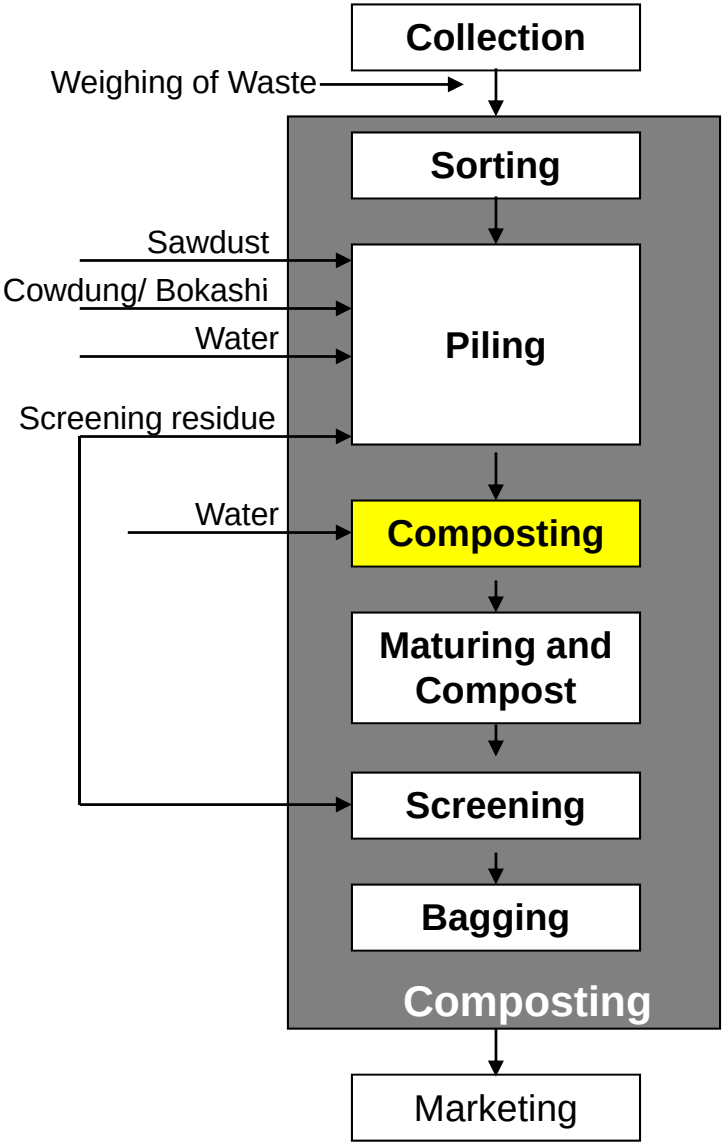
Unloading of Incoming Waste and Preliminary Sorting

Parameters to be Monitored During Implementation



Piling of Waste in the Pre-composting Box

Parameters to be Monitored During Implementation



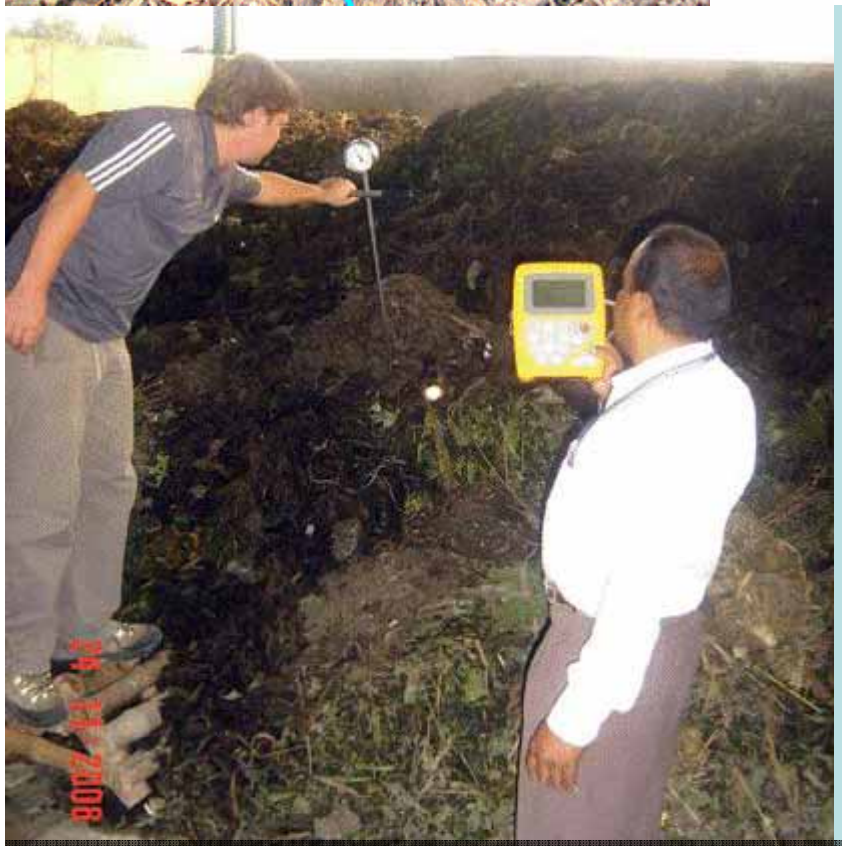
Moisture Control

Reuse of leachate water

Parameters to be Monitored During Implementation

Temperature Control

Process Quality Control

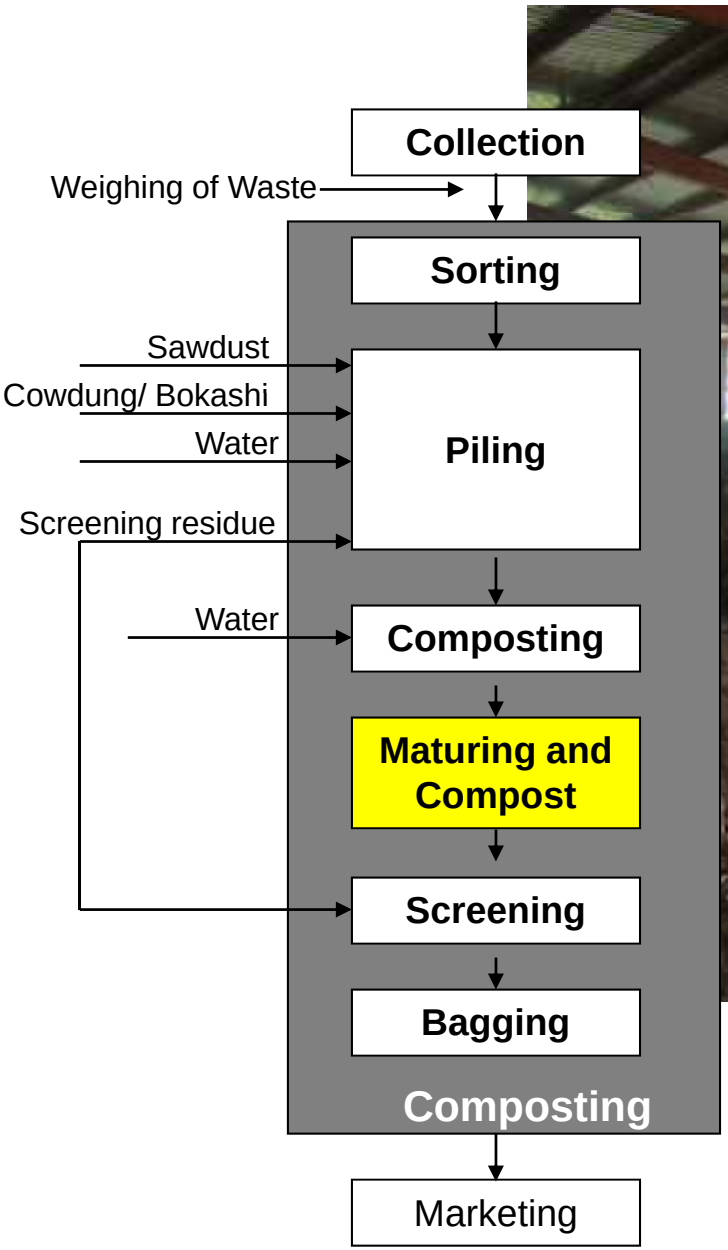


Regular Oxygen Monitoring

Process Quality Control

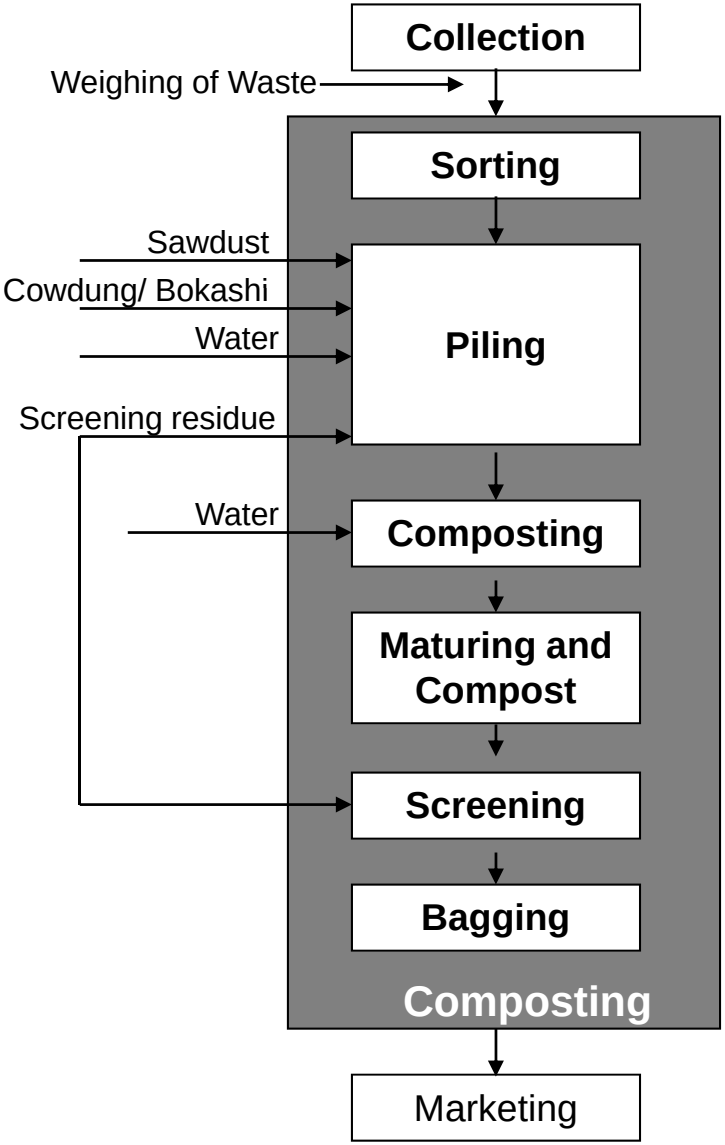
Forced Aeration by Blowers to Provide Oxygen in the Compost Pile

Different Steps of Composting Process

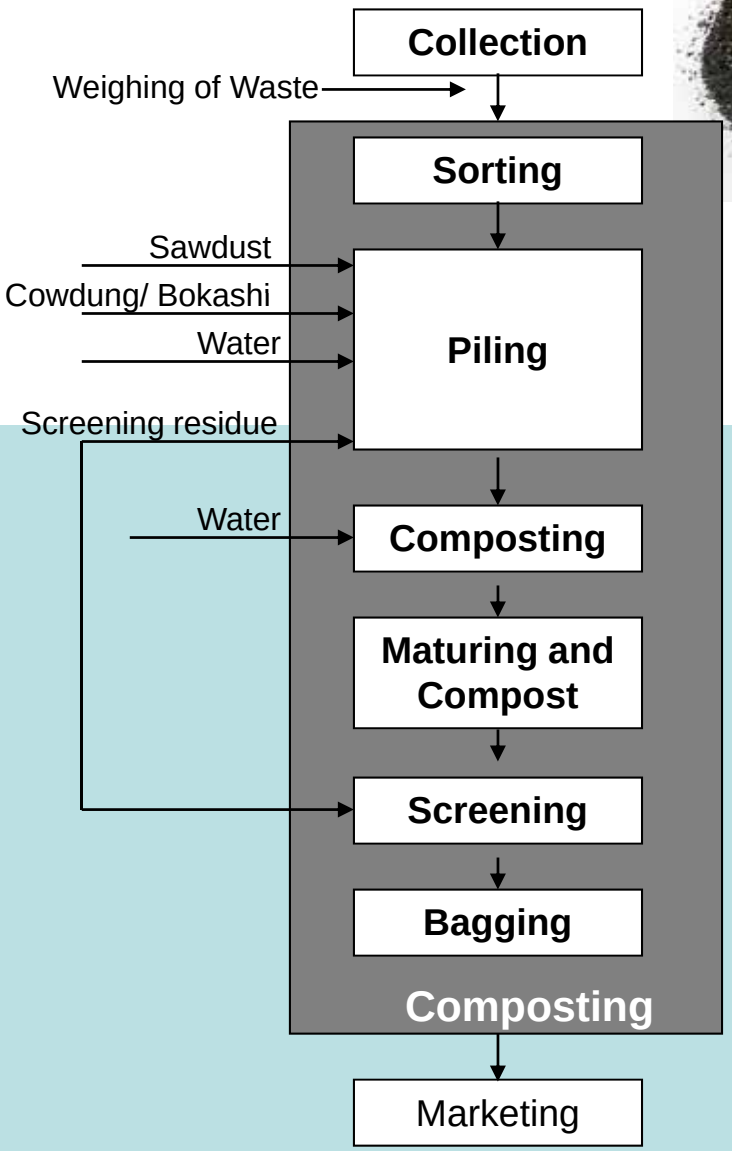


Maturing of Compost

Different Steps of Composting Process



Compost Produced from Organic Waste



Monitoring of Composting Process to Claim Carbon Credits in Composting Projects

Data Regarding Amount of Waste Composted

Weigh bridge is required to collect the data regarding amount of waste composted . **CALIBRATION of Weigh Bridge is MUST**

Temperature Data

Temperature meter is required to record temp data and to prove that the process is aerobic. **CALIBRATION of Temp Meter is MUST**

Oxygen Data

Gas meter is required to record % of oxygen in the pile and to prove that the process is aerobic. Oxygen level must be > 10% in the pile. **CALIBRATION of Gas Meter is MUST**

Data Regarding Amount of Compost Sold

Weigh bridge is required to collect the data regarding amount of compost sold. **CALIBRATION of Weigh Bridge is MUST.** Sales Invoice and name of the dealer marketing compost and location of use of compost is also required.

Data Regarding Energy Consumption

Electricity and Diesel Bill. This data is required to calculate on plant emission to produce compost.

Different Economic Outputs from IRRC

1 ton
Organic Waste

Composting

Produce1/4 ton
(0.25 tons of
Compost

1 ton
Organic Waste

Composting

Reduce 1/2 ton
Green House Gas

Quality Control

Comparative Analytical Results of Fertilizer Samples

Name of Product : Waste Concern Jaiba Sar Company:

উপাদান	অনুমোদিত মাত্রা	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. 0.05%	0.009		0.008	
Arsenic (As)	Max. 20 ppm	19.3	*	*	
Chromium (Cr.)	Max. 50 ppm	*	*	20.2	
Cadmium (Cd)	Max. 5 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

Complies with GoB Compost Standards of 2008

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

Quality Control Laboratory

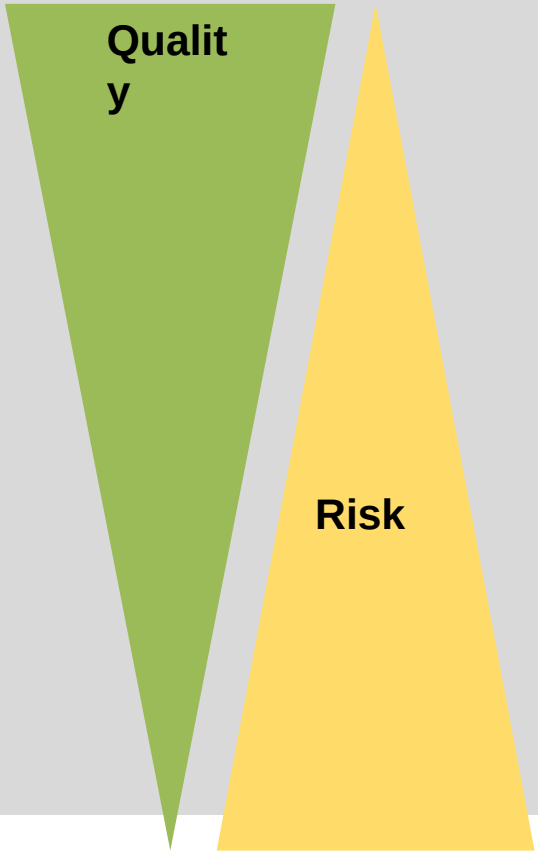
SOIL CONDITION AND IMPACT OF COMPOST

FIELD TRIAL EXPERIENCE

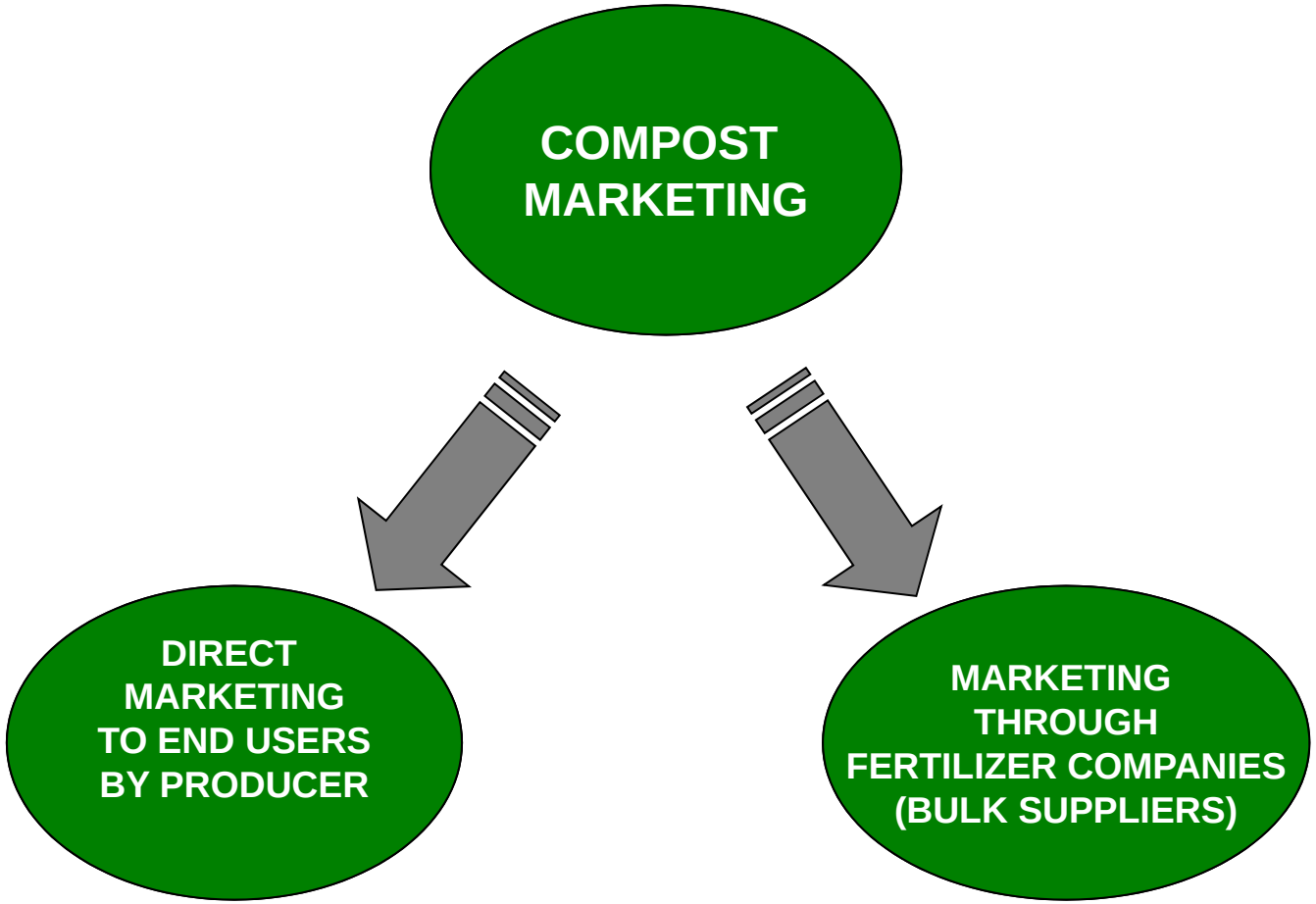
Field trail carried out by the Bangladesh Rice Research Institute (BRRI) of the Govt. of Bangladesh shows that Waste Concern's compost reduces the use of chemical fertilizer 25-30 increase yield by 30%

Input materials determine compost quality

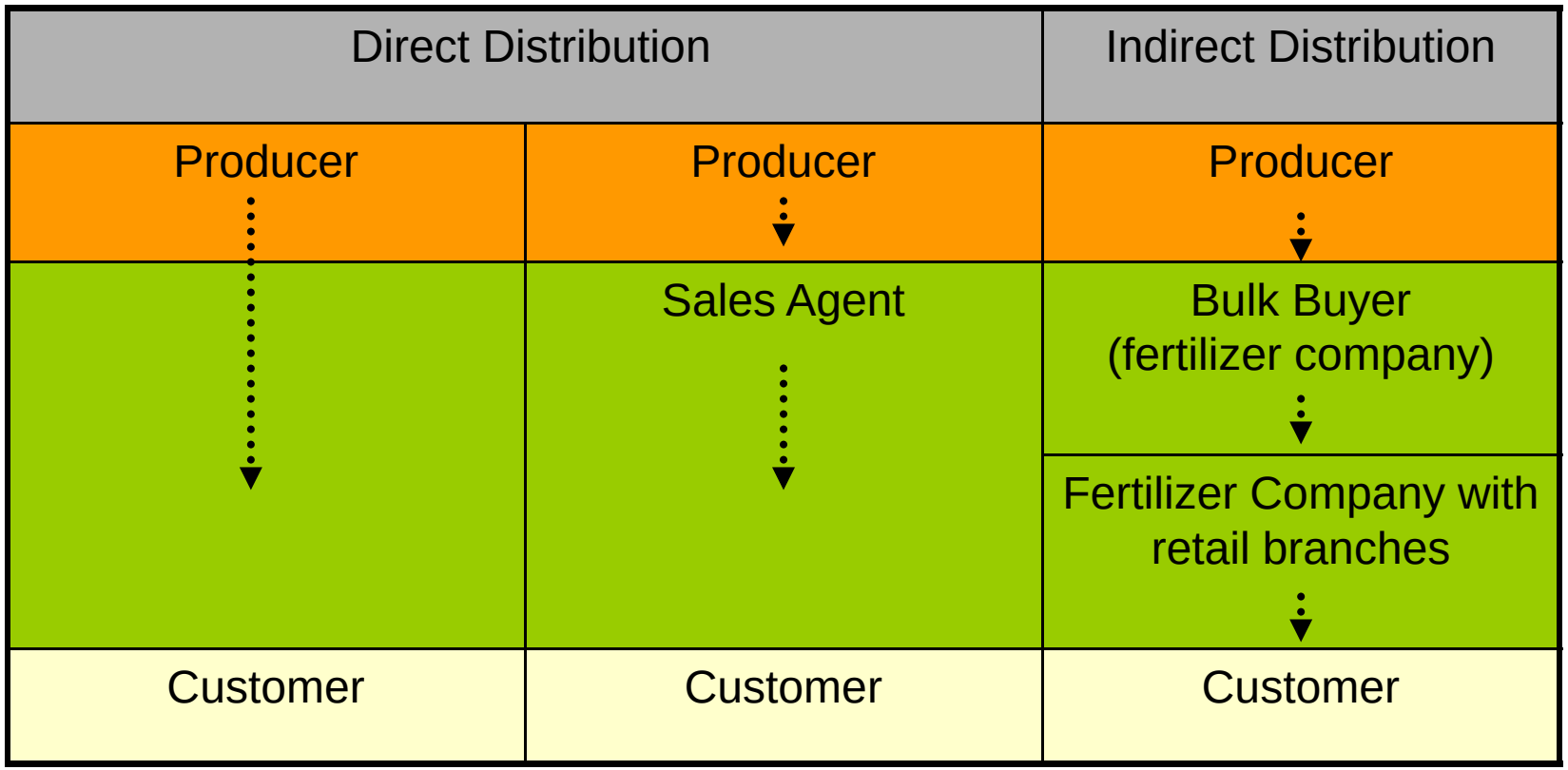
Source	Compost Quality and Risk of Contamination	Type of Contamination
Agricultural waste (manure, straw, fruit/vegetable residues)		Pesticide remaining, seeds
Vegetable market waste		Pieces of packaging waste and street sweepings
Segregated kitchen waste from households		Packaging, glass (depends on care taken in segregation)
Mixed household waste		Batteries, medicines, human waste (difficult to control)
Organic matter from landfill mining		All above plus healthcare and industrial waste. High proportion of sand or stones (no control of input material).



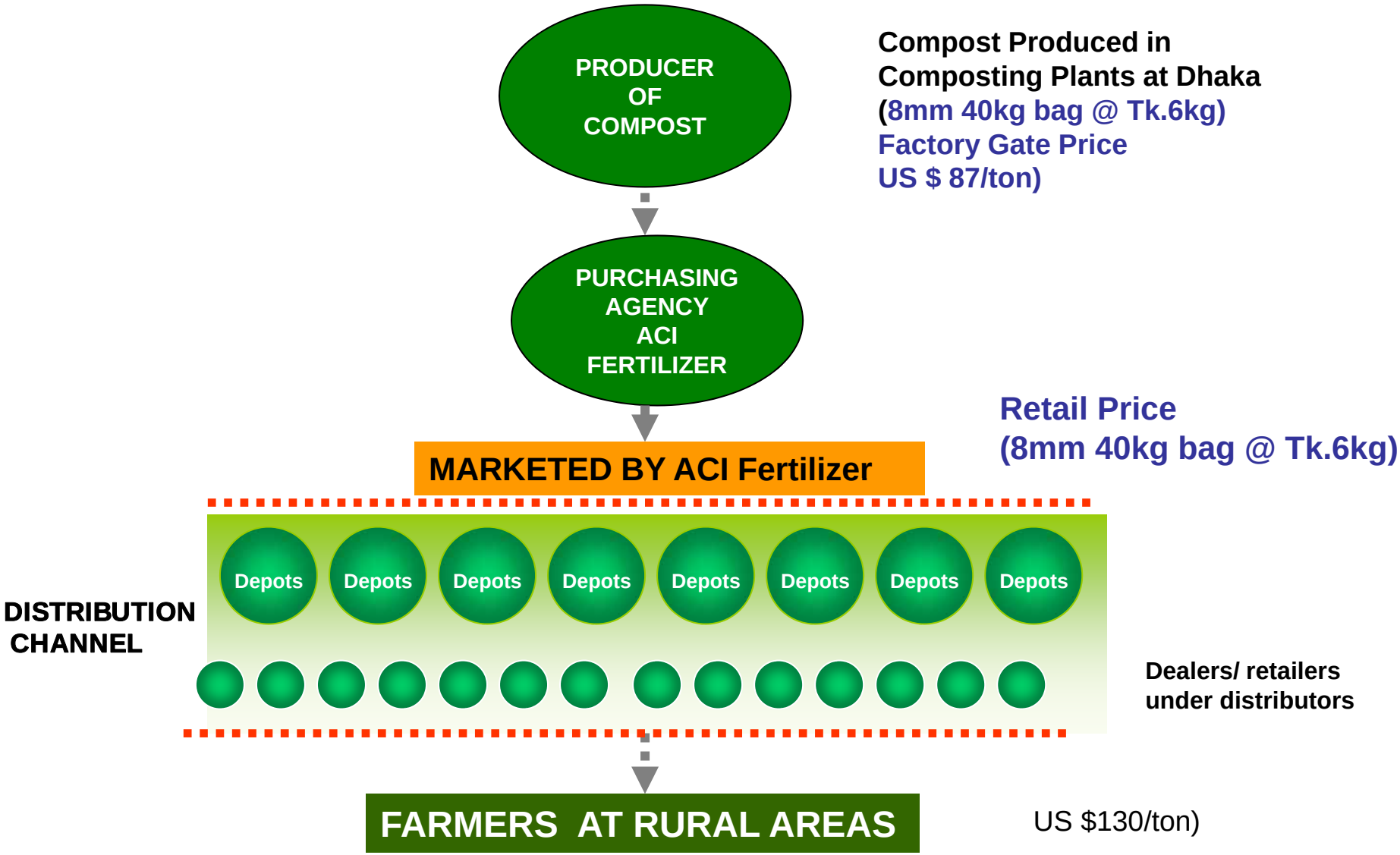
Compost Marketing & Distribution



Compost Sales and Distribution Models



MARKETING OF COMPOST BY WASTE CONCERN (INDIRECT DISTRIBUTION)



Compost Produced in Composting Plants at Dhaka
(8mm 40kg bag @ Tk.6kg)
Factory Gate Price
US $ 87/ton)

Retail Price
(8mm 40kg bag @ Tk.6kg)

Dealers/ retailers under distributors

US $130/ton)

Packaging and Branding of Compost

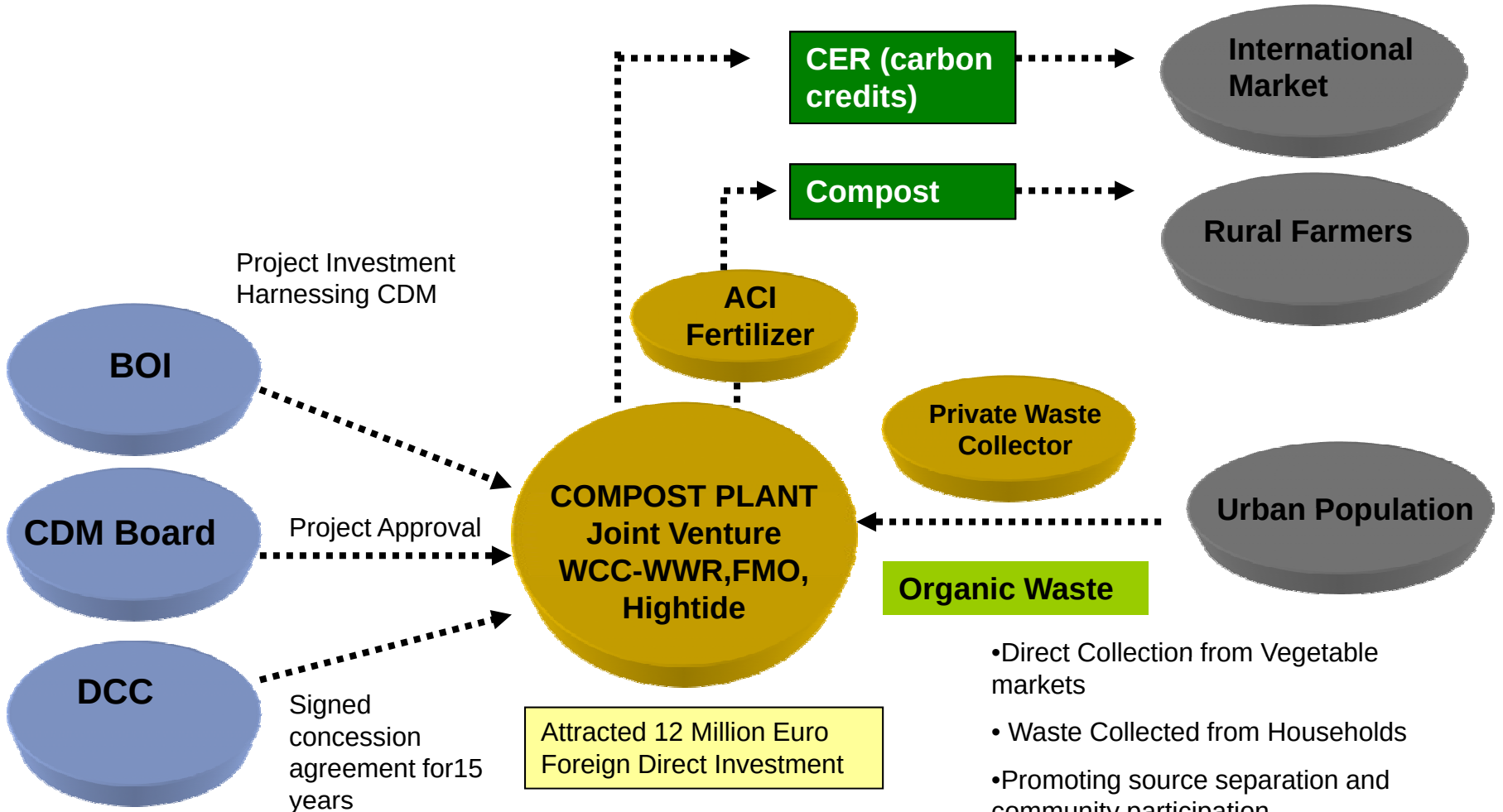
Improved Working Condition

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*

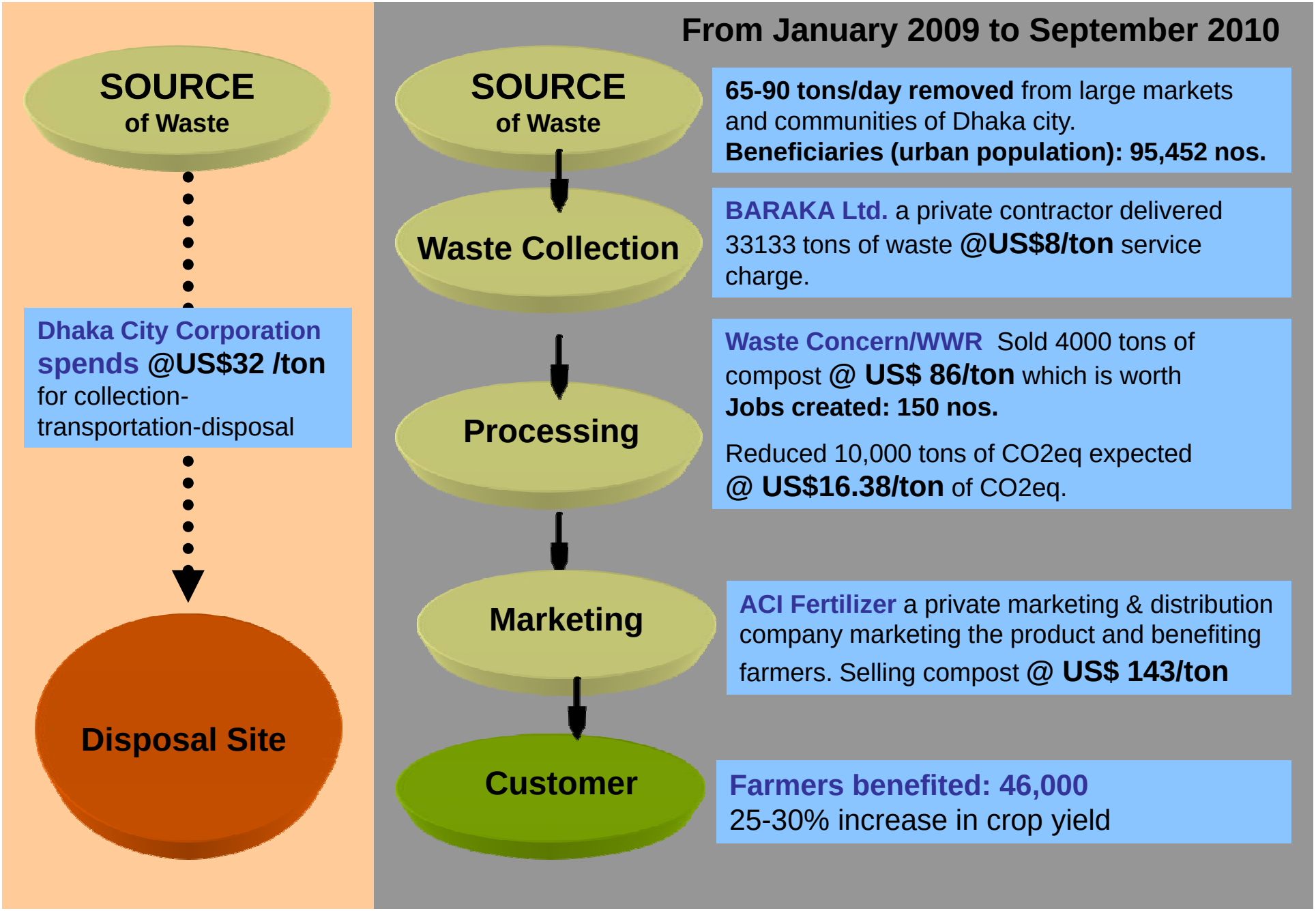
Informal Sector Given Better working Environment

Partnership Model



BOI-Board of Investment; DCC-Dhaka City Corporation; PPCP- Public Private Community Partnership

Impact of PPCP on Economy



Impact Scenario of the project

Impact of the project	From January 2009 to September 2010 (**65-90 tons/day** ton per day capacity)	2013 (700 ton per day capacity)
Cumulative amount of organic waste recycled (ton)	33133	224000
Compost produced	4000	33600
Cumulative amount of Co_2eq emission reduction	10800	143471
Total increase in waste collection capacity (ton) Baseline in 2008 was 50%	52.5%	65%
Director Jobs Created	150	350
Total Number of People Served (including urban population getting free waste collection service and farmers using compost)	141452	551138
Saved Budget of Dhaka City Corporation Considering USD 32 per ton of SWM management cost of DCC	US$ 1.05 million	US$ 7.19

Farmers: 46000 nos. considering 1 tons/hacter compost dose, per capita agricultural land 0.17 acres

Financial Aspect

- **130 tons/day capacity compost plant at Bulta**
- **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
- **Selling Price of Compost** = 6000 taka/per or US$ 86/ton

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
- Establishing a financing vehicle to provide equity fund on waste projects linked with carbon trading

Recent Policy Impact of 3Rs Initiative

National Coordinating Centre (NCC)

National 3Rs Strategy (final draft)

Draft National Solid Waste Management Handling Rule (being finalized)

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

Key Lessons in Organic Waste Management in Bangladesh

Methodology for UNFCCC	For the first time methodology for composting organic waste developed by Waste Concern and its Dutch partner World Wide Recycling B.V which was approved by UNFCCC (AM 0025)
Clear Guideline on PPP	Clear Guideline on PPP (with roles and responsibilities). PPP should be win-win situation for each partners.
Income from Carbon Trading	Income from Carbon Trading (CER/VER) is an important incentive to promote waste related projects cost recovery. It can increase the revenue by 30%
Standard for Compost	Government Standard for Compost and Endorsement by Agriculture Department/Ministry is important for marketing of compost. Role of Ministry of Agriculture is very crucial.
Quality Control	Quality of Compost is very important for marketing.
Source Segregation of Waste	Source Separation as well as proper sorting of waste is very important and it plays an important role in compost quality control.
Compost Testing Protocol	Role of the Ministry of Agriculture/Ministry of Environment in developing Field Application/test protocol for compost is necessary
Specialized Marketing Company	Involvement of private sector specialized in agro business in marketing of compost is needed
Inclusion of Informal Sector	Inclusion of informal sector in waste related projects is important

Thank You