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Bangladesh National 3R Workshop Report

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Acknowledgement

The National 3R Workshop in Dhaka, Bangladesh, was successfully conducted on 27-28 February 2007. The Department of Environment (DoE) / Ministry of Environment and Forests, Waste Concern, and the United Nations Centre for Regional Development (UNCRD), the co-organizers of the workshop, wish to jointly appreciate the following organizations/entities.

Much credit must be extended to the workshop participants that come from a wide range of groups, including government offices, private sector, NGOs, and international organizations who actively shared their experiences on issues related to waste management and 3R promotion. They contributed substantially to consolidating the recommendations in the three areas, namely municipal solid waste management, medical waste management, and industrial and hazardous waste management, including the need of a comprehensive National 3R Strategy.

Gratitude is expressed to the media for their presence at the workshop, and for the extensive coverage in the local newspapers (See Annex). Such visibility will be most beneficial to the citizens of Bangladesh, as public awareness raising is very much in need in the field of 3R.

Japan has been very active in promoting 3R as a means to maintain the carrying capacity of the environment. Such efforts have eventuated in a global movement, for example, the G8 countries agreeing to launch the 3R initiative in 2005. The Bangladesh National 3R Workshop has been financially supported by Ministry of the Environment of Japan (MoE-J), as part of its broader efforts in promoting 3R in the developing countries, and more specifically, as an integral component of its assistance to DoE/MEF Bangladesh in promoting 3R, which has been jointly managed by UNCRD and the Institute for Global Environmental Strategies (IGES). High appreciation goes to the continuing support by MoE-J and to IGES as the implementing partner.

DOE/UNCRD/Waste Concern-National 3R (Waste Reduce, Reuse and Recycle) Workshop Dhaka, Bangladesh 27-28 February 2007

Report of the Workshop

Introduction

The Workshop had been the follow-up of a Contract agreed upon between the Institute for Global Environmental Strategies (IGES), Japan and the Department of Environment (DoE), Ministry of Environment and Forests, Government of the People's Republic of Bangladesh on Promotion of Reduce, Reuse and Recycle (3R) related activities in Bangladesh. Purpose of the Agreement as per the TOR, *inter alia*, had been

- a) Organizing a National Workshop on 3R in Bangladesh; and
- b) Construction of a community-based composting plant (1.5 ton capacity) in one of the Municipalities in Bangladesh.

The primary objectives of this Workshop has been to

- increase awareness and foster knowledge of 3R related principles, policies, tools and technologies among key government agencies and other stakeholders in Bangladesh;
- facilitate discussion on the possible formulation of a National 3R Strategy for Bangladesh through a participatory process involving all stakeholders concerned; and
- introduce and disseminate outputs/outcomes of the Senior Officials' Meeting on 3R held during 6-8 March, 2006 in Tokyo, Japan.

Organization of the Workshop

The Workshop was organized under the joint auspices of the Department of Environment (DoE), Govt. of the People's Republic of Bangladesh, United Nations Centre for Regional Development (UNCRD) and the Waste Concern and was supported by Ministry of Environment, Japan, the Institute for Global Environmental Strategies (IGES), South Asia Co-operative Environment Programme (SACEP) and United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

Keeping the primary objectives, as noted above, in view, the Workshop aimed to provide an indepth review on selected issues related to 3R in Bangladesh. These issues, *inter alia*, had been

- 1) to learn about the international experiences on 3R
- 2) municipal solid waste management
- 3) medical waste management

- 4) industrial and hazardous waste management' and
- 5) way forward to promote 3R in Bangladesh and the need for National 3R Strategy.

The National 3R Workshop was held during 27-28 February 2007 at the Conference Room of RDEC Building of LGED Bhaban, Agargaon, Sher-e-Bangla Nagar, Dhaka.

DAY-1

Inaugural Session

The Workshop started with its Inaugural Session at 10.30 am on 27 February 2007 following a recitation from the Holy Quraan. The following personalities were on the dais to grace the occasion.

Dr. C.S. Karim, Hon'ble Advisor, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, as the Chief Guest;

Mr. Mohammed Anwarul Iqbal, Hon'ble Advisor, Ministry of Local Government, Rural Development and Cooperatives, Government of the People's Republic of Bangladesh, as Special Guest;

Mr. Kazunobu Onogawa, Director, United Nations Centre for Regional Development (UNCRD), as Special Guest;

Mr. S. M. Jahrul Islam, Secretary, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, as the Chairperson;

Dr. Khandaker Rashedul Haque, Director General, Department of Environment, Government of the People's Republic of Bangladesh; and

Mr. A. H. Md. Maqsood Sinha, Executive Director, Waste Concern.

Dr. Khandaker Rashedul Haque, Director General, Department of Environment while making his Address of Welcome, referred the positive benefits as well as generation of enormous volume of wastes posing unexpected burden of pollution to the society, economy and the overall environment of the country. Although the Department of Environment, as the technical arm of the Ministry of Environment and Forests, is engaged in promoting reduction and recycling of wastes and taking proactive measures in this direction, there is still a need of a national '3R strategy' as well as that of a well-coordinated 'action plan' for effective and sustainable management of all kinds of wastes being generated through various socio-economic activities in the country, he added.

Mr. Kazunobu Onogawa, Director, UNCRD, in his Address as a Special Guest of the occasion, referred to the concept of 3R which is being highlighted during this year following the initiative of

G8 countries to promote 3R activities. He said that this particular Workshop has been aimed to promote 3R in the national level of Bangladesh toward developing a national strategy for effective, fruitful and sustainable management of municipal solid wastes, industrial and hazardous wastes and medical wastes. Materials containing various wastes that are being transported from one country to another pose adverse environmental and health consequences to recipient countries. To stop such consequences and also as a homework in the transporting countries as well as toward containing and abating the waste generated within individual countries, the 3R concept is the most vital tool and is of significant importance, he added.

Mr. S. M. Jahrul Islam, Secretary, Ministry of Environment and Forests, in his Address as the Chairperson of the Inaugural Session of the Workshop, referred to a number of steps his ministry has taken toward developing a proper system of waste management. These steps are: development of a draft "Solid Waste Management Handling Rules" through the Sustainable Environment Management Program (SEMP) with support from UNDP; the Dhaka Declaration, 2004 of the South Asian Association for Regional Cooperation (SAARC) underscoring need to encourage NGOs and private companies toward establishing community-based waste segregation at source, separate collection and resource recovery with particular focus on composting; development of "Battery Waste Recycling Rules 2006"; banning the use of polythene bags; etc. Besides, the ministry is also promoting Clean Development Mechanism (CDM) under Kyoto Protocol, where emission-trading could facilitate FDI in the country. Two waste-based projects using CDM have also been developed, he added.

Mr. Mohammed Anwarul Iqbal, Hon'ble Advisor, Ministry of Local Government, Rural Development and Cooperatives, Government of the People's Republic of Bangladesh, in his Address as Special Guest of the occasion termed the urban population in Bangladesh which is growing at the rate of 5.5 per cent per annum as being twice the rate of national average. Such a situation makes the cash-strapped municipalities unable to cope with the daily generation of huge volume of solid wastes associated with the high load of Urban population. Of the generated solid wastes, only 30-40% is being collected by the municipalities and the rest remain along road-sides and in drains and low-lying areas contributing to the deteriorating quality of the urban environment. In this backdrop, Mr. Iqbal laid considerable stress upon the Workshop and the 3R concept.

Dr. C.S. Karim, Hon'ble Advisor, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, in his extempore Address as the Chief Guest of the occasion, termed waste as the curse as well as an integral part of development. Referring to development as having many facets involving generation of wastes some of which could be benign while some could be dangerous as well as hazardous, he opined for optimizing the development process through proper treatment and management of such wastes. He said that the Government has program to manage wastes in an integrated way with participation of relevant stakeholders. Still, there is a need to build up in-house facilities for storage, segregation, management and disposal of

wastes at the household, industry, hospital, public utility services (e.g., power generation and distribution system) levels. Dr. Karim referred to the phenomenon of climate change which may be hastened by and may cause much more hazard due to ineffective and unsustainable management of wastes. It is in this backdrop the Workshop as well as the 3R itself assumes considerable importance, he added.

Mr. A. H. Md. Maqsood Sinha, Executive Director, Waste Concern, while making the Vote of Thanks to the dignitaries on the dais as well as to the audience of participants of the Workshop and other guests of the occasion, termed 3R as not a new concept in the region, particularly in Bangladesh. In various forms or other, such a concept has been practiced in the country since time immemorial. Waste generated during the agricultural practices and also in the households had first been dumped at a definite place with time allowance for decomposition and thereafter had been reused as natural manure back in the agricultural field again. While referring to the experience of Waste Concern at the ground level in promoting 3R, Mr. Sinha said that 90% of the production inputs were never used in the final product and 80% of all consumer products were discarded after a single use. The Waste Concern had also found end-of-the-pipe solution to wastes based on landfill as being unable to address the problem. Solution needs to be focused upstreamly and should be socially, climatologically, economically and environmentally feasible and, hence, is the significance and necessity of 3R, he added.

Quite a significant number of representatives from various government, autonomous and nongovernment organizations participated in the Workshop. The complete list of participants appears at Annex-I

The Inaugural Session over, The Technical Sessions of its Workshop took place after the tea break of the fist day and continued over the next day. Summarized report is as under:

Technical Session-I

The session was chaired by and was devoted to International Experience in 3R. The theme paper was presented by Mr. Yashiro Kaburagi of UNCRD

The paper presented by Mr. Kaburagi highlighted, *inter alia*, the concepts of wastes hazardous wastes, medical wastes, e-wastes and cars, the 3R practices, fundamental issues pertaining to rapid expansion of economies and population as well as insufficient legal systems, structure and management of wastes, technological capacity trained personnel and public awareness in Asian Countries; the 3R starting as breakthrough and solution in bringing abort economic and environment benefits, etc.

Text of the presentation appears at Annex-II

DAY-2

The second day (26 February 2007) of the Workshop witnessed the rest four of the Technical Sessions.

Technical Session-II

The Session was chaired by Mr. Masakazu Ichimura of UNESCAP. Six papers were presented during the session. The sequence of presentation had been as under:

- a. Municipal SWM and recycling by Mr. Iftikhar Enayetullah of Waste Concern. The paper highlighted brief information about waste concern, approach followed by Waste Concern toward solving the problems arising out of urbanization and SWM situation in Bangladesh, etc.
- b. Composting and RDF Experience of Chittagong City Corporation by Engr. Abul Hasnat, Chittagong City Corporation. The paper highlighted the various aspects of composting and RDF and steps taken by Chittagong City Corporation toward treatment and recycling of garbages. It also referred to the profit aspects of garbage recycling.
- c. Municipal SWM and Recycling in Secondary Towns: Experience of LGED by SK. Amjad Hossain, Local Government Engineering Department (LGED). The paper highlighted the current SWM scenario in Bangladesh in view of urbanization and development issues; policies of the government in relation to the scenario; specific response of LGED in dealing with urban issues; strategy and objectives of SWM component of LGED's Secondary Towns Integrated Flood Protection (Phase-2) Project, etc.
- d. Problems and Prospects of Plastic Waste Recycling in Bangladesh by Mr. Iftikhar Enayetullah, Waste Concern. The presentation was based mainly on primary data collected in Dhaka City Corporation area during August-November, 2005 through a survey conducted by Waste Concern. It highlighted the growth of plastic wastes in DCC area; recycling of various types of plastic wastes; economics plastic recycling and recycled product; and projected economic gain through promoting more recycling of plastic wastes.
- e. Plastic Waste Recycling Strategy for Bangladesh by Professor Dr. Ijaz Hossain, Bangladesh University of Engineering and Technology (BUET). The paper referred to 'plastics' as a perception problem in Bangladesh. It outlined the benefits plastics as an inert material, a by-product of oil industry, a substitute of and cheaper than materials from steel to wood, a recyclable material, and, at the end of recycling life, its convertibility to useful fuel. If 100% recycling was possible, the environmental impact due to plastics could have been zero, and Bangladesh had all the natural advantages to achieve the goal, the paper continued.

Technical Session-III

The session was chaired by Mr. Masakazer Ichimura of UNESCAP and was devoted to Medical waste Management. Two papers were presented during the session. There were.

- a) Medical Waste Management Experience of SEMP by Mr. Mohammad Qamar Munir, Project Director, Institutional and Policy Support Unit (IPSU), Ministry of Environment and Forest. The paper briefly and adequately highlighted the draft Medical Waste Management Rules developed by IPSU with the MWM Implementation Model, Community-based Urban Waste Water Treatment Project by PRISM, Bangladesh and Community-based Urban Solid Waste Management in Dhaka by Waste Concern.
- b) Medical Waste Management Using EMS: Experience of Noor Medical Services by Ms. Laila Arjuman Banu. Team Leader and Dr. Sayeed, Manager, Noor Medical Services. The paper briefly described the environment management system involved in the management of medical wastes by Noor Medical Services.

Technical Session-IV

The Session was chaired by Professor Dr. Ijaz Hossain, BUET and was devoted to the theme Industrial and Hazardous Waste Management. The following papers were presented.

- a. Industrial Waste Management Experience of Bangladesh Bangladesh Environmental Management Project (BEMP) by Syed Md. Iqbal Ali, Bangladesh Environment Infrastructure Support Project (BEISP), Department of Environment. The paper highlighted the various aspects of Madhobdi Pilot Textile Effluent Treatment Plant as a demonstrative of 3R. The aspects included: good housekeeping, waste minimization, pre-treatment of effluent prior to reed-bed treatment, reed-bed treatment, sludge management, etc.
- b. Lead Acid Battery Collection and Recycling Program by Mr. Munawar Misbah Main, President, Bangladesh Accumulator & Battery Manufacturers' Association (BABMA). The presentation highlighted the objectives of lead acid battery collection and recycling program; initiatives by BABMA members toward undertaking awareness program; safe collection and recycling of used batteries; putting logistic and infrastructure support in place; and establishment of Basic Battery Recycle Plant. The paper also mentioned the future plan of BABMA to enhance collection and recycle efficiency of used batteries to 100% and to implement automated recycle plant.
- c. Industrial Waste Management using EMS: Experience of Hatil Industries by Better Business, Swiss Contact, KATALYST. The presentation highlighted the EMS practice in the management of wastes through a) improvement of drinking water facilities, b) improvement of

fire-fighting and safety measures and also c) the financial benefits of using wastes instead of diesel as fuel in boiler.

- d. POPs Waste Management by Dr. Hirendra Kumar Das, Project Manager, POPs NIP Project, Department of Environment. The paper presented by Dr. Das highlighted, *inter alia*, the definition and categories of POPs, POPs wastes and stockpiles in Bangladesh, management priorities of various categories of POPs, POPs wastes destruction technologies with specific reference to Bangladesh situation, proposed priority projects in NIP, etc.
- e. Radioactive Waste Management by Dr. Satyajit Ghose, Institute of Nuclear Science and Technology (INST), Atomic Energy Research Establishment (AERE), Bangladesh Atomic Energy Commission (BAEC). Presentation made by Dr. Ghose was based upon the paper entitled 'A Status Report on Health Physics and Radioactive Waste Management Unit (HP&RWMU) of AERE, Savar authored jointly by Dr. Ghose himself and Dr. Moinul Islam. During the presentation, Dr. Ghose referred to the classification of radioactive wastes in various ways depending upon its origin, radiological properties, half-lives, heat generations, intensity of penetrating radiations, activity and concentration of radionuclides, surface contamination, etc. Radioactive wastes could be solid, liquid, gaseous or mixed depending upon their physical states. These wastes could also be classified as alpha-bearing and beta-gamma bearing according to their radionuclide composition. Describing the present activities of HP&RWMU and the relevant facility, Waste Management Strategy with specific reference to redioactive wastes, Dr. Ghose highlighted the various aspects of radioactive waste management together with the mixed system followed in HP&RWMU of AERE in waste management strategy. He said that BAEC has been the regulatory authority in Bangladesh for nuclear safety and radiation control as per Nuclear Safety Control Act, 1993.

Technical Session-IV over, the participants were split into three Working Groups to discuss issues and come out with recommendations pertaining to a) Municipal Solid Waste Management, b) Medical Waste Management and c)¹Industrial and Hazardous Waste Management.

Technical Session-V

This Session witnessed the presentation of the paper entitled 'National 3R Strategies – Needs, Concepts and Principles' by Choudhury R.C. Mohanty, UNCRD. The paper highlighted the expected core strategy involving 3R toward bringing about changes in consumption and production patterns at all levels. It described the essential elements of a sound national 3R strategy, viz., legal framework, institutional mechanism, social and cultural considerations, economic/marketing potential, technological dimensions, collaboration at local/national levels, international cooperation and obligations, linkage to MDG and public awareness. The paper also described the strategy and on-going activities of UNCRD toward promoting 3R.

Text of presentations made bye Mr. Mohanty appears at Annex-III.

All the above sessions witnessed active interactions from the audience of participants.

Concluding Session

The Concluding Session of the Workshop was graced by the presence of Mr. Sadek Hossain Khoka, the Hon'ble Mayor of the Dhaka City. Presided over by Dr. Khandakar Rashedul Haque, Director General, Department of Environment, the session started with the presentation of the Workshop Recommendations by the three Workshop Groups. Details of the recommendation appear at Annex IV.

Mr. Sadex Hossion Khoka, the Hon'ble Mayor of the Dhaka City Corporation in his Address as the Chief Gust of the occasion mentioned that about 4000 tones of wastes are generated in the City of Dhaka everyday. He stressed upon the need of practicing 3R to overcome the problem caused by such a huge volume of wastes. Hon'ble Mayor informed of a master plan drawn up by DCC in collaboration with JICA to this end. He also stressed upon the cooperation among DCC in civil society, media and experts, environmental education with special focus on solid waste management. He hoped that DCC will be able to address the situation with active cooperation of all concerned agencies and the citizens at large toward ensuring a cleaner and healthier city.

Dr. Khondaker Rashedul Haque while summing up the activities of the 2-day workshop termed the workshop as having been successful in creating relationship among various stakeholders and coming out with a set of recommendations. Referring to the 3R strategies as very much essential for Bangladesh, Dr, Haque emphasized upon devising strategies and mechanism to match the demand posed by wastes. Recommendation that came out of the Workshop had been really pertinent to management of the problem and could be placed before the government for translating those to action, he opined. Dr. Haque thanked the Government of Japan and hoped the cooperation to continue during the coming years.

The Two-day National 3R Workshop came to a successful conclusion after the Address of the Chairperson.

Opening Session

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Fundamental Issues in Asian countries

•Rapid expansion of economies & population

facing severe waste management problems rapid increase of waste quantity & diversification of wastes (ex.hazardous wastes, sophisticated products)

•Insufficient legal system, structure of waste management, technological capacity, trained personal, and public awareness

comprehensive improvement program is needed national strategy is needed

3R strategy is BREAKTHROUGH(1)

Landfill site shortage is very severe. Minimization of landfill wastes is vital

Pollutants like heavy metals in waste products and industrial wastes may cause irreparable pollution-related diseases and severe, costly environmental pollution.

Properly recover valuable resources and save costs caused by environmental pollution

3R strategy is BREAKTHROUGH(2) Uncontrolled Biodegradation of organic

wastes may cause water pollution, odor, insect-related diseases, etc. like open dumping

Properly recover valuable resources and save costs caused by environmental pollution

utilize as feedstock, compost and renewal materials like biomass energy.

3R is a hopeful breakthrough !

() Control with the Control for August I transformer (1982)

3R as the solution

Implementing 3R has enormous economic & environmental benefits because it will...

- 1. Minimize environmental and health risks
- 2. Improve productivity and resource efficiency
- 3.
 Prevent global warming

 4.
 Create employment

 Job Creation:
 Computer Reuse

 Job Creation:
 Reuse and Recycling Vs. Disposal

 Reuse and Recycling Vs. Disposal
 Presc (model Manufacturers)

 Presc (model Manufacturers)
 25

 Presc (model Manufacturers)
 26

 Commitional
 Material

 Account (model Manufacturers)
 26

 Commitional
 4

 Landfill and Incineration
 4

 Source: Institute for Local Self Reliance, "Waste to Wealth", available from: http://www.list.org/recycling/recyclingmeansbusiness

Major Initiatives....

- Agenda 21 / Chapter 4 changing consumption patterns
- UN Guidelines for Consumer Protection (as expanded in 1999)
- WSSD 2002/ JPOI Chapter 3/Para 22 changing consumption and production patterns at all levels – waste management with highest priority to waste prevention and minimization, by encouraging production of reusable consumer goods and biodegradable products and developing the infrastructure required for reuse, recycle, and environmentally sound disposal
- 30th G8 Summit at Sea Island, Georgia, June 2004
- Ministerial Level Conference on 3R, April 2005 and Senior Officials Meeting (SOM) on 3R, March 2006, both held in Tokyo, Japan

() Children and the Control for Regiment Providence (1982)

Ministerial Level Conference on 3R April 2005, Tokyo, Japan (1) Participating countries (20 countries) and international organizations (UNEP, OECD, Basel Convention Secretariat, etc.) made the following key recommendations with respect to the promotion of international co-operation for 3R Countries should make efforts to improve resource efficiency and prevent environmental pollution from wastes. International cooperation among developed and developing countries may start with the sharing of experiences, joint research, and capacity-building activities. Regarding capacity-building, issue-specific and country-driven

- Regarding capacity-building, issue-specific and country-driven approaches are especially recommended.
- Possible priority areas for capacity-building include (a) the establishment/improvement of legal frameworks, (b) the development of national strategies, and (c) the sharing of best practices undertaken in developed and developing countries.

(Cont'd)

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Ministerial Level Conference on 3R - April 2005, Tokyo, Japan (2)

- Key recommendations with respect to the promotion of international co-operation for 3R
 - Transfer of technologies could be efficiently promoted through a regional centre approach.
 - Promotion of 3R could also contribute to addressing climate change issues.
 - Regional cooperation, especially South-South cooperation, should be facilitated.
 - Importance of economic instruments and other incentives should be made more prominent in order to promote 3R activities in a more economically efficient manner.
 - International cooperation to share information and to build understanding on common priorities and opportunities for more innovation in product eco-design is needed.

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UNCRD's project proposal on 3R/SPC...

Objectives

- Increase <u>awareness and capacity at local and regional</u> level on various aspects of 3Rs/sustainable production and consumption through trainings and consultations
- Facilitate North-South and South-South
 cooperation/partnership on the <u>exchange of 3R related</u>
 information, tools/technology, best practices
- Assist countries in developing comprehensive local/national work programmes/strategies towards promoting 3R/sustainable production and consumption practices
- Support and promote improved <u>regional networking</u> by institutions and experts working on various aspects of 3Rs/sustainable production and consumption
- Contrart and Contra for Angland Angelagenet (UNCAS)



Country Priorities: Bangladesh Training /Awareness Programs on SPC/3R tools (LCA, ISO Standards, eco-label, etc) Demonstration projects environmental cost internalization environmental performance evaluation of selected industries (tannery, textile, etc) hospital waste management (on-site segregation of medical waste is a big issue!) promotion of composting of organic wastes Networking of South Asian countries – Demosting is a big issue is a big is

-Promotion/exchange of best practices/success stories on waste minimization



Country Priorities: Cambodia, Laos, Viet Nam

- Training /Awareness Programs on 3R/SPC tools (LCA, ISO Standards, eco-label development, green procurement, etc.)
- Guidelines/criteria for developing eco-labels
- Formulation of a Strategy (cum-Action Plan) for Waste Minimization through Sustainable Consumption & Life Cycle Approach
- Performance assessment of SMEs (Cambodia)
- Recycling/Disposal of Hazardous Batteries

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Country Priorities: Indonesia (2)

- Promotion of CP within SMEs textile,tannery, food, chemical, and metal industries
 - A. Provision of experts for
 - > Training/awareness programs on CP for SMEs
 - > CP Implementation
 - CP Audit/Assessment
 - **B.** Introducing pilot model

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- > for waste minimization equipment/technology
- resource minimization (gas, water, electricity)
- C. Revitalization of CP Center in Cluster



Country Priorities: Thailand

- Training/public awareness programs on LCA
- Strategy formulation for Waste Minimization through LC approach & SC
- Research and Development for promoting indigenous knowledge (and natural products)
- Promoting awareness and technology for reducing plastic waste
- Regional forum & information hub to share knowledge and experience on SC– website links to Ministries of participating countries, newsletters, chat-rooms
- Media sensitization study visits/workshops for the media on SPC/CP/3R
- Management of used mobile phone batteries

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Asia 3R Conference (1) 30 Oct- 1 Nov 06, Tokyo, JAPAN

- 1. Participants
- 19 Asian Countries,
- 8 International Organizations (incl. UNCRD)
- 5 G8 Member countries & Community

2. Focal Points for Discussion

- (1) Partnership and International Cooperation for the Promotion of the 3Rs
- (2) Medical Waste Management
- (3) Municipal Organic Waste Management
- (4) E-waste Management

Asia 3R Conference (2) Major points of the chair's summary

- 1. Participants shared the importance of promoting 3Rs in Asia.
- 2. Participants recognized the necessity of further regional cooperation to promote the 3Rs in Asia.
- 3. Participants appreciated Japan's initiative on 3Rs in Asia.

Asia 3R Conference (3)

- Clarified important fundamental points through discussions
- 1) Legal system for waste management is not fully established in many countries.
- 2) Definition of waste is not always clear and should be clarified (ex. Medical waste).
- 3) Responsibility and role of each stakeholder are not always clarified.
- 4) Technical standards & guidelines are insufficient.

For promotion of national strategy and legal system

- 1. Basic idea of "wastes"
- 2. Legal system Japanese experiences



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What are wastes(2)

Some simple examples to show you ;

- 1. Necessity of basic and general law for waste management.
- 2. Necessity of specific legal systems for each special wastes according to characteristics.
- 3. Built-in 3R ideas on legal system is useful to establish environmentally sound waste management and sustainable development.

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ex.1 Hazardous waste(2)

"How to handle such hazardous sludge ?"

3R

Extract metals and utilize them as resources reduce environmental risk & save natural resources encourage technological innovation

OLD FASIONED "proper" disposal way Construct isolated concrete pits and dump (store)

need strict inspection for construction & maintenance Debt to future generation & environment



ex.2 Medical waste

"Are all Health Care Wastes Infectious or Harmful Medical Wastes ?"

10-30% Infectious, Harm, Toxic, Hazardous 70-90% General Wastes (paper, linen, etc. without contamination of blood or hazardous substances)

If segregated properly, 70-90% of wastes can be treated as general wastes.

establishment of proper Segregation System at sources is the key for success.

ex.2 Medical waste(2)

- "Who can identify infectious wastes at sources ? "
- Medical staff can identify infectious wastes. toxic, or hazardous medical wastes at sources.
- If apart from sources, identification may be difficult (ex. appearances before and after boiling for sterilize needles are same)
- In some case, even at sources, waste segregation is impractical (ex. while surgical operation)

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ex.2 Medical waste(3)

Detailed & Concrete Action Guidelines enable 3R & proper management of medical wastes

- Identify institutional & technical matters role & responsibility of each section/staff waste segregation rules & manuals
- Use equipments and materials suitable for medical wastes, such as special collection boxes for infectious wastes /sharps (antipierce, blood proof, indicate bio-hazard mark, etc)

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Lessons from Medical waste

Clear definition of infectious waste, hazardous waste, etc. and clarification of responsibility of stakeholders are needed. Legal definition should be defined

Stakeholders responsibilities and prohibited materials should be clarified

Concrete Guidelines besides laws and regulations are needed to manage hazardous wastes properly.

Awareness Raising is inevitably important

ex.3 E-waste and cars

"E-wastes and cars contain many kinds of valuable resources like pure metals" But...

- "Cellular phones are too small to collect precious metals by hands."
- "Spilled waste oil during scrapping cars may cause water and soil pollution."
- "Open-burning of shredded dust of home electric appliances is an easy way to collect metals, but causes air pollution and odor nuisance."

Lessons from E-waste and cars

Efficient and environmentally sound resource recovery of highly sophisticated products requires high technology and suitable facilities

Involvement of manufacturers is the key for success

- They have detailed information of contents & structures of the products and can find the most efficient way for reuse & recovery
- They can create designs in line with 3Rs



Japanese legal system on waste management and 3Rs

- 1. Integrated Policy and Measures to Promote 3Rs
- 2. Legal Structure
- 3. Fundamental Law on the Establishing a Sound Material-cycle Society
- 4. Waste Management Law
- 5. Law for promotion of Effective Utilization or Resources
- 6. Law on Promoting Green Purchasing
- 7. Recycle Laws for Specific Wastes

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Fundamental Law on the Establishing a Sound Material-Cycle Society

Purpose: - Secure Material Circulation in society - Reduce Irreversible Natural Resources

- Lower Environmental Impact Caused by Consumption Contains of $\ :$

- Basic Principals
- Responsibilities of National Gov./ Local Gov./
- Business Sector/ Individuals as consumer
- Measures/Policies conducted by the National Gov.
 Fundamental Plan for Establishing a Sound Material-Cycle Society
- setting numeral targets, making coherent efforts in order to effectively promote individual measures

Waste Management Law (1) "Waste Management and Public Cleansing Law"

Purpose:

- Preserving the living environment & improving public health through the restriction of waste discharge, appropriate sorting, storage, collection, transport, recycling, disposal, or the like of waste
- conservation of a clean living environment

Characteristics of the Law;

- Basic Law to establish proper waste management
- Regulations of this law and related orders/standards are applied to every waste management activity including reuse & recycle, unless other rules are authorized to apply by another laws to promote specific waste recycle.
- Base of compulsory technical standards/guidelines/manuals to pursue the purpose of the law

💓 (1994) within Contro Jac August Development (1993)

Waste Management Law (2)

Define and classify "Waste

- Municipal Waste & Industrial Waste Kinds of harmful wastes are specified and are designated to be specially controlled as "Specially Controlled Waste" ex. Infectious waste

Clarify each stakeholders responsibility & role

- Municipalities should manage municipal waste Owners of land/buildings must endeavor to cooperate with the municipalities
- Businesses must ensure appropriate management of their industrial waste (Polluter Pays Principal)
- MOE shall specify the basic policy, prefectures shall specify waste management plan in line with the basic policy, and municipalities shall specify a definite plan for municipal waste management in their administrative area. ctures shall specify etc.
- (1) Dailar matting Contro for August

Waste Management Law (3)

- Regulate waste handling action, treatment/disposal facilities and waste management service
- Specify concrete & compulsory technical standards for storage, collection, transport, treatment, recycle & final disposal
- Prohibit actions that do not fulfill the standards
- Specify industrial waste tracking system

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- Specify structure and operation standards for waste treatment facilities
- Specify permission grant standards for waste management services and facilities.

Waste Management Law (4)

- Prohibit operation waste management service without permission of local government
- Prohibit construction and operation of designated facilities without permission of local government
- Prohibit illegal dumping and other environmentally improper waste management
- Strict sanctions for offenders of the law
- Encourage building proper facilities by public sector or its participation

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The Law for Promoting Effective Use of Resources

- Reduce and Recycle of By-Products
- Promotion of Recycled Materials/Parts Usage
- Promoting 3R Conscious Design/Production
- Indication (Sign) for Sort Out

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- Voluntary collection of used products by business sectors.
- Promotion of Effective Use of By-Production

Green Procurement Law

- Promotion for Procuring Green Products such as Rematerialized Products, Especially by Governmental sectors particularly National Governmental Sectors.

Eco-labeling Schemes in Japan Eco Mark Program in Japan Initiated in 1989. Administered by Japan Environmental Association (JEA) Type 1 Label (Third-Party Certification) Aims to disseminate information on the environmental aspects of products and to encourage consumers to choose environmentally sound products. 54 product categories, 5415 certified products for items sold in Japan Eco Mark Products must meet the following requirements Products that impose less environmental impact than other products in the same categories at each stage of "manufacturing", "use" and "disposal". Products that reduce the environmental impact in other ways, thus contributing significantly to environmental conservation.









Demolition Contractors Registration under the CMRL

- 1. Demolition contractors are responsible for sorting & recycling construction wastes
- 2. Demolition contractors must be <u>registered</u> at the prefectural government. (those who are already hold permission for construction work are exempt)
- <u>Requester of demolition work</u> pay the cost for proper demolition work (including sorting & recycling of demolished wastes)

Source: Ministry of Environment, Government of Japan, "Construction Material Recycling Law" (leaflet in Japanese), available from: http://www.env.go.jp/recycle/build/leaflet.pdf

Terror In Print Provide

Recycle Technologies for Construction wastes

Technology		Recycled products
Concrete and Asphalt Concrete	Sorted and Crushed (& Molded in some cases)	Road base Pavement Blocks, ditches Recycled concrete Recycled cement Recycled aggregate Recycled sand Foundation
Wood	Sorted and Crushed (& Molded in some cases)	Wood board (for external facing) Wood chips (for mulch, compost, paper, fuel wood pavement, recycled wood*, soil conditioner, humidity control) Particle board Charcoal * Recycled wood= fabricated by wood chips and plastic
Steel	Sorted, Shredded and Melted	Iron sheet Steel pipe
Sourzes: The Committee for the Promotion of Recycling of Construction Dyproduct, available from https://www.aithik.edg.ip/outmic/source/index.html Sataram Perfork/Jer. These construction by-product, available from http://www.perel.sataram.ag.ip/Ad0B/CD/0g/kan/recyclere; sal_gazou.htm; http://www.handath.abthi- c.edj.pkken/noda/nodaramsakuu.htm; Mite Prederuzia Center of Constructional Technology, "Overview of Recycling Information", available from: http://www.mie-kengi.or.p/recycle/files/recycle data.pdf		

























































Stocking -Stock precisely in accordance with manufacturing/selling (Numerical Examination of the amount of stocking) (M. W. R. S) -Change stocked materials/products to reduce the loss of them in stoc (Quality Examination of stocking materials/products) (M. W. R. S) -Decrease raw materials and increase cooked foods (R)	
Manufacturing/ Cooking Process	-R&D for less waste generating products (<u>M. R. S)</u> -Manufacturing/shipment in smaller lot (<u>M. R. S)</u> -Renovate cooking process for less food waste (<u>R. S)</u>
Logistics/ Storage	-Introducing later equipments for storage (Refrigerator etc.) (<u>M, W, R, S</u>) -Renovation of packaging/wrapping methods (<u>M, R</u>) -Improvement of Inventory Management (<u>W, S</u>)
Market Process	-Estimate more accurately in manufacturing/cooking/selling for less food waste generation (<u>M, W, R, S</u>) -Discount for expiring foods (<u>M, W, R</u>) -Selling products/foods/in smaller quantities (<u>R, S</u>) -Introducing new menus, examine amount of serving (reducing amount) (<u>S</u>)

Technologies ~ Bio-Gas Electric		ectric Generator ~	
Area (Site)	4,800 m²		
Area (Building)	1,500 m²	3	
(Period)	N/A		
Technologies	Fermentation, Gasification		
Capacity (Waste)	110 t / day		
Estimated Generation	24,000 kWh Fuel Cell 250kW Gas Generator 250kW, 500kW		
Address	Inside Tokyo Metropolitan Area	No. of Concession, Name	
Operated by	Private Company		
Outline of the Facility (Source : Tokyo Metropolitan Government =TMG			
(i) Salar Andrea Lever de Argunel Angle and (1953)			

Techr	ologies ~Feed Ma	anufacturing Plant ~
Area (Site)	4,200 m	
Area (Building)	1,800 m	
Construction Cost	JPY 3 Bil. (Incl. Land)	
(Period)	1 year	
Technologies	Drying, etc.	
Building	Steel Flamed 3 stories above Height: 19 m	
Capacity (Waste)	140 t /day	
Estimated Production	25 t /day	
Address	Inside Tokyo Metropolitan Area	I ATOM
Operated by	Private Company	NIN AND
Outline of the Facility (Source : Tokyo Metropolitan Government =TMG)		
(i) Initial authors forms for Angines' Environment (1982)		

UNCRD seeks partnership and collaboration with relevant organizations and donors to carry out activities to promote 3R in developing countries

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Annex III: Presentation by Mr. Choudhury Mohanty





Lessons from issues concerning management of various type of wastes

Need of Basic/General Law for Waste Management Definition & classification of wastes, policy framework, role of public sectors & responsibility of polluter (Polluter Pays Principle) regulate proper disposal, technical standards, etc.

Need of Specific Law/Regulation, Guideline/manual for Specific Wastes General rules are not enough for some kinds of wastes and processes (ex. Medical wastes, involvement of manufacturers (EPR), disposal standards for hazardous wastes)

Need to promote 3R technologies in harmony with laws & guidelines Encourage private sector's investment for new industries & technology development (for resource efficiency, green designs, etc.)

(iii) Childred Matthing Control for Regiment Providerment (URCH2)

Changing consumption and production patterns at all levels – waste management with highest priority to waste prevention and minimization, by encouraging production of reusable consumer goods and biodegradable products and developing the infrastructure reuse, recycle, and environmentally sound disposal (WSSD 2002/ JPOI - Chapter 3/Para 22)

At the Core of the 3R Strategy should be ..



Essential elements of a sound National 3R Strategy

- 1. Legal framework
- 2. Institutional mechanism
- 3. Social and cultural considerations
- 4. Economic/market potential
- 5. Technological dimensions
- 6. Collaboration at local/national level
- 7. International cooperation and obligation
- 8. Linkage to MDG
- 9. Public awareness

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Essential elements of a sound National 3R Strategy (2)

Legal framework

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- comprehensive policy measures against illegal dumping as basic step
- specific legal systems for each special wastes according to characteristics (e.g., Japanese experiences).
- strategy should clearly underline the political will for promoting 3R and implementation of such legal systems through workable plan

Essential elements of a sound National 3R Strategy

Social & cultural considerations

- take into account social and cultural considerations with the goal of sustaining natural resources, protecting biodiversity, providing livelihood support, conserving water and energy, reducing human health risks, poverty reduction, etc.
- support existing cultural practices with the goal of supporting and protecting traditional /indigenous knowledge in reuse and recycling
- issues concerning informal sector health vs. livelihood, child labour, etc.



Essential elements of a sound National 3R Strategy

Economic/market potential

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- address investment potential towards waste reduction, which could be profitable for municipalities by reducing collection and transportation costs
- mechanisms to sensitize financial institutions to integrate 3R in to their lending practices, for instance, to SMEs
- mechanisms to promote financial instruments such as deposit-refund system, waste banks, tax rebates and subsidies, and CDM credits.

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Essential elements of a sound National 3R Strategy

Institutional mechanism

- decentralized network of institutions from national to local level with clearly defined roles and responsibilities for each (e.g., which agency to deal with what types of wastes)
- the institutional arrangements should support the regulatory framework and ensure appropriate monitoring and enforcement (e.g., to ensure that segregated e-waste or medical wastes are not later disposed along with municipal wastes)
- should consider involvement of NGOs, private sectors, research and scientific institutions, & local communities
- institutionalizing the informal sector involved in waste management (complex phenomenon not given due attention within formal institutional framework)

Essential elements of a sound National 3R Strategy Technological dimensions

- should address the needs for building national technology assessment capabilities as selection of a particular 3R technology have to be socially acceptable and economically
- should promote indigenous R&D on 3R technologies to meet local needs and market conditions
- provide mechanism to evaluate hazardous impacts, if any, of 3R technologies
- promote mechanism to encourage technological upgradations in product designs based on LCA
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feasible

Annex III: Presentation by Mr. Choudhury Mohanty

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Essential elements of a sound National 3R Strategy Collaboration at local/national level

- the principal strategy should be to bring together Ministries of Environment, Industry, Health and Finance to chalk out 3R plans and programs including capacity building programs, at local and national level
- promoting public-private partnerships (PPP) among national and provincial governments, municipalities, business, and NGOs for regional exchange of information and experiences, and implementing pilot and demonstration projects on 3Rs.

Essential elements of a sound National 3R Strategy 3R and MDG linkages (see the hand out for details)		
1. Eradicate extreme poverty and hunger	employment generation	
2. Achieve universal primary education	phasing out of child labour in informal waste management	
3. Promote gender equality and empower women	sharing burden in waste sorting, separation, and disposal	
4. Reduce child mortality	ensuring clean land, water, and air	
5. Improve maternal health	- do-	
6. Combat HIV/AIDS, malaria, and other diseases	clean water and land are essential to combat diseases like malaria	
7. Ensure environmental sustainability	sustainable production and consumption patterns, CP	
8. Develop a global partnership for development	enhanced international and regional cooperation among various stakeholders	
(1) Datted welling Center Jac August Development (URCH)		



Essential elements of a sound National 3R Strategy Public awareness

- Programs and measures to promote concept of environmentally sustainable cities and the role of 3R at different levels in government, industries, media, and civil society (e.g., in Japan)
- Mechanisms to promote consumer awareness programs by disseminating information pertaining to the reduction of waste generation beginning with the manufacturing stage
- · Mechanisms to promote green purchasing
- making environmental performance reporting mandatory for industries and hospitals to make the community aware of the health risks they likely to incur from hazardous and medical wastes

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Essential elements of a sound National 3R Strategy

International cooperation and obligation

- sound basis for international cooperation in the areas of -R&D, carrying out pilot/demonstration projects and training programs on best practices and innovative 3R technologies, cleaner production, green productivity, eco-efficiency, harmonization of EPR, etc.
- Should sets in motion required regulatory regime that will commit industry and business groups to issues like climate change and global warming (e.g, setting time bound targets for renewable energy contribution from bio-mass, to final energy consumption)
- Promote legal measures to ban illegal movements (
 transboundary) of hazardous wastes



Annex III: Presentation by Mr. Choudhury Mohanty





<u>At the down stream side</u> – take-back of used materials to reduce environmental load & input materials

1. Physical and/or financial responsibility of products or waste management at the post-consumer phase or at the end of life-cycle

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UNCRD's Strategy in 3R promotion

- set in motion 3R promotional activities in the context of Sustainable Regional Development
- address 3R in support of achieving MDGs
- initiate 3R projects in line with the outcome & recommendations of the April'2005 Ministerial Conference on 3R and the Senior Officials Meeting on 3R in March'2006

• promote 3R policies and tools at local and city levels in cooperation with sub-regional initiatives such as ASEAN Working Group on Environmentally Sustainable Cities (AWGESC)

United Nations Centre for Regional Development

Various EPR policy instruments

- Regulatory instruments (e.g, mandatory take-back, disposal bans and restrictions, material bans and restrictions, etc.)
- Economic instruments (e.g. advance disposal fees, deposit-refund, green procurement, removal of subsidies on virgin raw materials, etc.)
- Information instruments (e.g, environmental labeling, product hazard warnings, product durability warnings, energy efficiency labeling, use of CFC compounds, etc.)



UNCRD's on-going activities

•National 3R Strategies – provide necessary technical support to developing countries (e.g., Viet Nam, Indonesia, Bangladesh) with the funding support from MoE-Japan & ADB.

•Pilot and Demonstration projects – carry out in collaboration with various partners/organizations

•3R elements in UNCRD's Training Course on Regional Development

United Nations Centre for Regional Development

Annex III: Presentation by Mr. Choudhury Mohanty



Annex IV

Recommendations of the three Working Groups on

(A) Municipal Solid Waste Management (B) Medical Waste Management and (C) Industrial and Hazardous Waste Management.

(A) Group on Municipal Solid Waste Management.

- Each municipality should have its own master plan in addressing SWM issues efficiently with requisite strategies for implementation;
- Public awareness should be built up to bring about requisite changes in attitudinal and behavioral patterns;
- Institutional capabilities should be strengthened through provision of requisite and sufficient number of relevant equipment, adequate manpower with hands-on state-of-the-art training;
- Door to door and source to source collection system should be improved;
- Improvement should be brought about in the transportation as well as in the disposal systems;
- Provision should be made for appropriate and adequate legal support in solid waste handling by municipalities;
- Appropriate and adequate provision should be made for treatment and recycling of solid wastes; and
- GO-NGO partnership should be built up in the entire process.

(B) Group on Medical Waste Management

- Draft MWM Rules should be approved by relevant authorities following a consultative workshop on the issue;
- Guidelines on MWM should be finalized involving the line ministries, viz., Ministry of Local Government, Rural Development and Cooperatives, Ministry of Health and Family Welfare and Ministry of Environment and Forests;
- MWM course should be introduced in medical education and upcoming B.Sc. education in nursing;
- Provision should be made for active involvement of city corporations and municipalities in MWM;
- Private sector entrepreneurship should be developed in MWM; and
- Local Government Health Directorate should be authorized to enforce MWM Rules.

(C) Group on Industrial and Hazardous Waste Management

Waste Reduction

- EIA should be conducted prior to setting up new industries
- EMP should be drawn up for existing industries
- All industries, new and existing, should have their respective ETPs constructed and running;
- Regulatory bodies should be formed to oversee and ensure waste reduction processes;
- Provision should be made for adequate and efficient manpower and relevant equipment to follow-up the system;
- Campaign should be launched for generation of awareness among the relevant stakeholders
- Acquisition and functioning of BAT and BEP should be ensured;
- Each unit, where possible, should have its own composting and biogas plants.

Waste Recycling

- Recyclable and non-recyclable wastes should be segregated at source;
- Non-recyclable wastes should be disposed off after prior treatment;
- Awareness should be generated among relevant stakeholders;
- Requisite rules and regulations should be framed for efficient recycling of wastes;
- Recycling zone should be created;
- Feasibility study should be conducted for waste recycling.

Waste Reuse

- Recycled goods can be reused;
- Quality of reusable wastes should be ensured;
- Feasibility study should be conducted for reuse of wastes
- Provision should be made for marketing of products made of reused wastes.









UNITED NATIONS CENTRE FOR REGIONAL DEVELOPMENT

AGENDA

NATIONAL 3 R WORKSHOP IN DHAKA, BANGLADESH (27-28 Feb 2007 LGED-RDEC, Conference Room, Level 12, LGED Bhaban, Agragoan, Dhaka)

Organized by

Department of Environment/Ministry of Environment and Forest-Bangladesh United Nations Centre for Regional Development (UNCRD) Waste Concern

Supported by

Ministry of the Environment-Japan Institute for Global Environmental Strategies (IGES) South Asia Co-operative Environment Programme (SACEP) United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

Day 1 (27 Feb 2007)		
Time	Opening Session	
9:00-9:30 AM	Registration	
9:30-9:35 AM	Recitation from the Holy Quran	
9:35-9:45 AM	Address of Welcome by Director General, DOE-Bangladesh	
9:45-9:55 AM	Speech by Kazunobu ONOGAWA, Director of UNCRD	
9:55-10:05 AM	Speech by Secretary, MoEF, Bangladesh	
10:05-10:15 AM	Speech by Honorable Advisor, Ministry of Local Government Rural Development & Cooperatives	
10:15-10:25 AM	Speech by Honorable Advisor, Ministry of Environment and Forest (MoEF)	
10:25-10:30 AM	Vote of Thanks by Executive Director, Waste Concern	
10:30-11:15 AM	Tea Break	
11:15 AM-12:30 PM	Technical Session-I (International Experience on 3R)	
11:15-11:45 AM	Presentation on International Experience of 3 R by Mr. Y. Kaburagi, UNCRD	
11:45 AM-12:30 PM	Question and Answer	
12:30-1:30 PM	Lunch Break	
1:30-3:30 PM	Technical Session –II (Municipal Solid Waste Management) Session Chairman: Masakazu ICHIMURA	
	Presentation on	
	1. Municipal SWM & Recycling: Experience of Waste Concern in	
	Bangladesh by Iftekhar Enayetullah & A.H.Md.Maqsood Sinha	
	2. Composting & RDF Experience of Chittagong City Corporation by Mr. Imdad, Project Manager, Compost and RDF Project, Chittagong City Corporation	

	3.Municipal SWM & Recycling in Secondary Towns Experience of LGED by Sk. Amjad Hossain, Project Director, STIFPP-II, LGED	
	4. Problems & Prospects of Plastic Waste Recycling in Bangladesh, by Iftekhar Enayetullah, Waste Concern & Misha Mahjabeen, Swiss Contact	
	5. Plastic Waste Recycling Strategy for Bangladesh by Dr. Ijaz Hossain, Professor, BUET	
3:30-4:00 PM	Tea Break	
4:00-5:00 PM	Technical Session –III (Medical Waste Management)	
	Session Chairman: Masakazu ICHIMURA	
	Session Chairman: Masakazu ICHIMURA	
	Session Chairman: Masakazu ICHIMURA Presentation on	
4:00-4:20 PM	Session Chairman: Masakazu ICHIMURA Presentation on 1. Medical Waste Management Experience of SEMP by Mr. Qamar Munir, IPSU	
4:00-4:20 PM 4:20-4:40 PM	Session Chairman: Masakazu ICHIMURA Presentation on 1. Medical Waste Management Experience of SEMP by Mr. Qamar Munir, IPSU 2. Medical Waste Management Using EMS: Experience of Noor Medical, by Laila Arjun Banu, Waste Concern & Dr. Sayeed, Noor Medical	

Day 2 (28 Feb 2007)		
10:00 AM-12:00 PM	Technical Session –IV (Industrial & Hazardous Waste Management) Session Chairman: Dr. Ijaz Hossain, Professor Chemical Engineering Department, BUET	
	Presentation on	
10:00-10:20 AM	1. Industrial Waste Management Experience of BEMP by Syed Iqbal Ali, DOE	
10:20-10:40 AM	2. Lead Acid Battery Collection & Recycling Program in Bangladesh by Mr. Munawar Misbah Moin, President of Bangladesh Accumulator & Battery Manufacturers Association (BABMA).	
10:40-11: 00 AM	3. Industrial Waste Management Using EMS: Experience of Hatil Industries by Waste Concern & Better Business Swiss Contact-Katalyst	
11:00-11:20 AM	4. POPs Waste Management in Bangladesh by Dr.H.K.Das, Eco- Toxicologist, Project Manager, POP, NIP Project, DOE.	
11:20-11:40 AM	5. Radioactive Waste Management in Bangladesh, by Dr. Satyajit Ghose, Senior Scientific Officer, Bangladesh Atomic Energy Commission	
11:40 AM-12:30 PM	Group Discussion	
12:30-1:30 PM	Lunch Break	
1:30-1:45 PM	Wrap up discussion Needs for National 3R Strategy for Bangladesh Facilitated by Mr. C.R.C. MOHANTY, UNCRD	
1:45 PM-3:00 PM	Way Forward To Promote 3 R In Bangladesh (Closing Session) Session Chairman: Director General, DOE	
1:45-2:00 PM	Summary of Presentations of Three Working Group	
2:00-2:15 PM	Remarks by Mr. Yoshiro Kaburagi, Senior Researcher, UNCRD	
2:15-2:30 PM	Remarks by Mr. Masakazu Ichimura, UNESCAP	
2:30-2:45 PM	Remarks by DG, SACEP	
2:30-2:45 PM	Remarks by Honorable Mayor of Dhaka City Corporation	
2:45-3:00 PM	Remarks by Director General, DOE	