

Fourth Regional 3R Forum in Asia

“3Rs in the Context of Rio+20 Outcomes – The Future We Want”

Ha Noi, Viet Nam, 18-20 March 2013

Country Analysis Paper

(Draft)

< Bangladesh >

Bangladesh Country Report Part one; by MoEF-Bangladesh

This country analysis paper was prepared by Bangladesh as an input for the Fourth Regional 3R Forum in Asia. The views expressed herein do not necessarily reflect the views of the United Nations.

Bangladesh initiatives towards 3R approaches: A Country Analysis Paper

1.0 Bangladesh: Country Perspective

Bangladesh, a country that lies on the flank of Himalayas and stretches its alluvial edge towards the coral isles of the Bay of Bengal, finds herself in the same milieu as its neighbours in the Asia-Pacific region. The country faces a demographic challenge that drags her into a state of sprawling urbanisation, expansive industrialisation and escalating consumption. The result is: a galloping increase in waste generation and resultant disruption of environment by fouling of air, water, and soil by incessant flow of wastes. Aside from various municipal, institutional, industrial and agricultural wastes (e.g., agricultural residues, fertilisers, other materials, etc.), new streams of waste from a wide spectrum of sources, including electronic waste, health-care waste, construction and demolition debris, harmful household wastes, assorted street sweepings, and a surge of polythene and plastics in coastal-marine-aquatic habitats, emerge as a serious concern. Considering the adverse effect of these wastes on human health, habitat, ecosystems, and sustainability of development endeavours, the government preferred a path to **reduce** generation of waste, to **reuse** the used products or waste with simple treatments, and to **recycle** the used product or waste by using it as resources to produce the same or other products. In other words, the government embraced a **3R policy**, which aims at achieving resource efficiency throughout the economy, covering a wide array of its key sectors, including agriculture, industry, energy, civic amenities and individual households. ***The policy focuses on new public values of efficiency, economy and effectiveness, as well as equity and justice, and articulates the state philosophy of environmental governance.***

This brief country report, prepared by the Department of Environment (DoE), Ministry of Environment and Forests (MoEF), Government of the People's Republic of Bangladesh, provides a frame of reference to reckon the government's current initiatives towards **3R approaches**, their reflection in national development plans and strategies, and in schemes of ongoing national and local actions. This paper is intended to present a basis for policy consultations and panel discussions at the country roundtable of this 4th regional 3R congregation, which will ultimately pave the way for collaborative actions towards agreed goals and targets for *the "Future We Want" for ourselves.*

2.0 Waste Scenario in Bangladesh

Although waste can be considered as "unrecovered wealth," it remains a concern in Bangladesh. Bangladesh being the ninth most populous country and the twelfth most densely populated country in the world, projects an urban population growth rate of 3% from 2010 – 2015 (UNdata, 2012). Unplanned urbanization, coupled with an acute density of population, provoke a plethora of industrial and commercial activities and thus accelerate the pace of economic growth that contribute to excessive amount of waste in Bangladesh. Rapid change in consumption and production patterns and a reorientation in our lifestyle determine the course of waste generation.

The rate of population growth intensely aggravates the problem of waste management in the larger cities. An UNFPA report reveals Dhaka as one of the grimmest cities of the world particularly because of its conventional management of municipal waste. Huge amounts of waste that remains uncollected on the capital's streets every day due to absence of proper waste management, expose the city dwellers to greater environmental hazards and health risks. Heaps of uncollected waste dumped into the rivers and low lying areas or left on the roadsides, not only block the city's drainage links but also create an unhealthy and stinking environment.

Most of the hazardous medical waste from the city's hospitals and clinics remains uncollected and gets mixed up with the household waste. Stacks of assorted waste, putrefied in the open, can spread various harmful diseases like hepatitis, HIV, dysentery, diarrhea, malaria, scabies, and skin ailments. The dumping sites also create a toxic liquid substance called leach, which can trigger pollution even at the underground water level.

Table 1 in the next page illustrates the current and future waste generation scenario in Bangladesh.

**Table 1:
Wastes Generation Scenario in Bangladesh**

Category	Statistics	Data Source
TOTAL VOLUME OF WASTES (tons/year)		
Total volume of municipal solid wastes in urban areas	4,866,505 (2005) = 13,332.89tons/day x 365 3,000 tons/day in Dhaka (2005)	Waste Concern (2005) JICA (2005)
Agricultural Waste	65 million metric ton per year	Waste Concern and Swiss Contact (2005)
Industrial waste (hazardous) from seven selected sectors	109.47 million/cubic meter/year (waste water) 0.113 million ton/year (sludge) and 26, 884 tons/year (solid waste) from textile, hospital clinics, tannery, pesticides, fertilizer, oil refinery as well as paper and pulp industries	Waste Concern and ADB (2008)
Hazardous Medical Waste	12,271 metric ton per year (2007)	Waste Concern and ADB (2008)
WASTE PER CAPITA (kg/per/day)		
	Urban: 0.41 (2005); Dhaka City: 0.56 (2005) Agricultural:1.68 (based on 2008 rural population)	Waste Concern (2008) JICA (2005)
FUTURE WASTE PROJECTIONS (Total Waste Generation)		
By 2025 (solid waste) 2012 (hazardous waste)	17,155,000 tons/year = 47,000tons/day x 365 0.60 kg/per/day in Urban Areas 2472.07 million/cubic meter/year (waste water), 2.81 million metric ton/year (sludge) and 53,874 metric ton/year (solid waste)	UMP (1999), as cited by Waste Concern (2008) Waste Concern and ADB (2008)
SOLID WASTE MANAGEMENT		
Collection of waste (% of waste generated)	44.30% - 76.47% in major urban cities 43.5% for Dhaka City	Waste Concern (2005) JICA (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 prevails).	JICA (2005)
E-WASTES		
Use of electronic goods in year 2006	Mobile phones: 22,000,000; Personal computers: 600,000; Televisions: 1,252,000	Waste Concern (2008)
RECYCLE		
Informal Sector	120,000 urban poor from the informal sector are involved in the recycling trade chain of Dhaka City.15% of the total waste generated in Dhaka (mainly inorganic) amounting to 475 tons/day are recycled daily.	Waste Concern (2005)

Source: *National 3R Strategy for Waste Management* (Dhaka: DOE, 2010)

3.0. Bangladesh initiatives towards 3R approaches

3.1. Major initiatives and achievements in the areas of 3R policies, programmes, and institutional measures

3.1.1. *National 3R Strategy for Waste Management:*

Bangladesh adopted its first ever *National 3R Strategy for Waste Management* in 2010. The Department of Environment under the Ministry of Environment and Forests developed the strategy with support from UNCRD (United Nations Centre for Regional development) and the Ministry of Environment of the Government of Japan. The strategy was formulated through an inclusive process, by holding a series of workshops over a

period of two years with participation from a wide array of stakeholders, including governmental agencies, city corporations and municipalities, industries, universities, research institutes, think tanks, non-governmental organisations, people's organisations, collective bargaining agents, various private entities and community leaders.

The strategy articulates the framework of the government's 3R policy and aims at prevention of excessive use of resources, minimisation of wastes, recurrence of use, reprocessing of waste for repeated use or recycling, (energy) recovery and eventual disposal of wastes through a cycle of transformation, retention and recirculation of resources. The most crucial object of the strategy is to help prevent disposal of waste in environmentally sensitive areas such as rivers, wetlands, and low-lying areas and reduce the adverse impact of climate change. The strategy addresses the key issues and challenges in disseminating 3R practices in the country, defines the role of various actors (government, private sector/industries, SMEs, think tanks, research institutes, informal sectors and the media) and provides guiding principles for facilitating the implementation of 3Rs in the country. The guiding principles incorporated in the strategy include: separation at the source, selection of appropriate/affordable technology, adoption of emission-reducing technology, cleaner production, product-life extension, technology bans, industrial symbiosis and by-product exchange, polluter pay principle and take-back provisions, green purchasing, Environmental Management Systems (EMS), public-private partnership (PPP), support to informal sector, etc. The strategy identifies the following sectors as the priority sectors for 3R interventions: municipal solid waste, industrial waste, biomedical waste, institutional waste, commercial waste and agricultural waste. The strategy recommends a set of good practices and lessons in order to achieve higher levels of waste reduction, reuse, and recycling and minimising waste disposal on open dumps, rivers, flood plains and landfills by 2015.

The National 3R Strategy for Waste Management sets the following as the tenet of its tactical approach: Prioritizing waste avoidance/reduction over recycling and recycling over all other forms environmentally sound disposal; Reusing non-avoidable waste as far as possible; Promoting environment friendly raw materials; Maintaining content of hazardous content in the waste at the lowest possible level; and Guaranteeing an environmentally sound residual waste treatment and disposal as basic prerequisite for human existence, environmental conservation and protect bio-diversity. Among other things, the elements of the strategy include: Raising public awareness through information, education and demonstration projects; Engaging an affordable mix of appropriate technical options to reduce, reuse, recycle waste; Establishment of National 3R Focal Point and strengthening of the infrastructure of the regulatory bodies; Involving relevant stakeholders, Adoption of appropriate and affordable technological options; Partnership with NGOs, Civil Societies and the Private Sector. The Strategy also focuses on a cluster of pertinent issues: the regulatory framework for the 3R practices; capacity building of the 3R Secretariat; Research and Development (R&D); Public, Private and Donor Funding; Cost Recovery Mechanism; and sector-specific strategies. Moreover, the strategy also addresses a set of other issues important for the diffusion of 3R practices: Handling of hazardous wastes, Occupation safety and health management, and Surveillance against illegal dumping. The strategy finally adopts an action plan for the implementation of the strategy itself.

3.1.2. Implementation of 3R Initiative (Pilot) Project:

Keeping in view the global commitment to reduce green house gases as decided in Bali at COP 13 in 2007, the Government of Bangladesh adopted *Bangladesh Climate Change Strategy and Action Plan* in 2009 and established a trust fund to ensure its implementation. The Government undertook a pilot project titled "Implementation of 3R Initiative (Pilot) Project" in April 2010 under the Climate Trust Fund in order to pilot and demonstrate 3R initiatives in the selected neighbourhoods of Dhaka and Chittagong cities. This project aims at promoting the concepts and practices of 3Rs in order to raise public awareness about the benefits of source segregation of wastes and recycling. The project is particularly intended to reduce the amount of waste in landfill sites, build public, private and community partnerships in waste management and recycling initiatives, create jobs for neglected urban poor, capacity building and training for stakeholders linked with the management and recycling of wastes, integrate the existing recycling and composting trade chain with the project, influence relevant policies to give incentives to producers, consumers and recycling industries who practice the concept of 3Rs and reduce emissions of Green House Gas from landfills. The project components include: distribution of 1,80,000 waste bins among 60,000 families in Dhaka and Chittagong; provision of Rickshaw vans for house to house waste collection, construction of mini Transfer Stations, collection of vehicle-mounted vacuum cleaners, and construction of three demonstration plants for composting at three

different sites in the cities of Dhaka and Chittagong. Implementation of the project is in progress and is expected to be completed by March 2014.

3.1.3 Other projects/initiatives

To promote proper waste management and recycling activity all over the country, using the Climate Trust Fund in 2012, the Government initiated another project entitled, 'Programmatic CDM Project Using Municipal Organic Waste of Towns (City Corporations/Municipalities) in Bangladesh' using programmatic approach of Clean Development Mechanism (CDM). During 2010, the Department of Public Health Engineering (DPHE) of the government in partnership with UNICEF initiated the preparation of Action Plan for solid waste management in 19 towns of Bangladesh based on 3R principle and carbon financing. In 2010, The Daily Star, a national daily and HSBC Bank jointly launched a national award titled "HSBC-The Daily Star Climate Awards" with the objective of encouraging local individuals and institutions working to face the challenges of climate change in Bangladesh.

3.1.4. Institutional Measures

As a well organized institutional set-up is a *sine qua non* for implementation of 3R and its sustainability, the Environment Wing of the Ministry of Environment and Forests has reorganised its functions to act as the 3R Focal Point in order to guide the promotion and implementation of 3R strategies in the country. Aside from the 3R Focal Point, an inter-ministerial committee is being formed for coordination among different line ministries. Moreover, a 3R Cell has been constituted within the Department of Environment to monitor progress in the implementation of 3R strategies and also for multi-level communication. The Cell will operate through a decentralized network of nation-building institutions and pursue a well defined frame of actions as envisaged in the *National 3R Strategy for Waste Management*.

3.2. Major initiatives and achievements in promoting 3R technologies and infrastructure development

The country's National 3R Strategy for Waste Management envisages development and transfer of environmentally sound technologies for waste management that would be applicable in the context of the prevailing socio-economic and climatic condition of the country. The strategy seeks to chart a course of collaborative actions between and among relevant stakeholders such as the national government, local governments, private sectors (including inter-industrial collaboration), consumers, manufactures, informal sectors and research bodies. The strategy gives special attention to waste intensive industries.

Bangladesh presents numerous examples of community-based initiatives in adopting appropriate and affordable technology. Waste Concern, a private entity in Bangladesh, transformed a small-scale composting activity into a larger scale initiative, using Clean Development Mechanism (CDM). Besides, Bangladesh saves minimum of US Dollar 4.73 million by recovering lead from used lead acid battery by recovering 3242 tons of recycled lead per year. However, although 51% of total plastic waste is recycled in Dhaka city, related health safety and environmental issues need an urgent attention.

3.3. Examples of specific policy initiatives or measures in dealing with new emerging waste streams such as - e-waste, plastics in coastal-marine environment, chemicals and hazardous wastes

Bangladesh's National 3R Strategy for Waste Management clearly mentions that emerging new waste streams such as electronic waste, plastics in the marine environment, oil and lubricants would require special international and national action aiming at a high rate of recovery worldwide, and these streams should also be addressed through appropriate programs and environmentally sound technologies, particularly to promote material and energy recovery. The strategy also recognises the need to build local capacity in the developing countries to address the flow of e-wastes. Particularly the strategy invites attention to the shipment of e-waste to developing countries, requiring electronic companies to take full responsibility for the safe recycling of their products.

3.4 Specific policy initiatives or strategies for promotion of 3Rs in industries, business sectors, SMEs, agriculture and rural sectors

Bangladesh has adopted the following policy/ regulatory regime that attune to 3R principles and practices:

**Table 2:
Policy and regulatory measures coherent with 3R principles and practices**

Sl.	Policy/Act/Rules enacted	Waste management Issues included
1	National Environmental policy 1992	Provides regulation for all activities that pollute and damage the environment
2	National Policy for Safe Water Supply and Sanitation, 1998	According to this policy the government would take measures towards increasing the coverage of safe drinking water, ensuring the installation of one sanitary latrine in each household in the rural areas and improving public health standard.
3	National Renewable Energy Policy- 2008	This policy seeks to promote production of biogas and other green energy from waste and also providing incentives for development of CDM to promote green energy projects
4	National Agriculture Policy-1999	According to this policy, the government will promote the use of compost/organic fertilizer amongst the farmers to improve the soil productivity and food security
5	Urban Management Policy Statement- 1998	Engage municipalities in privatization of services, give priority to facilities for slum dwellers including provisions of water supply, sanitation and solid waste disposal.
6	Bangladesh Environment Conservation Act (ECA)-1995	Recommends standards for disposal of different types of waste
7	Lead Acid Battery Recycling and Management Rules, 2006	Improved collection and recycling of used lead acid battery
8	Medical Waste (Management and Processing) Rules, 2008	Source separation of hospital waste as well as transportation, treatment and disposal of all kinds of hospital and clinical waste made mandatory
9	Hazardous Waste and Ship Breaking Management Rules 2011	Provides detailed regulation on environment-friendly ship-breaking and hazardous waste management
10	Electronic Waste Rules, 2012 (Draft)	Provides for the management and handling of electrical and electronic waste
11	Solid waste Management Rules-2012 (draft)	3R principle has been emphasized.
12	Hazardous Waste Management Policy of Bangladesh 2009 (Draft)	Intended to set regulatory standards for hazardous waste management
13	Anti-odour Rules 2012 (Draft)	The draft rules seek to regulate and control bad odours.

Source: DoE, 2012

4.0 Conclusion: The Way Ahead

Bangladesh has embraced the 3R philosophy and has embarked on the process of implementation of the 3R Strategy. The Government needs to form an inter-ministerial committee to monitor the process and ensure proper implementation of strategy. A revised action plan should be adopted to guide the process. Raising public awareness through information, education and demonstration projects should be given priority. The Government may replicate the pilot initiative undertaken in Dhaka and Chittagong throughout the country. Government may also consider offering of fiscal and economic incentive for 3R related initiatives and promote public private partnership in the sector. Capacity building should be the key to sustained efforts in different sub-sectors of 3R. Among other things, 3R technology development should receive due importance, particularly in terms of social acceptance and economic feasibility. R & D on 3R technology should also be given adequate attention, in order to avoid its hazardous impacts. In this connection, a national 3R resource management center should be established to promote and support 3R related initiatives and businesses. Bangladesh, being a nation most vulnerable to climate change has no other alternative but to join its neighbours in the region in quest of a resource efficient society and a green economy.

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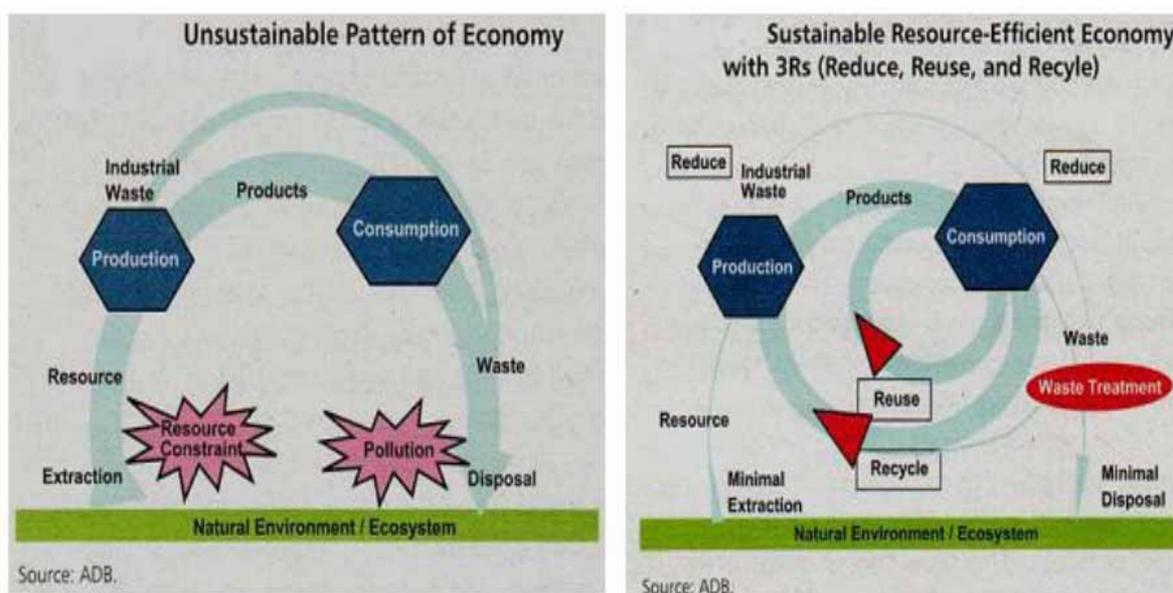
Bangladesh Country Report Part two; by Ministry of Local Government, Rural Development & Cooperative-Bangladesh

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1.0 Introduction

Rising waste volumes and increasing complexity of waste streams have become major and growing public health and environmental problems. Due to the growth of population and the changing lifestyles and consumption patterns of people; not only the quantity of waste generation is increasing, the quality and composition of waste is also changing particularly more and more hazardous and toxic waste are adding into the waste stream. To address the problem, waste has to be collected separately and more specific treatment is needed. This needs the mobilization of resources such as human, equipment and finance. It has to be viewed not only as a problem but also as an opportunity. There should be a paradigm shift in thinking about waste 'not merely as a nuisance but as a resource' and the shift of waste management 'from contain and disposal to resource management'.

In recent days, the 3Rs principle has started gaining more attention due to the depletion of natural resources and increase of pollution level in the environment. 3Rs is an approach that can promote the efficient use of resources, harmonizing both environmental and economic concerns through making efforts on waste reduction, reuse and recycling. Figure 1 and Figure 2 describes the changes in the flow of resources in the production to consumption and final disposal through both unsustainable pattern of economy and sustainable resource-efficient economy with 3Rs. The first diagram shows a 'one way' economy in which resource extraction, production, consumption and final disposal are open ended with little effort in resource-savings making environment at risk. The second diagram is a shift of End of Pipe to 3R a 'closed loop' of resource management in the production-consumption-disposal cycle with maximum utilization of resources and minimal waste production by reusing and recycling of by-products.



2.0: Background of 3R initiative

The importance of 3R is emphasized in many global agendas and action plans. Agenda 21 highlights to change consumption and production patterns for sustainable development. The Johannesburg Plan of Implementation (JPOI) adopted at the 2002 World Summit on Sustainable Development stipulated that all

countries should promote sustainable consumption and production to facilitate global sustainable development. It has laid emphasis on developing waste management systems, with the highest priority placed on waste prevention and minimization, reuse and recycling and environmentally sound disposal facilities. The thirtieth G8 Summit at Sea Island Georgia, US (June 2004) and the follow-up 3R Ministerial Meeting in Tokyo (April 2005) have directly or indirectly emphasized the critical need for reorienting production and consumption patterns through the effective implementation of 3R principles.

At the G8 summit, G8 countries agreed to launch the 3R Initiative in 2004 with the objectives of reducing barriers to the international flow of goods and materials for recycling and remanufacturing and building capacity for the 3Rs in the developing countries. The 3R Initiative towards a 'Sound Material Cycle Society' was formally launched at the 3R Ministerial meeting in Tokyo. Since the late 1990s, the People's Republic of China has been adopting 'Circular Economy Policy' with a shift of its strategies for environmental management from the end-of-pipe approach to integrated life cycle management. Activities of the 3R Initiative in Asia included a series of inter-governmental meetings and expert meeting with an outcome of adopting 'The Kobe action Plan'. The Kobe action plan has given emphasis to prioritize the 3Rs in the national development strategy. In 2009, the National 3R strategy Development Project has been implemented as a collaborative capacity development programme in six Asian countries including Bangladesh with the support of Ministry of Environment of Japan and United Nations Centre for Regional Development (UNCRD).

3.0 Review of the National 3R (Reduce, Reuse and Recycling) strategy for waste management

Department of Environment has formulated the National 3R (Reduce, Reuse and Recycle) strategy for Bangladesh having a series of national consultation meetings with the concern ministries and other potential stakeholders. The strategy has been introduced with an intention to meet the challenges related with the continuous increase in waste generation and resource demand, intends to raise the priority of environmentally sound waste management and resource efficiency as well as increase institutional capacity. This strategy has been ratified by the Government of Bangladesh (GOB) in 2010. The strategy sets the goal of waste reduction, reuse and recycling and minimizing waste disposal in open dumps, rivers, flood plains and landfills by 2015 and promotes recycling of waste through mandatory segregation of waste at source as well as creates a market for recycled products and provides incentives for recycling of wastes.

- It recognizes waste as a resource and advocates for segregation of waste at source.
- The strategy encourages emission reducing technology and tapping the potential of CDM provisions.
- It encourages the private sector investment
- It promotes "polluters pay" principle as well as cleaner production and Environmental Management System (EMS).
- It supports the participation of the informal sectors who are engaged in the recycling of various materials.
- To promote 3R principles, the strategy recommends:
 - Raising public awareness,
 - Employing appropriate technology,
 - Setting up a 3R secretariat at Department of Environment (DoE)
 - Involving all stakeholder groups through Public-Private Partnership (PPP)
 - Funding through Clean Development Mechanism (CDM)
 - Segregation of waste at source and special treatment for hazardous waste.

It also defines the roles of government agencies, citizens, private sector agencies, NGOs and Media. The National 3R strategy directs the local government authorities to develop their own action plans with setting up of quantifiable targets and pursue organic waste recycling through composting, bio-gas and refused derived fuel.

4.0 Existing situation of recycling in Bangladesh

The process of recycling in Bangladesh is very much in practice informally without control of any statutory body. Recycling provides jobs for waste pickers, business for traders and commercial activities for the owners of certain mills and factories who use wastes as raw materials for producing saleable items. In many cases the recycling saves foreign exchange from importing the things that can be produced locally from wastes.

Recycling is mainly done through unorganized sector, an informal network of waste pickers (both from primary disposal points as well as intermediate/final disposal areas), door-to-door collectors, primary and secondary dealers, and finally the recycling industries. Recyclables (plastic, metal, glass, paper etc.) are mainly recycled informally by small and medium sized industries using local and inefficient technologies in an unhealthy working condition. They lack of modern affordable technology, knowhow, incentives and proper infrastructures. Solid waste management, poverty and recycling are closely linked. Recycling is mainly economics driven as it is a source of livelihood for many unemployed both man and woman. Significant number of women and children are involved in waste picking.

In Bangladesh, recovery and recycling occurs in three phases. In the first phase, the waste generators separate waste which has higher market value such as newspaper, bottles, and plastic containers and sell them to street hawkers. In the second phase, the scavengers are rummage through the wastes near the bins for collecting recyclable materials of low market value such as broken glass, cans, polythene which are discarded by households. The final phase is the collection of recyclable materials by the waste pickers from the waste vehicles immediately after unloading at dumpsites. Scavenging from an economic and social point of view, it economizes on resource use, reduces burden of waste disposal and contributes to environmental conservation. However, they work in wastes in a risky environment without due consideration to their occupational health and safety.

5.0 Source segregation and 3R project in Bangladesh

There is virtually no organized and planned source segregation in any part of Bangladesh. Segregation, if at all, is driven by economic factors except for healthcare waste in a limited scale due to regulatory requirements. Sorting is mostly done by unorganized sector (scavengers and rag pickers) and rarely done by waste generators. The efficiency of segregation is quite low as the unorganized sector tends to segregate only those waste materials which have relatively higher economic return in the recycling market. This segregation and sorting takes place in a very unsafe and hazardous condition. Despite the absence of organized segregation system, quite substantial amount of plastic, metal, paper, glass etc. are collected and recycled. A large number of people ranging from rag pickers to primary dealers, secondary dealers and recycling industries earn their living out of waste recycling.

In contrast, organic waste, which constitutes the largest portion in the waste stream, is often disposed of rather than being segregated and converted into compost, bio-gas etc. Composting is done by the private sectors from waste segregated at the plant. As no national targets have been set up to promote waste minimization, recycling and recovery, the city corporations or municipalities have taken initiative for waste reduction through composting. However, demand and marketability of compost is found a big problem which forced to shut down of some of the composting plants.

Availability of funds to support waste segregation and recycling is a challenging issue. Municipalities are barely able to maintain the basic waste collection and disposal services, heavily subsidized by the government.

Pilot and demonstration projects could play a significant role in complementing the national 3R strategies and policies by motivating the general public, the private sector, and the other key stakeholders on the beneficial aspects and impacts of the 3Rs.

3R pilot project in Bangladesh

Ministry of Environment and Forest (MOEF) using the Climate Change Trust Fund initiated a demonstration project of 3R (First phase) in 4 communities in Dhaka and 2 communities in Chittagong. The main purpose of the project is to create awareness on source segregation and recycling of waste and reduction of emission of Green House Gases from waste. To address 100 tons of waste of 50,000 families, 70 thousand bins of three different color (Green= Organic, Yellow= Recyclable inorganic and Red= Hazardous) for Dhaka and 50 thousand for Chittagong has been distributed. 180 tricycle vans for Dhaka and 100 for Chittagong with three separate compartments have been made to collect three types

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of waste. For recycling of waste, in Dhaka a compost plant of 15 ton capacity and in Chittagong 10 ton capacity has been designed.



Fig 3: Source-segregation in three colored bins



Fig 4: Three Chambered Waste Collection vans for separate collection

Under the project of Japan International Cooperation agency around 100 families have been piloted in Dhaka. Where levels of understanding and participation have been monitored for several months however, it was found that unless continues monitoring and education is not established it is tough to ensure since there is no policy bindings rather than strategy papers. Dhaka North and South Corporation from 2005 started environmental education program in the schools. There are several models have been developed such as mobile school program, model school program and recycle bank programs. All the efforts are made to promote separation at source and understating waste management and roles of parents and citizens.

6.0 Development of Action Plan for 3R

The development of action plan for 3R is essential for effective waste management. This action plan is the road map for the municipalities for sustainable waste management. The National 3R strategy directs the relevant institutions e.g. local government bodies, industries, NGOs, trade bodies such as Chamber of Commerce and Industries to develop their own action plans for achieving National 3R goal in their respective areas. The key issues that are considered for the formulation of Action Plan:

1. Identification of priority subsectors for 3R in waste sector
2. Setting up of quantifiable targets
3. Setting up time line
4. Mobilization of fund to realize the 3R activities
5. Review and updating of targets
6. Assessment and achievements of the actions

6.1 Objectives of the action plan

To develop a network of stakeholders such as national, local governments, academia, scientific and research community, the private sector, media community, NGOs and the informal sectors for gradual implementation of the components of 3R strategies

- Promote awareness among the general public including school children on the beneficial aspects of the 3Rs
- Gradual implementation of the 3R activities such as source segregation, waste reduction and recycling activities
- To put 3R into practice and creating a recycling oriented society
- To address the issues of sustainable production, consumption and waste minimization through 3R approach

6.2 Key issues of developing action plan

6.2.1: **Role of relevant stakeholders:** Individual, households, community/neighborhood (clubs), Policy makers (ward councilors/officials), business community (SMEs, manufacturers), informal sectors (Waste pickers, secondary buyers), private sector, CBOs/NGOs, research and academic organizations etc. are the potential stakeholders for developing and implementing 3R action plan.

Stakeholders	Roles and Responsibilities
Ministry of Environment	In order to promote and institutionalize effective 3R strategies/policies Ministry of Environment must provide an appropriate political and economic platform in line with the needs and demands of the local community, businesses and the private sector. Develop policies and guidelines with an objective to reducing waste production, reusing materials, and recycling waste for sustainable waste management. Act as 3R Focal point to guide the promotion and implementation of 3R strategies.
Local government authorities (City Corporations/ Municipalities)	The local government authorities could implement the national 3R strategies by initiating a range of projects and activities in collaboration with international partners and donors. Arrange required infrastructure facilities/ finances to implement the strategy. Take initiative for the market of recyclable products Accommodate the informal sector in 3R activities
Donor communities	Bi-lateral/multi-lateral donors can provide both financial and technical resources to promote 3Rs by supporting a wide range of 3R related projects (Pilot/demonstration)
NGOs	NGOs can play an effective role in implementing 3R projects and can also act as advocates for the 3R promotion (awareness creation to secure community participation, community mobilization in the implementation of the strategy) Bridge the ground-based activities such as behavioral change in source segregation, develop green purchasing habits etc.
Private sector	Involvement in recycling activities Investment in 3R related projects Promotion of 3R through CSR
Local Communities	The consent and participation of the local community is essential. Do source-segregation at household Co-operate municipalities to carry our 3R activities
Informal sector	Play supportive role to promote separation and collection of waste at primary level Work in partnership with private sector, NGOs to promote 3R Improve their working condition to reduce health hazards Form co-operatives and establish rights to get justified price Help to phase out children as waste pickers
Small and Medium Enterprises (SMEs)	SMEs using recyclables as raw materials work closely with informal sector and create demand for recyclable materials Adopt cleaner technology and produce environment friendly products Improve health and safety of the workers
Media	Coverage in print and electronic media of 3R activities Organize mass awareness raising campaign Publicity of good practices of 3R

<p>Scientific, research and academic institutions</p>	<p>Research institutions both scientific and academic could conduct research programmes to develop and transfer environmentally sound technologies for the 3Rs. They could play the leading role in introducing and disseminating cleaner production technologies to industries, governments and communities through training , education programmes and other extension and outreach programmes.</p>
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6.2.2 Awareness, understanding and involvement of 3R in society: Raising awareness of citizens is essential factor to introduce source separation and reduce amount of waste. Proper introduction of source segregation and 3R cannot be realized without citizen’s support. Tools for behavioral change in source segregation of waste (Leaflets, stickers, electronic and print media support, billboards etc.), Promotion of 3R activities (TV commercial on SS, 3R songs), Environmental Education on 3R at school (Waste Bank), PR goods (Cap/T-shirt), 3R fair (Waste Market), Logo/branding etc. can be adopted.

6.2.3 3R Socialization: Partnership building between stakeholders

3R is essentially multi-sectoral. Local Government, Environment, health, education, information, agriculture and other relevant ministries or agencies should work together for the promotion and implementation of 3R activities. NGOs, private sector and social organizations etc. should facilitate to bridging the work with the communities. According to 3R strategy, a 3R wing under the Ministry of Environment with subsequent Inter-ministerial committee, Technology Advisory Group and 3R secretariat has been established to guide the promotion and implementation of 3R strategy. However, to bring the 3R activities into practice in society, there should be participation from all actors and participation which could be ensured through formation of three 3R groups such as 3R promoters (official stakeholder network), 3R supporters (community based volunteer network) and 3R volunteers (young generation volunteer network). In addition, there should be establishment of 3R units in the City Corporations who will promote and implement 3R activities. Mass media (Newspaper, Electronic media) should be joining on a regular basis for promoting the 3R activities. A combined 3R networks involving all stakeholders has been proposed in Figure 5.

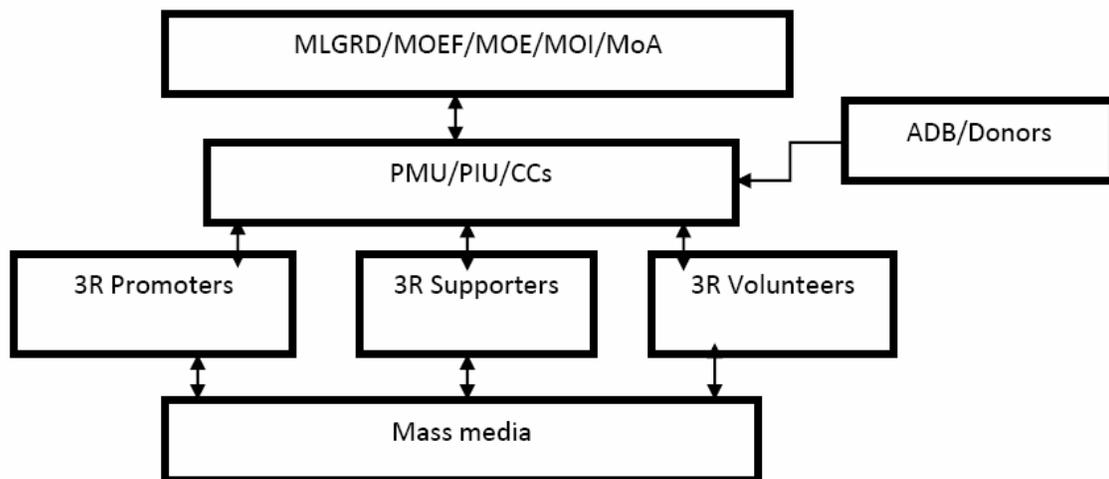


Fig 5: 3R Networks between stakeholders

[3R Promoters: Government Organizations, University and research institutions, private companies etc.
3R Supporters: Community groups, self-motivated citizen, women club, youth club etc. 3R Volunteers:
Students etc.]

7.0 Components of 3R Action Plan

A Detailed Action plan has been prepared for each City Corporation based on the following guiding components:

Target setting:

- Waste segregation at source: At least 1000 Households each year
- Waste to be recycled by composting or bio-gas at least 20 % by 2013 on an incremental basis based on capacity.
- Waste to be disposed of at final disposal site is reduced at least 20% by 2013 on an incremental basis based on capacity.

Targeted activities:

- Identifying pilot wards
- Distribution household garbage bins and collection vans (organic and inorganic)
- Produce source-separation instruction tools
- Environmental education and public relation activities
- Implementation of source separation
- Development of Material Recovery Facility (MRF)
- Construction of compost plant
- Compost production and sell

Time line:

- Short-term (Year 2013-2015)
- Mid-term (2016-2018)
- Long-term (2019-2021)
- Budget:
- City Corporations, Municipalities, Donor Agencies

8.0 Conclusion:

The action plan for 3R prepared for the City Corporations/Municipalities has been based on the prevailing activities and future programs taken by different ministries and agencies. The guiding principles of the National 3R strategy have been followed in preparation of the action plan. A target has been set with gradual incremental percentage of attainment in consultation with the City Corporations based on their human and financial resources. Capacity building, awareness development and political commitment are the important drivers to make the action plan workable. The ultimate goal of the Action Plan is to establish a recycling oriented society where sustainable production and consumption are realized which can be achieved through gradual implementation of the targets set in the 3R Action Plan.