

# Country Presentation Bangladesh

2<sup>nd</sup> Meeting of the Regional 3R Forum in Asia

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- There are more than 522 towns and cities, which are hubs of rapid economic development and population growth, generate thousand of tons of waste from domestic, industrial, commercial, health care facilities and agricultural sources that must be managed daily.

• Low collection coverage, unavailable transport services, and lack of suitable treatment, recycling and disposal facilities are responsible for unsatisfactory waste management, leading to water, land and air pollution, and for putting people and the environment at risk.

## Relationship of GDP & Population with Waste Generation

Year	Urban Population	Total Urban Waste Generation (Ton/day)	Per Capita Waste Generation Rate in urban areas Kg/cap/day	Per Capita GDP
1991	20.8 million	6493	0.31*	US \$ 220
2005	32.76 million	13,332	0.41**	US \$ 482****
2025	78.44 million	47,000	0.60***	-

\* World Bank, 1998, \*\*\* Waste Concern, 2005, \*\* UMP, 1999, \*\*\*\* GOB, 2006

## Current Situation of Wastes in Bangladesh – at a Glance

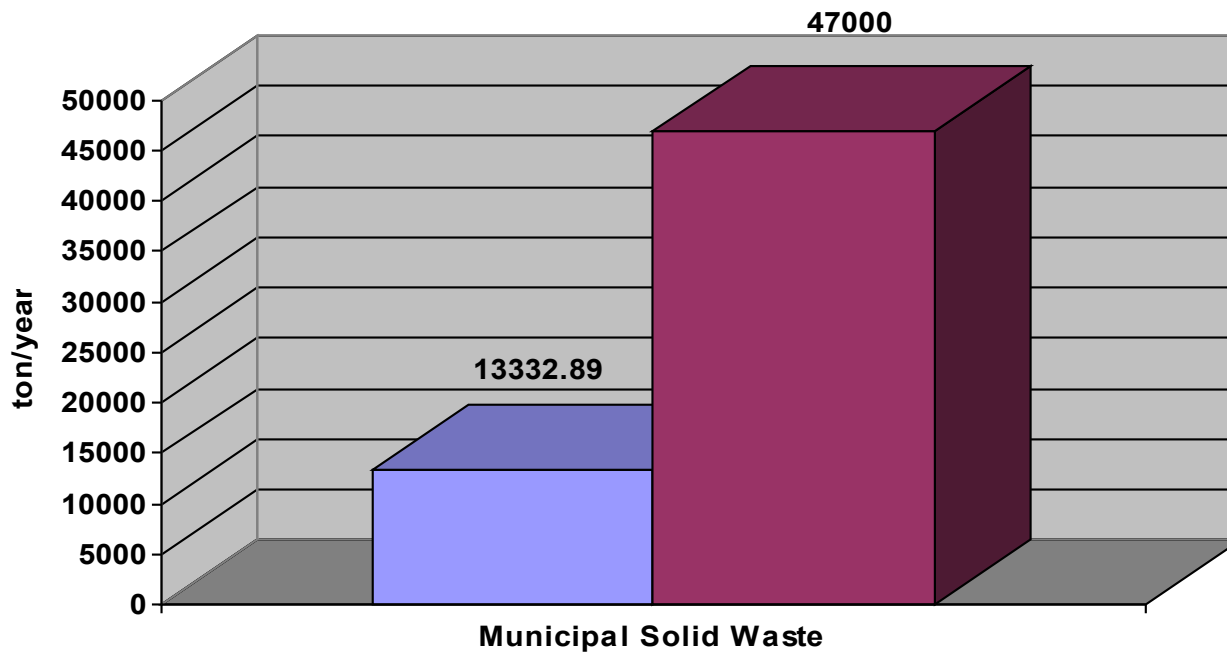
Category	Statistics	Data Source
<b>TOTAL VOLUME OF WASTES (tons/year)</b>		
Total volume of municipal solid wastes in urban areas	4,866,505 (2005) = <b>13,332.89tons/day</b> x 365 <b>3,000 tons/day</b> in Dhaka (2005)	Waste Concern (2005) JICA (2005)
Agricultural Waste	<b>65 million metric ton per year</b>	Waste Concern and Swiss Contact 2007
Industrial waste (hazardous) from seven selected sectors*	<b>109.47 million/cubic meter/year</b> (waste water) <b>0.113 million ton/year</b> ( sludge) and <b>26, 884 tons/year</b> (solid waste)	Waste Concern and ADB (2008)
Hazardous Medical Waste	<b>12,271 metric ton per year</b> (2007)	Waste Concern and ADB (2008)
<b>WASTE PER CAPITA (kg/per/day)</b>		
	<b>Urban: 0.41</b> (2005) <b>Dhaka City: 0.56</b> (2005) <b>Agricultural:1.68</b> (based on 2008 rural population)	Waste Concern (2008) JICA (2005)
<b>FUTURE WASTE PROJECTIONS (Total Waste Generation)</b>		
By 2025 (solid waste) 2012 (hazardous waste)	17,155,000 tons/year = <b>47,000tons/day</b> x 365 0.60 kg/per/day in Urban Areas <b>2472.07 million/cubic meter/year</b> (waste water), <b>2.81 million metric ton/year</b> (sludge) and <b>53,874 metric ton/year</b> ( solid waste)	UMP (1999), as cited by Waste Concern (2008) Waste Concern and ADB (2008)

\*These are textile, hospital clinics, tannery, pesticides, fertilizer, oil refinery and paper and pulp)

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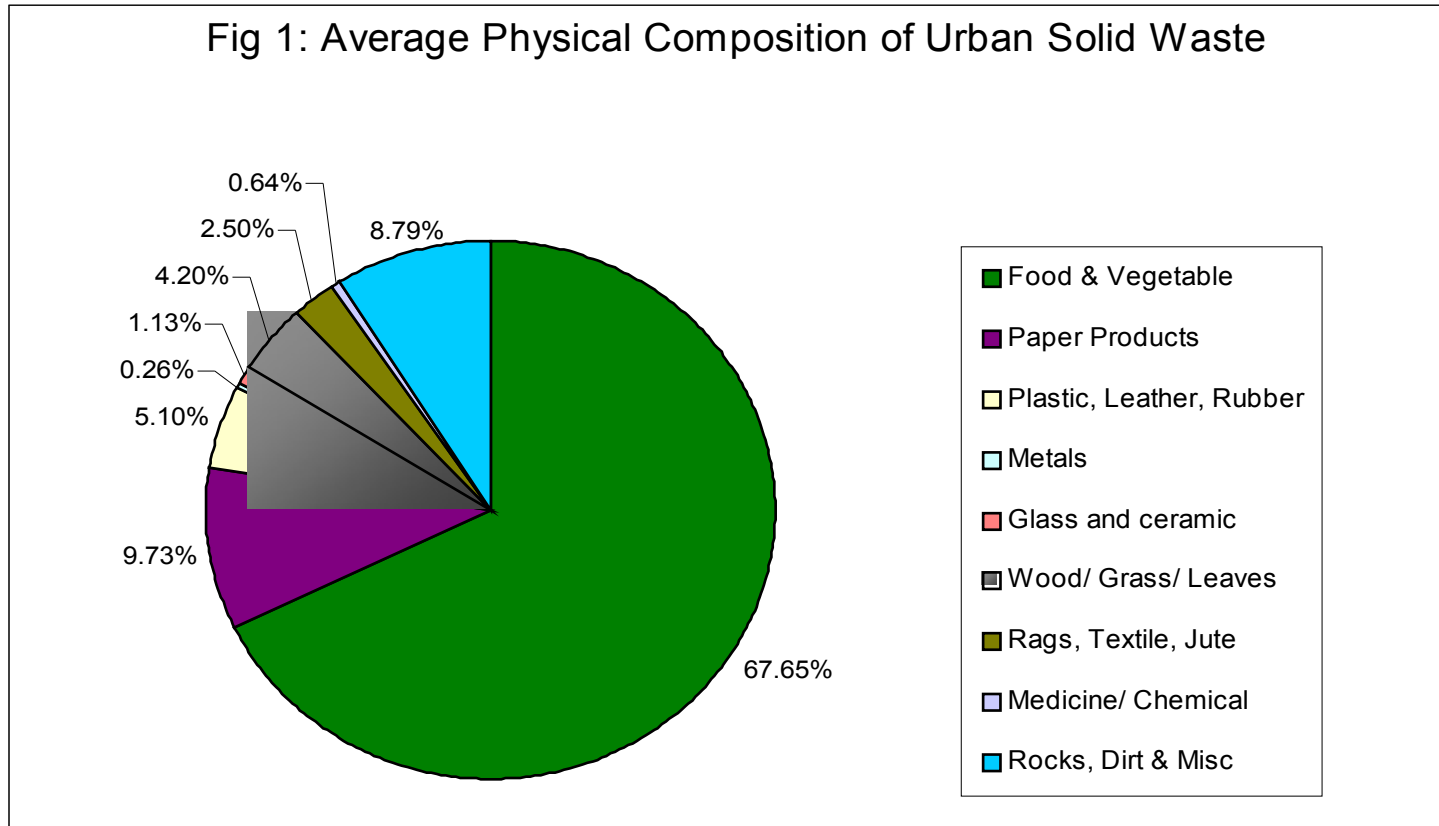
Category	Statistics	Data Source
<b>TOTAL VOLUME OF WASTES (tons/year)</b>		
<b>SOLID WASTE MANAGEMENT</b>		
Collection of waste (% of waste generated)	<b>44.30% - 76.47%</b> in major urban cities	Waste Concern (2005)
Solid waste disposal facilities	Mainly uncontrolled land-filling (except for the sanitary landfill at Matuail site in Dhaka, supported by JICA). No site or facility for treatment, recycling and disposal of hazardous waste.	Dhaka City Corporation and JICA (2007)
<b>E-WASTES</b>		
Use of electronic goods in year 2006	Mobile phones: <b>22,000,000 units</b> Personal computers: <b>600,000 units</b> Televisions: <b>1,252,000 units</b>	Waste Concern (2008)
<b>RECYCLE</b>		
Informal Sector	<b>120,000 urban poor</b> from the informal sector are involved in the recycling trade chain of Dhaka City. 15% of the total generated waste in Dhaka (mainly inorganic ) amounting to <b>475 tons/day</b> are recycled daily.	Waste Concern (2005)

### Solid Waste Projection



2005 2025

# Baseline Information on Selected Sectors of Waste



**High organic matter**

**>>(more than 70%)**

**High moisture content**

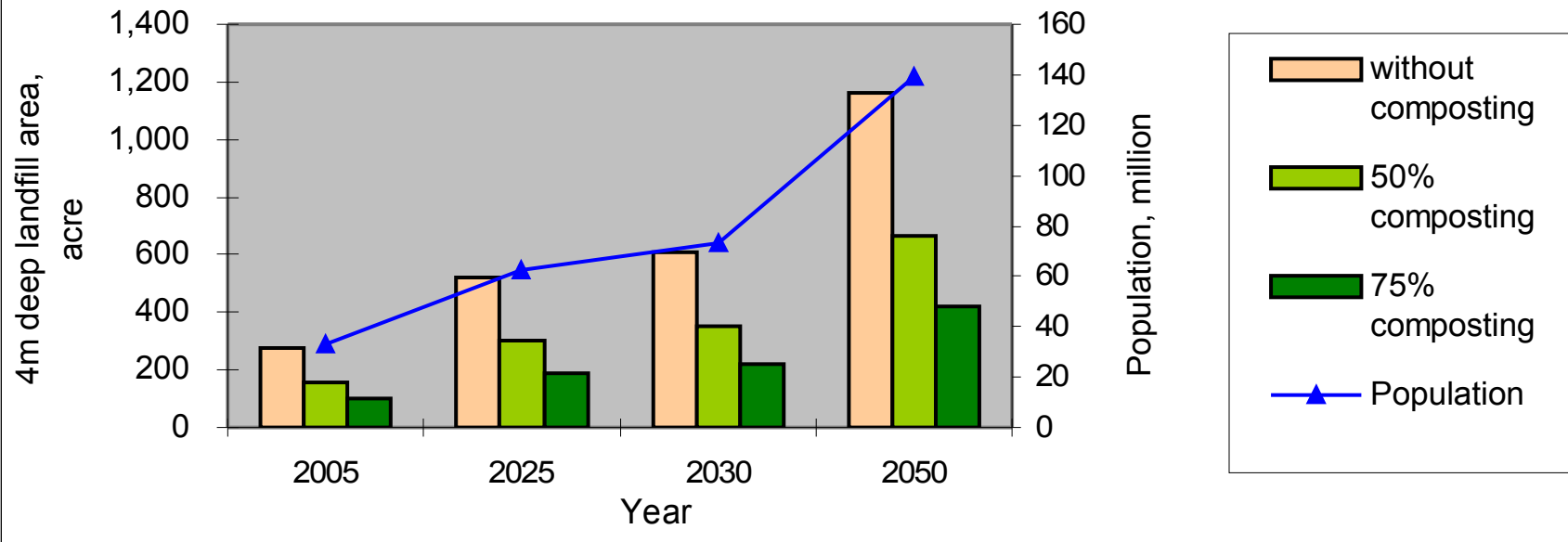
**>>(more than 50%)**

**Low calorific value**

**>>(less than 1000 Kcal/Kg)**

**Lack of space for disposal of solid waste**

### Projection of Future Landfill Requirement





## RECYCLING INDUSTRIES IN DHAKA CITY



**ALUMINIUM**



**PLASTIC**



**GLASS**



**PAPER**



**BONES**



**PLASTIC**

▪ **120,000** urban poor from the informal sector are involved in the recycling trade chain of Dhaka city

▪ **15%** of the total generated waste in Dhaka (mainly inorganic ) amounting to 475 tonnes/day are recycled daily.

Savings through recycling in Urban Areas of Bangladesh:  
**US \$ 15.29 million/ year** (in 2005)

## Green House Gas Emission Potential from Urban Solid Waste

City/Town	TWG*, (Ton/day)	GHG emission potential, million ton CO <sub>2</sub> e / year
Dhaka	4,634.52	0.76
Chittagong	1,548.09	0.25
Rajshahi	172.83	0.03
Khulna	321.26	0.05
Barisal	134.38	0.02
Sylhet	142.76	0.02
Pourashava	4,678.40	0.77
Other Urban Center	1,700.65	0.28
<b>Total</b>	<b>13,332.89</b>	<b>2.19</b>

\*Baseline methane emissions from biomass decay (tonnes of CO<sub>2</sub> equivalent),

BE<sub>y</sub> = Q<sub>biomass</sub> \* CH<sub>4\_IPCCdecay</sub> \* GWP<sub>CH4</sub>

Where,

Q<sub>biomass</sub>=Quantity of Biomass treated under the project activity (tonnes)

CH<sub>4\_IPCCdecay</sub> =IPCC CH<sub>4</sub> emission factor for decaying biomass (tonnes of CH<sub>4</sub>/tonne of biomass or organic waste)

GWP<sub>CH4</sub> =Global Warming Potential for CH<sub>4</sub>

# National 3R Goal

The national 3R goal for waste management is to achieve higher levels of waste reduction, reuse, and recycling and minimize waste disposal on open dumps, rivers, flood plains and landfills by 2015.

## Objectives of the National 3R Strategy

The main objective of this 3R strategy is to delineate ways and means of achieving national 3R goals through providing a uniform guideline for all stakeholders. Specific objectives of this strategy are to:

- address the key issues of waste management;
- define the roles of various actors; and
- guide the creation of enabling conditions for success.

## Priority Sector for 3R

- **Municipal solid waste**
  - Institutional
  - commercial waste
- **Industrial waste**
- **Biomedical waste**
- **Agricultural waste**

Based on the guiding principles and the key issues identified earlier, following strategies are recommended to promote 3R in waste sector:



- Waste is a Resource ( **Shift from waste management to resource management** )
- Source Separation of Waste
- Selection of Appropriate and Affordable Technology
- Technology should be Emissions-Reducing
- Cleaner Production
- Product-Life Extension
- Substance, Product or Technology Bans
- Industrial Symbiosis and By-Product Exchange
- Polluters Pay Principle and Buy-Back Provision
- Green Purchasing
- Environmental Management System (EMS)
- Supporting Informal Sector
- Gender Sensitive Approach
- Public-Private Partnership
- Correspondence between Service Received and Payment Made
- Link Waste with Climate Change

# 3R Related Policy Guidelines

Date	Title
<b>Policy</b>	
2006	<b>Draft National Urban Policy</b> • CDM and Recycling has been emphasized in this policy.
2008	<b>National Renewable Energy Policy</b> This policy is promoting production of biogas and other green energy from waste and also providing incentives such CDM to promote green energy projects.
1999	<b>National Agriculture Policy</b> According to this policy the government will promote use compost/organic fertilizer amongst the farmers to improve the soil productivity and food security
2005	<b>National Industrial Policy</b> This policy is recommended use of EMS and Cleaner Production practices amongst the industries
1998	<b>National Policy for Water Supply and Sanitation</b> • 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.
1998	<b>Urban Management Policy Statement</b> Recommend the municipalities for privatization of services as well as giving priority to facilities for slum dwellers including provisions of water supply, sanitation and solid waste disposal.
<b>Act</b>	
2006	<b>Fertilizer Act</b> Under this act compost has been promoted and standard of compost has been set by the government on 2008.
1995	<b>Bangladesh Environmental Conservation Act (ECA)</b> Recommends standards for disposal of different types of waste.

# 3R Related Policy Guidelines

Date	Title
<b>Rules</b>	
2008	<p><b>Biomedical Waste Management Rules</b> This rule recommends source separation of hospital waste as well as separate collection, transportation and treatment and disposal of all kinds of hospital and clinical waste.</p>
2006	<p><b>Lead Acid Battery Recycling and Management Rules</b> Under this rules collection and recycling has been improved.</p>
2005/ <u>2010</u>	<p><b>Draft National Solid Waste Management Handling Rule</b> 3R principle has been used.</p>
1997	<p><b>Bangladesh Environmental Conservation Rules (ECR)</b> Recommends waste disposal standards for mainly industrial wastes.</p>
<b>Strategy</b>	
2005	<p><b>National CDM Strategy</b> This strategy is promoting pro-poor CDM projects on waste sector by harnessing carbon financing</p>
2005	<p><b>Poverty Reduction Strategy Paper (PRSP)</b> 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.</p>
2005	<p><b>National Sanitation Strategy</b> 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.</p>



# 3R Related Policy Guidelines

Date	Title
<b>Action Plan</b>	
2005	<p><b>Dhaka Environment Management Plan</b> Waste recycling has been promoted, less land filling encouraged, EMS promoted among industries.</p>
2005	<p><b>Solid Waste Management Action Plan for Eight Secondary Towns in Bangladesh</b> Under the Secondary Towns Integrated Flood Protection (Phase-2) Project of Local Government Engineering Department, GoB. This action plan is based on 4 R principle i.e. reduce, reuse, recycle and recover of the waste.</p>
1995	<p><b>National Environmental Management Action Plan (NEMAP)</b> 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. 3R is being promoted under the Sustainable Environment Management Programme (SEMP) of NEMAP.</p>
<b>Other</b>	
2008	<p><b>Circular to Promote Compost by the Ministry of Agriculture (MoA)</b>, on 23 April 2008 Ministry of agriculture issued a circular to promote use of compost amongst the farmers to reduce the burden on the</p>
2004	<p><b>Private Sector Infrastructure Guideline</b> This guideline of the GOB has recommended private sector investment in waste management sector which includes all types of waste. It has also identified waste sector as one of the priority sector for private investment.</p>
2005	<p><b>Private Sector Housing Development Guideline</b> This guideline recommends to space in new housing areas for waste recycling specially composting and bio gas generation.</p>
2004	<p><b>Dhaka Declaration on Waste Management by SAARC countries</b> 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.</p>

# Existing Examples of Good Practices

- ❑ **Source Separation of Waste at Uttara Model Town (Sector 5)**
- ❑ **Community Based Urban Solid Waste Management in Bangladesh**
- ❑ **Composting of Waste in Slums**
- ❑ **School Composting Program of American International School Dhaka (AISD)**
- ❑ **Medium Scale Commercial Composting**
- ❑ **Large Scale Commercial Composting Using CDM**
- ❑ **Plastic Waste Recycling in Dhaka by Informal Sector**
- ❑ **Lead Acid Battery Recycling by Formal and Informal Sector**
- ❑ **Battery Buy Back for Recycling by Rahimafrooz**
- ❑ **Agricultural Waste Composting in Chok Singha by Village**
- ❑ **Agricultural Waste Used for Biogas Generation and Improved Cook Stoves**
- ❑ **Biomass/Poultry Waste Used for Commercial Power Generation**
- ❑ **Biomedical Waste Collection and Disposal in Dhaka and few cities/towns**
- ❑ **Environmental Management System (EMS) Practices in Several Industries**
- ❑ **Use of Biomass in Boiler- Example of a Private Furniture Manufacturer**
- ❑ **Recycling Training Center in Katchpur, Narayangang**

# Existing Examples of Good Practices

## Source Separation of Waste at Uttara Model Town (Sector 5)

### Fact Sheet:

Population: 105,913 (2006 )

Waste Generation: 51.16 ton/day (2006)

With Effective 3R practice can have following benefits

- **2781 tons/Year** waste recycled
- **PLASTIC WASTE 935.53 tons/Year** recycled
- **PAPER WASTE 1305.27 tons/ Year** of recycled.
- **RAGS, TEXTILE AND JUTE 540 tons/ Year** recycled
- Two truck full load of waste can be minimized in Uttar Model Town as a result can save estimated at Tk. 9,490,000 per year.



Recent Development

# Existing Examples of Good Practices

## Community Based Urban Solid Waste Management in Bangladesh



### ➤ Organic Agriculture

# Existing Examples of Good Practices

## Composting in Rural Areas of Bangladesh



Domar, Nilphamari



Bagha, Rajshahi



Domar, Nilphamari



Domar, Nilphamari

# Existing Examples of Good Practices

## Pilot 3R Project in Kushita



# Existing Examples of Good Practices

## Replication in 26 cities and Towns of Bangladesh



# Existing Examples of Good Practices

## Composting of Waste in Slums

### Compost Barrel

- Implemented in the low income slums and squatter settlements of urban areas
- Replicated in high income households of Dhaka city



**Benefits of Using the Barrel**

- Organic waste turns more quickly into organic fertilizer
- Can be used as much as and whenever necessary
- Reduces nuisance of mosquito and flies; therefore checks related diseases.
- No odor is generated and keeps the environment pleasant.
- Provides useful nutrients for the soil
- Easy to use, continuous and sustainable process and does not require additional manpower

**Problems of using the barrel**

- Initial cost though a little bit high, yet recoverable through selling of the compost.
- Can not be produced on large scale

**HOW TO USE COMPOST**

Crop	Application	Method
Rice, wheat, etc.	10-20 kg/deciml	During land preparation
Potato, onion, etc.	20-28 kg/deciml	During land preparation
Vegetables	16-24 kg/deciml	During land preparation
Fruit bearing/ timber trees	1/2-3/4 kg/tree	Twice a year
Seasonal flowers	40 kg/deciml	During land preparation
Tub plants	1/3-1/2 kg/tub	Twice a year

**COMPOST BARREL**

Slum based waste management and composting pilot program: Urban slum and suburb project (GDB and UNICEF)





# Existing Examples of Good Practices

## World's First Compost Project in Dhaka using CDM

**700-tons per day capacity** composting project for Dhaka City Corporation area. This project is expected to produce compost **50,000 tons every year**, creating job for **800 urban poor**, saving municipal waste management cost, improve the environment and reduce **89,259 tons of CO<sub>2</sub>e/ Year**. This Certified Emission Reduction (CER) from composting organic waste has created a new source of revenue for a composting initiative.



# Existing Examples of Good Practices



**Giving Better Working Environment to Informal Sector**

# Existing Examples of Good Practices

## School Composting of American International School Dhaka (AISD)

- **Annually Recycle 32 tons/year** i.e., recycle 81.8% of waste.
- **Compost Produced: 9 tons/yr** worth Tk. 45,000  
Reduce 19 tons of CO<sub>2</sub>e/yr. Green House Gas composting organic vegetable waste.
- **Paper Recycled 13 tons/yr.** worth Tk. 130,000 Reduce 42.12 tons/yr. CO<sub>2</sub> equivalent.
- **Save municipal expenditure** amounting Tk. 64,000.
- **Save landfill area** of 35.2 cum per year.



# Existing Examples of Good Practices

## Use of Biomass in Boiler- Example of a Private Furniture Manufacturer



### Financial Benefits of Using Wastage in the 2.5 Ton Capacity Boiler Instead of Diesel

Name of the fuel	Quantity per year	Rate (Tk)	Total amount per year (Tk)	Saving due to use waste wood Tk./year
Diesel for boiler	1,50,000 (liter)	35 per liter	52,50,000	47,79,079.00
Waste wood/ MDF	3,13,947 (kg)	1.5 per kg	4,70,920.9	

# Existing Examples of Good Practices

## Biomass Used for Commercial Power Generation



Dreams Power Ltd. at Kapsia



Bio-gas generation units; ladder shown used for feeding rice-husks

Industry	Enterprise	Raw Material	Production Capacity	Number of beneficiaries	Number of jobs created
Electricity	<b>Dreams Power Ltd</b> (biomass generated electricity production & distribution) Estd. In 2007	Rice Husk 9 tons/day	300 KW	500 households	22

## Animal Waste Used for Bio Gas Production Link with **GHG Mitigation**

Biogas technology provides an alternative source of energy mainly from organic wastes and livestock waste. It is obtained in the process of biodegradation of organic materials under anaerobic conditions, which allows extraction of energy from organic matter without destroying nutrients contained in it. In Bangladesh so far 60,000 Biogas Plants have been established With funding from IDCOL. The target is 200,000 rural biogas plants

Domestic biogas installations can reduce greenhouse gas (GHG) emission in three different ways:

- Substituting fossil fuels and non-renewable biomass for cooking (smaller extent for lighting) with biogas
- Replacement of chemical fertilizer with the organic fertilizer



## Lessons Learned

- Clear-cut policy package, incentives, guidelines needs to be promoted for 3R in Bangladesh.
- Appropriate Technologies are expensive, which should be subsidized by rich developed countries (for example technology transfer in CDM projects).
- Easy financial support should be promoted by bank/ financial organizations and incentives should be extended to 3R projects.
- Capacity building training programs and research on 3R required for both public and private sector
- Role of Media needs be promoted to inform people and raise mass awareness on 3R.
- Public-Private-Community Partnership needs to be promoted to bring in investment in 3R projects.
- Informal sector should to be given special attention in 3R initiatives.

# STRATEGIS FOR PROMOTION OF 3R

The main features of the National Strategy promoting 3R are:

- ✓ Prioritizing waste avoidance/reduction over recycling, and recycling over all other forms environmentally sound disposal;
- ✓ Reusing non-avoidable waste as far as possible;
- ✓ Maintaining content of hazardous content in the waste at the lowest possible level;
- ✓ Guaranteeing an environmentally sound residual waste treatment and disposal as basic prerequisite for human existence and environmental protection.



## Municipal Waste

- **All households will be encouraged to purchase and use compost bins** available in the market. As part of the strategy, the City Corporations/ Pouroshavas will provide market information; negotiate with the suppliers and arrange for higher purchase systems; and also develop appropriate subsidies for the poorer sections to obtain the bins.
- **The City Corporations/Pourashavas will engage private sector to establish recycling plants for organic waste** such as biogas or composting plant. Moreover for recycling of inorganic waste such as plastic, glass, metal incentive will be provided by the local authorities to recycle the waste as much as possible.
- **For establishment of treatment and recycling facilities, local government bodies will arrange land** and also ensure supply of right quality of waste for private entrepreneurs.
- **All kinds of recycling activities can contribute towards green house gas mitigation**; as such linking recycling projects with Clean Development Mechanisms (CDM) will be encouraged.
- **Domestic waste which can not be recycled will be used for sanitary land filling.** The site for land filling will be selected after EIA and public consultation.

# STRATEGIS FOR PROMOTION OF 3R

## Hazardous Waste from Manufacturing Industry

### • Inventory of hazardous waste generation

Since industries change their products, processes and capacity of production, and new industries get established periodic, updating of inventories is required. It should be made mandatory on the part of industries to report changes/additions in hazardous waste generation and steps taken to reduce generation of waste per unit of production. Industries will be required to store hazardous waste for a period not exceeding 90 days and shall maintain a record of sale, transfer, storage, recycling and reprocessing of such wastes unless agreed by DoE. The waste could either be recycled /reused or disposed of in captive or common Treatment, Storage and Disposed Facilities (TSDF) available in the country, or be incinerated. Inventories of 'end of life' consumer products such as e-waste are also required to be made.

### • Waste avoidance and waste minimization at source

In the hierarchy of waste management, waste avoidance and waste minimization have to be attempted first, for which dissemination of information on technological options should be a continuing exercise. Promote implementation of recovery of resources such as solvents, other reagents and by-products as well as re-generation of spent catalysts in a time frame manner.

### • Reuse, recovery and recycling of hazardous waste

-Industrial associations/industries should explore options/ opportunities of reusing, recovery and recycling of hazardous waste in an environmentally sound manner.

-Establishment of 'Waste Exchange Banks/ Centers' should be encouraged to provide information on wastes and promote reuse, recovery and recycling technologies which upscale the quality of resource recovery.

-Introduce payback scheme as part of extended corporate responsibility in case of lead-acid batteries.

- Develop a system for channel sing of wastes containing toxic metals for recovery, such as mercury from thermometers and fluorescent tube lights, cadmium from batteries etc.

# STRATEGIS FOR PROMOTION OF 3R

- **E-waste**

The recycling of e-waste is required to be regulated due to presence of hazardous constituents in the components of waste electrical and electronic assemblies. Governments should encourage e-waste recycling projects under public-private partnership mode.

- **Encourage cleaner production and eco-design practice**

Encourage cleaner production and eco-design practice within each manufacturing sector: This is a process which minimizes environmental impact across the product life cycle, whilst producing a high quality, cost-effective product

- **Encourage the use of Environmental Product Labeling**

Encourage the use of Environmental Product Labeling on products to enable consumers to make informed choices about the products they buy

- **Encourage the implementation of Environmental Management Systems (EMS),**

Encourage the implementation of Environmental Management Systems (EMS), which can result in better resource efficiency and increased awareness of waste prevention and recycling practices throughout staff, the DoE, will promote the implementation of EMS through the provision of guidance, advice and leading by example

- **Safe disposal of hazardous waste**

For the waste which cannot be recycled/ reused, safe and environmentally sound disposal should be adopted depending upon waste category. Design and operation norms of disposal facilities should be strictly adhered to as per the guidelines to be framed by DoE. Supervision of such facilities by DoE during construction stage is required to ensure quality of construction as per guidelines, including post closure monitoring.

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## Hazardous Waste from Manufacturing Industry

### •Setting up of Common Treatment, Storage and Disposal Facilities (TSDFs)

Setting-up of TSDFs should be considered within industrial estates/ EPZs. The Government may consider providing financial support for establishing such treatment facilities. The TSDFs shall cater to meticulously delineated hazardous waste catchments areas taking into consideration their distance from the generators and availability of wastes. DoE shall ensure that in a given hazardous waste catchments area, there are no multiple operating TSDFs. Private sector will be encouraged to establish TSDFs.

### •Transportation of hazardous waste

DoE will develop on-line tracking system for movement of hazardous waste from generation to the disposal/ recovery/ recycle stage. Industries have to pay for collection and transportation of waste for treatment and disposal out side the industries own premises,

### •Use of cement kilns for hazardous waste incineration

Use of hazardous wastes (such as ETP sludge from dyes & dye intermediates, tyre chips, paint sludge, Toluene-Die-Isocynate tar residue and refinery sludge) as supplementary fuels in cement kilns need to be promoted.

### •Illegal dump sites and remediation

To take care of illegal dumping, surveillance both by enforcement agencies and industry associations needs to be stepped up. The approach for site remediation of dump sites would vary from site to site depending on nature of pollutants, future damage potential and remedial cost. The remediation strategy should focus on the 'Polluter Pays Principle' which needs to be strictly enforced. In such a case, the polluter has to reinstate or restore the damaged or destroyed elements of the environment at his cost. To take care of cases of remediation wherein polluters are not traceable, a dedicated fund needs to be created by MoEF.

## Hazardous Waste from Manufacturing Industry

### •Strengthening the infrastructure of regulatory bodies

-For effective enforcement of regulations, DoE has to be strengthened in terms of manpower, equipment, instruments and other infrastructure facilities. The Government may support DoE by adequate funding, training and awareness programmes, periodically.

### •Disposal of date expired drugs & pesticides:

- In order to deal with such hazardous wastes, as well as disposal in a facility as per following options should be permitted:
- To have these processed wherever possible by the industry.
- To appropriately incinerate either through dedicated incinerators of individual industry or through incinerators available with common facilities.

### •Handling and management of hazardous waste during ship dismantling:

- Adequate safety systems and procedures need to be adopted during dismantling of ships and handling of hazardous wastes/ materials (such as used oil, waste oil, asbestos containing panels/ tiles, damaged asbestos containing material, paint chips, and used chemicals like acids etc.) This activity is required to be regulated through DoE and Shipping Department.

## Hazardous Waste from Manufacturing Industry

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## Waste from Agriculture

- Recycling of pesticide waste is not viable due to product quality requirements and the environmental risks involved. However, government will promote technologies such as efficient stoves to minimize the use of agricultural waste as domestic fuel source and encourage surplus biomass for production compost or energy.

## Medical Waste

- Recycling of medical waste is not viable due to the potential health risks. Capacity building and waste management education programmes need to be implemented before medical waste can be managed in an environmentally sound manner.

# ROLE OF RELEVANT **STAKEHOLDERS**

Implementation of the 3R strategy will involve active participation by major stakeholders in stakeholders. Their respective roles include:

## **Government**

Develop policies, guidelines and rules and regulations,

- Facilitate local authorities as well as industries to provide infrastructure facilities;
- Arrange required financial mechanisms to implement the strategy, and
- Accommodate the role of informal sector in the strategy.

## **Citizens and Industrialists**

- Sorting of waste at household as well as factory/commercial and institutional level to:
- Reduce
- Reuse
- Recycle and
- Environmentally Sound Final disposal

## **Private Sector**

- Involvement in recycling activities
- Investment in 3R related projects
- Participate in the development of infrastructure facilities in collection, transportation and recycling of waste
- Provide 3R related infrastructure at industry level
- General awareness creation



# ROLE OF RELEVANT **STAKEHOLDERS**

## **NGOs**

- Community mobilization in the implementation of the strategy
- Awareness creation to secure community participation

## **Informal Sector**

- Play supportive role to promote separation and collection of waste at primary level.
- Use practical experience and local knowledge to improve waste management and recycling system.
- Work in partnership with community, government, NGOs, CBOs and private sector.
- Improve the working conditions to reduce health hazards.

## **Small and Medium Enterprises (SMEs)**

- SMEs using recyclables as raw material work closely with informal sector and create demand for fresh recyclables in the market;
- Produce environment friendly products;
- Adopt cleaner technology and improve the health and safety for its workers; and
- Attract investment and appropriate technology to recycle more waste and produce new products for a sustainable business.

## **Media**

- Coverage of 3R activities.
- Mass awareness raising campaigns.
- Publicity of good example of 3R practices.

## **Scientific/ Research Bodies/Education Institutes/Training Centers**

- Carry out research and pilot innovative solutions
- Provide knowledge and information on 3R related appropriate technologies
- Provide capacity building hands on training

# Creation of Climate Change Trust Fund

- USD\$100 million for the financial year 2009-10
- USD\$100 million for the financial year 2010-11
- 3R pilot projects undertaken for Dhaka and Chittagong City and ten districts from the trust fund.

**THANK YOU**