

# 3Rs for Green Economy

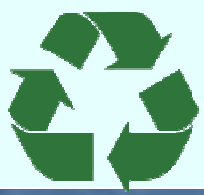
## *COUNTRY PRESENTATION*

Second Meeting of the Regional 3R Forum in Asia,  
4-6 October, 2010,  
Kuala Lumpur, Malaysia

**DR. MANJU RAINA**  
Additional Director  
Ministry of Environment & Forests  
Government of India  
October 2010

# Outline

1. The Context
2. Waste Hierarchy
3. Significant Achievements and Future Vision
4. Current Status and Emerging Trends
5. Conclusions and Recommendations



# 3Rs in India



- India attaches great importance to environmental protection, conservation and development. Its constitution enjoins upon the State to protect environment.
- Environmental governance by the Centre and the states (federal structure) –
  - Central list
  - State List
  - Concurrent list
- World's fifth largest economy with about 62% of population which depends directly on Agriculture and Industry.
- Industry, Manufacturing and Services Sector account for 25%, 16% and 46% of GDP respectively.

# POLICY STATEMENT ON ABATEMENT OF POLLUTION - 1992

The main objective is to integrate environmental considerations in the decision making process by

- *Pollution Prevention at source*
- *Protect highly polluted areas*
- *Involve public in decision making*



# NATIONAL ENVIRONMENT POLICY - 2006

## NEP lays stress on

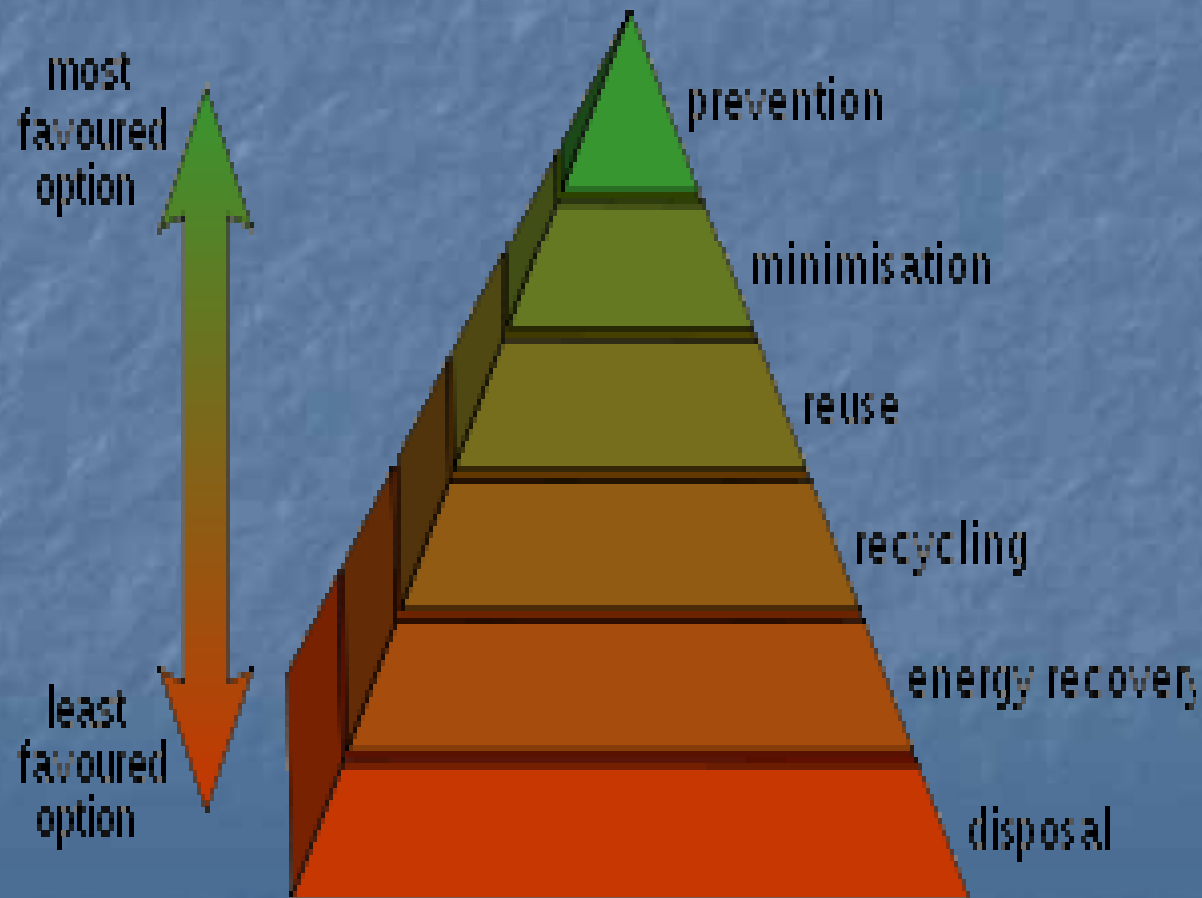
- *Adoption of clean technology*
- *Encourage reuse and recycling*
- *Strengthening informal sector*
- *Establish system for collection and recycling of materials*
- *Environmental safe disposal*



# Waste Hierarchy

- *3Rs classify waste management strategies according to their desirability -*

1. *Reduce*
2. *Reuse*
3. *Recycle*



# **SIGNIFICANT ACHIEVEMENTS & FUTURE VISION**

*Together with the Salient Features of select programmes*

# *Major Initiatives, Policies and Activities on the 3Rs in India*



**Charter on Corporate Responsibility  
for Environment Protection (CREP)**



**Waste Minimisation Circles**



**Clean Technologies**



**Comprehensive Environment  
Pollution Index (CEPI)**



**Common Effluent Treatment Plants  
(CETP)**



# CHARTER ON CORPORATE RESPONSIBILITY FOR ENVIRONMENT PROTECTION (CREP)

*The Government of India and the industry has entered into a partnership, breaking new ground for environmental protection. It was finalized at a national seminar of more than 300 representatives of the Central and State Governments, pollution control boards and 17 major polluting categories of industries held in New Delhi on March 13, 2003.*

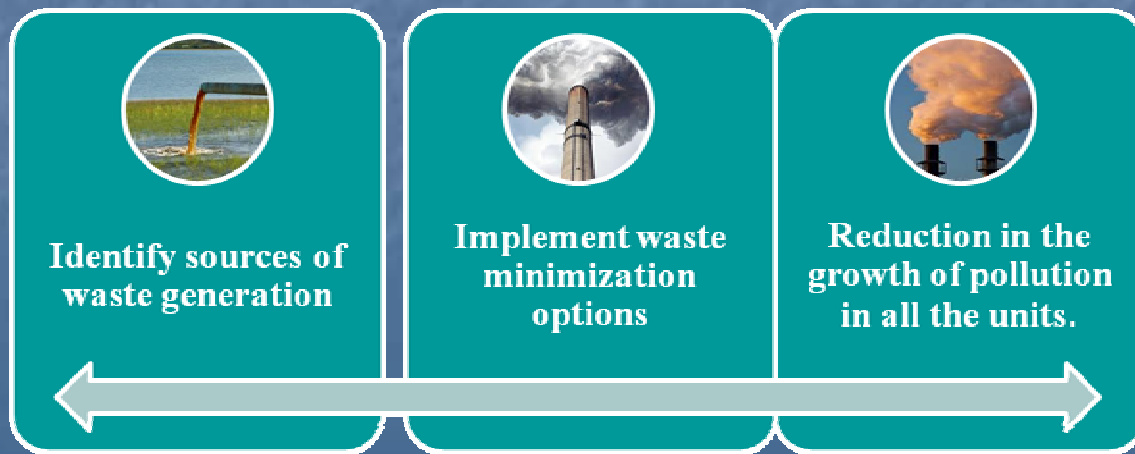


- The charter is a mutually agreed document between the Government and industrial houses, incorporating voluntary initiatives by 17 identified categories of industries to ensure total compliance with pollution control norms.*
- The measures to be taken by the industry include modernisation and technological upgradation of production processes, changing over to new technologies, waste minimization through reduced use of resources and re-cycling waste.*
- Other steps includes installation of pollution control and monitoring equipment, improving housekeeping practices and furnishing bank guarantees by the defaulting industries till compliance is ensured.*

# WASTE MINIMIZATION

**Waste minimisation is an appropriate strategy to address the problems of industrial pollution. The objective of the scheme is to assist the small and medium scale industries in adoption of cleaner production processes.**

- A scheme on adoption of clean technology and promotion and establishment of waste minimization circles in small and medium scale industries is being implemented at the initiative of Ministry of Environment & Forests.
- So far, 118 waste Minimisation Circles have been established in 41 sectors in 17 geographic locations in the country.
- A “Waste Minimization Circle (WMC)” is a small group (5 to 7 units) of entrepreneurs in the small scale sector, whose units manufacture similar products and employ the same processes voluntarily meeting periodically and regularly in the premises of each member unit, one after another, to analyze the current operations of the host unit, to



# CLEAN TECHNOLOGY

Adoption of Cleaner Technologies and cleaner production strategies is considered to provide a balance between Development and Environment. Cleaner production is one of the tools which has a lot of bearing on environmental pollution control. It is seen that the approach is changing with time i.e. dumping-to-control-to-recycling-to-prevention.



The scheme on development and promotion of Clean Technology was initiated in 1994 with the following objectives:

- *Development & Promotion of Cleaner Technologies.*
- *Development of tools and techniques for pollution prevention.*
- *Formulation of Sustainable Development Strategies*
- *Clean Technologies, as distinct from “end-of-pipe” abatement technologies minimize the generation of waste streams in the production processes and utilize waste from other consumption goods and production processes, rather than treating the waste after generation.*
- *Clean technologies are less intensive in use of raw materials and energy than conventional technologies, which rely on pollution abatement after generation. For this reason, they may also offer significant cost advantages to the producer.*

# COMPREHENSIVE ENVIRONMENTAL POLLUTION INDEX

- The Government of India has recently carried out an environmental assessment of industrial clusters across the country based on Comprehensive Environmental Pollution Index (CEPI) with the aim of identifying polluted industrial clusters and prioritizing planning needs for intervention to improve the quality of environment in these industrial clusters and the nation as a whole.
- CEPI is a descriptive index of pollution. It is a rational number between 0 and 100, assigned to characterize the environmental quality at a given location. In all 88 industrial clusters have been assessed.
- The report has identified 43 industrial clusters/areas having aggregated CEPI scores of 70 and above as critically polluted, which need further detailed investigations in terms of the extent of damage and formulation of appropriate remedial action plans.
- 32 clusters/areas having CEPI scores between 60-70 have been identified as severely polluted areas to be kept under surveillance and pollution control measures to be efficiently implemented.
- The Government has imposed a temporary moratorium on 13.01.2010 on consideration of development projects in critically polluted industrial cluster/areas including the projects in pipeline for clearance with immediate effect till October 2010.

# SCHEME OF COMMON EFFLUENT TREATMENT PLANTS

Common Effluent Treatment Plants (CETPs) are not only one of the best alternatives for the prevention and control of pollution in the small-scale industrial units but also facilitate for easy monitoring by the regulatory authorities. It is the concept of treating effluents by means of a collective effort mainly for a cluster of compatible small scale industrial units.

- *Under the Water (Prevention and Control of Pollution) Act 1974, every industry has to provide adequate treatment of its effluents before disposal whether it is in stream, land, sewerage system or in sea.*
- *A Centrally Sponsored Scheme of CETPs is being implemented for enabling the small scale industries (SSI) to set up new and upgrade the existing CETPs to cover all the States in the country.*



# The main objectives of a CETP are:

- to reduce the treatment cost for individual units while protecting the environment.
- to achieve 'Economics of scale' in waste treatment, thereby reducing the cost of pollution abatement for individual factory.
- to minimise the problem of lack of technical assistance and trained personnel as fewer plants require fewer people.
- to solve the problem of lack of space as the centralized facility can be planned in advance to ensure that adequate space is available.
- to reduce the problems of monitoring for the pollution control boards. to organize the disposal of treated wastes and sludge and to improve the recycling and reuse possibilities.



# Current Status & Emerging Trends

- Municipal Solid Waste Management
- Plastic Waste Management
- Packaging Waste Management
- E-waste Management
- Hazardous Waste Management

*Together with constraints*

# MUNICIPAL SOLID WASTE MANAGEMENT – Present scenario

- **Urban solid waste management has remained one of the challenging areas of urban management in India with respect to collection and disposal of household waste.**



- The MSW generation in the country has been estimated to be 0.573 (MMT/d) in the year 2008.
- The average collection efficiency of municipal solid waste ranges from 22% to 60%. The waste characterization showed that municipal solid wastes typically contains 51 % of organic waste, 17% recyclables, 11% hazardous and 21% inert.
- About 40% of all MSW is not collected at all and hence lies littered in the city/town and finds its way to nearby drains and water bodies, causing choking of drains and pollution of surface water.
- **The Municipal Solid Wastes (Management and Handling) Rules, 2000 were notified by the Ministry of Environment and Forests for management of Municipal Solid Wastes.**



## Constraints

- MSWM Rules are not being effectively implemented in most of the local bodies.
- Surface and manual disposal of wastes is the most widely practiced system of waste disposal in Indian cities. Lack of an established system for segregation of recyclable, organic and inorganic wastes at household level ,collection, transportation, treatment, disposal and complete networking of the system is the major drawback in the proper management of waste.
- Where it has been possible to establish a waste management system, these are not operated and maintained properly. The reasons for poor operation and maintenance include the following:
  - a. Inadequate finances;
  - b. Overburdening of the local bodies responsible for proper disposal of urban waste;
  - b. Multiplicity of agencies for operation and maintenance;
  - c. Inadequate training of personnel;
  - d. Lack of performance monitoring;
  - e. Inadequate emphasis on preventive maintenance;
  - f. Lack of management

# PLASTIC WASTE MANAGEMENT - Present Scenario

Plastics waste has attracted widespread attention in India, particularly due to the indiscriminate littering on open land, drains, rivers, coasts, landfill-sites etc.

- The plastic consumption in India, as per estimate in 2008 was 8 MT/annum, out of which about 5.7 MT of plastics are converted into waste annually i.e. 15,722 tons of plastic waste is generated per day. Therefore, the per capita generation of plastic waste has been estimated as 5.7 Kg/annum.
- Approximately, 6300 tons per day (TPD) i.e. 40% of plastics are neither collected, nor recycled. These in turn, choke drains or get dredged in the soil, making the land infertile.
- *India notified the Recycled Plastics Manufacture and Usage Rules, 1999 (as amended in 2003) prohibiting the use of recycled plastic bags for storing, carrying, dispensing or packaging foodstuff. These rules also provide that minimum thickness of bags should be 20 microns and the size should not be less than 8" x 12".*



## Constraints

- The management of rising quantum of waste, lack of responsible stakeholders for plastic waste management, the challenge of biodegradable plastics and the existing practices of plastic recycling are all issues of great concern.
- Plastic recycling in India is carried out in small, unauthorized units reprocessing thousands of tons of thermoplastics in a completely unregulated manner leading to the manufacture of highly contaminated and hazardous plastic products.
- Contaminants get into plastics through addition of poor quality dyes and plasticizers during reprocessing of post consumer plastics under very poor conditions. Most of these substances, which are carcinogenic and toxic, cause immense damage to human health and the environment.
- At present there is no focus on assigning responsibility and accountability at the implementation levels. Agencies are working in isolation and in an arbitrary and haphazard manner, which is evident from the fact that each State has adopted different mechanisms for dealing with the plastic waste management issue.

# Packaging Waste Management - Present Scenario

Packaging, as a strategic business tool, is the key for enhancing product characteristics and safety of the product. Packaging waste, its collection and disposal have become an environmental challenge.

- Packaging waste comprise a wide range of materials that are derived from multiple items used as packaging material.
- Selection of appropriate waste characterization and processing technologies can tell us about the composition of waste.
- Packaging, especially food packaging has considerable impact on health and environment. Styrofoam or Polystyrene (PS), Polyvinyl chrolide (PVC), Polypropylene (PP), Polyetylene Terapthalate (PET) and several others are reported to be unsafe as food and beverage packaging.
- Presently, the packaging material waste is being managed along with Municipal Solid Waste.



# Constraints

- The thermoplastics like HDPE, LDPE, PVC, PP, PS, PET or any of the thermosets are not bio-degradable.
- Fused Aluminum and plastic are used for packaging food materials. PolyAl is completely non-degradable and emit toxic fumes on burning
- The non-food packaging make up almost 80-90% of packaging by weight and its quantity is rising day by day. Despite organized collection, recycling etc., huge quantities are sent to the landfills and dumpsites which create major constraints in availability of land and other resources. They are also a major cause of pollution when burnt or incinerated.
- Food and Beverages packaging are high volume but may have low weights, making up only 15-20% of all packaging. They are flimsy and disposable and highly visible since they are directly disposed in the environment and are found scattered everywhere.

# E- WASTE MANAGEMENT



**Help keep electronic waste from growing.**

# E- WASTE MANAGEMENT - Present Scenario

- The electrical and electronic waste (e-waste) is one of the fastest growing waste streams in the world. The increasing “market penetration” in developing countries, “replacement market” in developed countries and “high obsolescence rate” make e-waste as one of the fastest growing waste streams in the world.
- Improper disposal of e waste causes huge hazards to health as well as the environment and hence is a matter of grave concern.
- The increase of electrical and electronic products consumption rates and higher obsolescence rate leads to higher generation of e-waste.
- The increasing obsolescence rate of electronic products also adds to the huge import of used electronics products.
- The E-waste inventory based on the obsolescence rate in India for the year 2005 has been estimated to be 1,46, 000 tonnes, which is expected to exceed 8,00,000 tonnes by 2012.
- Recognising the fact that e-waste is seen as a major future problem, guidelines for “Environmentally Sound Management of E-waste” have been brought out by India suggesting treatment options and adoption of environmentally sound e-waste treatment technologies.
- The objective of these Guidelines is to provide guidance for identification of various sources of waste electrical and electronic equipments and prescribed procedures for handling e-waste in an environmentally sound manner.
- These Guidelines apply to all those who handle e-waste which includes the generators, collectors, transporters, dismantlers, recyclers and stakeholders of e-wastes irrespective of their scale of operation.
- Since e-waste or its constituents fall under the category of ‘hazardous’ and “non hazardous waste”, they are covered under the purview of “The Hazardous Waste Management Rules, 2003”.

# HAZARDOUS WASTE MANAGEMENT - Present Scenario

- Ministry of Environment and Forests has notified the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 repealing earlier rules so as to make the Rules more practical and effective in implementation.
- Every occupier generating hazardous wastes as listed in the said Rules or Operator of a Common Hazardous Waste Treatment, Storage and Disposal Facility (TSDF) requires authorization for collection, reception, treatment, storage, transportation and disposal of hazardous wastes



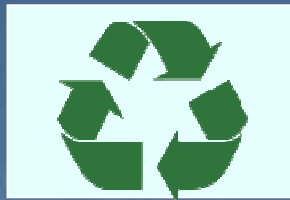
- In order to speed up the process of development of TSDF in the States, MoEF has a comprehensive scheme to provide financial assistance for setting up of TSDF for the State Governments and the industry associations.
- MoEF provides financial assistance maximum of Rs. 20 million for setting up of TSDF on Public-Private Partnership basis based on Build, Operate and Own (BOO) principle, in accordance with the provisions of Hazardous Waste Management (HWM) Rules.



## Constraints

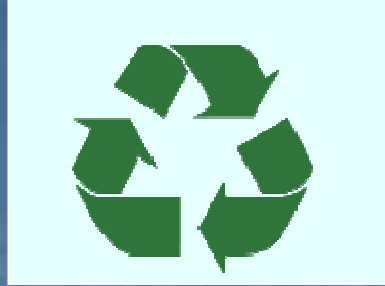
- There are about 36,000 hazardous waste generating industries in India which generate 6.2 million tonnes out of which land fillable hazardous waste is about 2.7 million tonnes (44%), incinerable hazardous waste is about 0.4 million tonnes (7 %) and recyclable hazardous waste is about 3.1 million tonnes (49 %).
- Indiscriminate and unscientific disposal of wastes in the past has resulted in several sites in the country to become environmentally degraded. There are 141 hazardous waste dumpsites that have been primarily identified in 14 States
- As per the National Inventory of Hazardous Waste Generating Industries, total waste handling capacities of TSDFs is about 1.5 MTA and there is a deficit of about 1.2 MTA for land fillable wastes and about 0.9 MTA for incinerable wastes.

# Conclusions & Recommendations



The **Performance Audit Report on Management of Waste in India** submitted by the office of the Comptroller and Auditor General (CAG) in September 2008, surmised that the waste management hierarchy needs to be emphasized in our policies and summarized its observations on the current waste management situation in the country into seven important requirements for improvement.

- *assessing the quantum of waste being generated and its impact on environment and health,*
- *formulating policies and strategies towards prioritizing waste reduction and minimization rather than mere disposal,*
- *promulgating legislations specifically dealing with disposal of each kind of waste incorporating penalty for violation,*
- *assigning clear responsibility and accountability to various agencies involved in the process of waste management,*
- *enforcing compliance to rules regulating municipal solid wastes, biomedical wastes and plastic wastes,*
- *monitoring to check non-compliance,*
- *providing funding and manpower for the implementation of rules on waste management.*



In addition to specific legislations, strict enforcement is being ensured with the following provisions through the state authorities :

- *A manifest system to track the waste from the point of generation to disposal.*
- *A need for seeking authorization for handling of waste*
- *Registration of recyclers*
- *Involvement and participation of the public in schemes*
- *The import and export of both hazardous waste and non industrial waste stipulated for recycling are regulated and require licenses granted by the Ministry of Commerce.*

*There are several ways in which government can attempt to overcome the abovementioned barriers and actively encourage industrial waste minimization activities.*

*These include*

- the provision of technical assistance programs,
- the creation and enforcement of pollution control regulations,
- the dissemination of information about waste minimization programs and opportunities,
- the establishment of financial incentives,
- the foundation of award programs recognizing significant achievements in waste minimization.

*A wide range of activities could be supported in an information dissemination program,*

- education and training activities,
- the creation of a waste exchange,
- the distribution of technical information bulletins.

*Financial support for capital expenditures on waste minimization equipment can include*

- matching grants,
- subsidies,
- low or no-interest loans,
- tax deductions,
- tax credits.

**The success of a '3R' initiative will largely depend on the right mix of policies and programmes implemented at the local level. Much of this will also depend on developing an integrated framework bringing together the above points with other issues, including**

- **Investment policies and practices, such as greener procurement, subsidies and ecotaxes etc;**
- **Production policies and practices, such as integrated product policy, life cycle assessment, extended producer responsibility, precautionary principle, polluter pays principle, eco-efficiency/ clean production, health and safety standards etc.;**
- **Distribution policies and practices, such as right to know, advertising reform, ecolabeling, packaging, pricing, transportation etc. and**
- **Consumption policies and practices, such as consumer values, norms and behavior and awareness and education.**

***“THE EARTH PROVIDES ENOUGH TO  
SATISFY EVERYMAN’S NEED BUT  
NOT FOR EVERY MAN’S GREED”***

***– Mahatma Gandhi.***





PLEASE  
HANDLE WITH CARE

**FRAGILE**

\*\*THANK YOU\*\*