Environment Audit Report

Report of the Comptroller and Auditor General of India, No.17 of 2010-11
Plan of the presentation

- About the Report
- About Ministry of Environment and Forests
- Theme: Afforestation
- Theme: Biodiversity
- Theme: Pollution Control
- Theme Environment Education
- Response to audit
About the report

• Degradation of environment in India due to
  – Overutilization of natural resources for meeting development needs
  – Rapid industrialization and urbanization
  – Dumping of wastes on land and water bodies

• Trends towards degradation can be slowed and even reversed by active governmental interventions

• The objective of this report is to create awareness and urgency about conservation and protection of the environment which needs to be addressed by the government
About the report

• This is the first time that CAG has brought out a separate Audit Report on MoEF... provides a holistic picture of the performance of MoEF

• Audit findings have been discussed under 4 major activities:
  – afforestation, biodiversity, pollution control & environment education

• Report also contains 37 specific recommendations
  – to enable the executive to improve environmental governance in India
About Ministry of Environment & Forests

- The objectives of the Ministry of Environment and Forests (MoEF) are:
  - Conservation and survey of flora, fauna, forests and wildlife
  - Prevention and control of pollution
  - Afforestation and regeneration of degraded areas
  - Protection of the environment &
  - Ensuring the welfare of animals

- MoEF is headquartered in Delhi & has 77 units across the country

- Expenditure of MoEF was ₹1711.29 crore in 2008-09 against ₹1036.19 in 2003-04
About MoEF

• MoEF plans, promotes, coordinates and oversees the implementation of environmental/forestry programmes

• MoEF also implements rules/regulations like:
  – The Air (Prevention and Control of Pollution) Act (1981)
  – The Environment (Protection) Act (1986)
  – Wildlife (Protection) Act (1972)
  – The Forest Conservation Act (1980) etc.,
General areas of concern

• Non-achievement of objectives
  – There were many programmes which were undertaken by MoEF which could not achieve the objectives for which they were undertaken
  – Pointed out on paragraphs on pollution control, afforestation, biodiversity & environmental education

• Lack of monitoring by MoEF
  – Monitoring of projects was inadequate and this hampered the overall effectiveness of implementation of projects/schemes
  – Brought out in Paragraphs on afforestation and pollution control
  – Pendency of Utilisation Certificates worth ₹597 crore from upto 1981-82 also points to weaknesses in monitoring
General areas of concern

• Lack of manpower
  – We also observed that lack of trained manpower, scientists etc., was a major constraint in implementation of programs and fulfillment of objectives
  – This has been specially brought out on the paragraph on BSI

• Delay in framing regulations
  – Environmental regulation is essential to conserve natural resources and prevent their depletion. However, it has been noticed, specially in the case of NBA, that MoEF has been delaying framing of regulation, which will result in adverse impact on the environment
Forests are critically important habitats due to the ecological functions they serve and the biodiversity they contain. The total forest cover of the country is 21.02% which is planned to be increased to 33%.
Failure of a scheme for increasing tree cover (Paragraph 2.1)

- National Afforestation & Eco-development Board (NAEB) released ₹47.03 crore to Voluntary Agencies (NGOs etc), etc during 2003-08 for implementing 647 afforestation projects
  - Only 3.6% of the projects sanctioned to NGOs were completed
  - Possibility of misutilisation/fraud cannot be ruled out as most NGOs took the 1st installment and did not come back for the 2nd and 3rd installments

- MoEF stated that they had filed FIRs against only some defaulting NGOs
Failure of a scheme for increasing tree cover (Paragraph 2.1)

- Mid term evaluation of the scheme by another agency reported misappropriation of funds by many NGOs
- More than 93% of the projects for tree planting and production of quality planting material did not achieve their targeted objectives
  - thereby seriously impacting the efforts to increase tree cover in India
Biodiversity is the degree of variation of life forms within a given ecosystem. India with 2.4% of land area of the world...but contributes 8% of global biodiversity. At least 10% of the country's wild flora & fauna are on the threatened list and many on the verge of extinction.
Regulation of Biodiversity in India

• National Biodiversity Authority set up in Chennai in 2003 for the regulation & conservation and sustainable use of bio-resources of India

• Even 6 years after its formation, NBA could not notify important regulations for conservation of biodiversity like:
  – access to biodiversity
  – transfer of results of research
  – intellectual property rights
Regulation of Biodiversity in India

- Lists of endangered medicinal plants in India and measures for their conservation not drawn up
- List of endangered species prepared for only 7 out of 28 states
- Biodiversity Management Committees created in only 12% local bodies
- No information on grant of IPRs outside India on any biological resource/knowledge obtained from India
Role of BSI in meeting India’s commitments to the Convention on Biological Diversity

• To implement provisions of CBD which was ratified by India in 1994, objectives of Botanical Survey of India were remodelled
  – There was inadequate identification/documentation & monitoring of endangered/threatened plant species
  – Very few surveys & explorations carried out to identify/document endangered species in protected areas, hotspots, fragile ecosystems and sacred groves
Role of BSI in meeting India’s commitments to the Convention on Biological Diversity

- The Red Data Book (having list of threatened species) last updated only in 2003

• Thus, BSI could not effectively fulfil its role in meeting India's commitment to CBD
While artificial chemicals have improved the quality of life around the world, their disposal has also posed a threat to the health of humans and wildlife. Pollution control is regulated by various environmental agencies that establish limits for the discharge of pollutants into the air, water and land.
Non-achievement of objectives of Ecocity Programme

- CPCB started Ecocity Programme at cost of ₹30 crore under X Plan for implementation in 6 cities of cultural/tourism importance
  - Objectives was to improve environment through environmental improvement projects
  - Cities selected in 1st phase were Ujjain, Puri, Tirupati, Kottayam, Vrindavan & Thanjavur
Non-achievement of objectives of Ecocity Programme

- Works undertaken remained incomplete in all 6 cities and ₹1.88 crore was lying unspent with SPCB for over 7 years.
- 2nd phase of the project, which was to be built on successes of 1st phase, not yet initiated.
Non-achievement of objectives of control of pollution caused by leather tanneries

- NRCD sanctioned loan of ₹67.72 crore to Government of West Bengal for construction of Common Effluent Treatment Plant at Bantala, Kolkata.
  - NRCD has sanctioned only 4 out of 7 components of the project till end of 2009.
  - The project was targeted for completion by November 1997 but could not be completed as of June 2010; a delay of more than 12 years.
  - Only 15 out of 30 mld waste water was reaching the CETP from around 250 tanneries operating in CLC.
  - Major portion of the effluent either percolating to the ground water or creating cesspools of polluted water.
Non-achievement of objectives of control of pollution caused by leather tanneries

- Analysis report revealed that levels of TSS (total suspended solids), COD (Chemical Oxygen Demand), BOD (Biological Oxygen Demand), Cr (hexavalent chromium, a carcinogen) were much higher than the prescribed limits.

- The solid wastes which were chromium bearing residue & sludge, might also leach & contaminate the ground water & create water pollution.

- Thus the project failed to achieve the objective of safe disposal of waste from tanneries causing immense damage to environment.
In India, environment education is imparted through methods like infusion of environmental concepts in the textbooks at the school/college level, Natural History Museums, programmes like National Environment Awareness Campaign, National Green Corps etc.
Activities of National Museum of Natural History, New Delhi

- Former Prime Minister Smt Indira Gandhi, in 1972 decided that India needed a museum of Natural History to depict:
  - flora, fauna & mineral wealth
  - to provide an out of school facility for education of children
  - to promote environmental awareness for masses
- NMNH opened temporarily in the FICCI building in 1978 in Delhi and still continues there
Activities of National Museum of Natural History, New Delhi

• Audit observed that:
  – NMNH had old & archaic collections and galleries/exhibits had not changed/updated in the last 20 years
  – Galleries not maintained according to good standards and visitors had a very poor comments about NMNH
  – Efforts to reach out to children to educate them about environment/conservation extremely limited
Activities of National Museum of Natural History, New Delhi

- No guides/multimedia devices to enrich experience of visitors
- Museum was not disabled-friendly and was still functioning from the rented building even after 32 years

• Did not justify status of being a ‘national museum’ due to poor quality of exhibits and amateurish efforts in the field of promoting environmental education……did not fulfill the vision of the former PM
Response to audit

• Widely reported in press
• Discussed in Public Accounts Committee
  – Committee anguished to note that indiscriminate exploitation of natural resources for meeting ever increasing developmental needs coupled with the uncontrolled growth of urbanization, industrialization and population explosion is adversely impacting our environment
  – Dumping of industrial wastes into our rivers and lakes, clearing forest lands for agricultural activities along with the increased emission of harmful pollutants into the atmosphere, have all contributed to the environmental degradation.
Response to audit

- It is in this context that Government of India put in place institutional measures and schemes for promotion of afforestation, conservation of biodiversity, pollution control and environmental awareness/education.

- Committee notes serious deficiencies and inadequacies as pointed out by the C&AG in the implementation of environmental programmes and in the functioning of various institutions working under MoEF
  - recommendations made by PAC
Thank you
Management of Waste in India
SAI India

SAI India
Plan of presentation

- What is waste
- What is waste management: INTOSAI WGEA
- Why waste management issues are important: INTOSAI WGEA
- International perspectives about waste
- Case study: Management of waste in India
  - Why we chose this topic
  - Planning for audit: Framework for management of waste in India
  - Audit scope/methodology/sampling
  - Audit objectives
  - Audit criteria
  - Audit reporting
  - Audit findings
  - Audit impact
What is waste

- The actual definition varies from country to country
  - Most legal definitions of waste can be summarized as a product or a substance that is no longer suited for its intended use
- According to the Basel Convention, wastes are substances or objects which are disposed or are intended to be disposed or are required to be disposed off by national laws
Kinds of waste

▪ Hazardous
  ▪ pose a threat to human health and the environment if it is not handled properly
  ▪ For this reason, many countries have strict regulations governing the storage, collection and treatment of hazardous waste
    ▪ Much hazardous waste originates from industrial production.
    ▪ Industrial waste, biomedical waste, Electronic and electrical equipment (EE waste)
▪ Non hazardous
  ▪ All waste not included in hazardous category
  ▪ Solid waste: from cities
Health/environmental hazards caused by waste

1. Surface water contamination
   - Takes place when the wastes reach water bodies
   - Pollution of rivers, lakes and ground water

2. Ground water contamination
   - Takes place when residues from waste, leach into the ground water
   - A specific environmental hazard caused by waste is leachate which is the liquid that forms as water trickles through contaminated areas leaching out the chemicals
   - Movement of leachate from landfills, effluent treating plants and waste disposal sites may result in hazardous substances entering surface water, ground water or soil
3. **Soil contamination:**
   - Caused by dumping of waste
   - Waste can harm plants and can indirectly adversely impact the health of humans and animals

4. **Air contamination**
   - Caused by emissions from incinerators, other waste burning devices & from landfills
   - Dioxins, furans & polychlorinated by-phenyls (PCB), are deadly toxins, causing cancer & endocrine system damage
   - Mercury, heavy metals
   - Green house gases: from landfills
Waste management

‘Waste management’ shall mean “the collection, transport, recovery and disposal of waste, including the supervision of such operations and aftercare of disposal sites”

..........European Union Directive on waste

However the newer concepts of ‘Waste management’ talk about ‘Reduce, Reuse and Recycle of waste’ over and above waste disposal
Waste management hierarchy

1. Prevention
2. Minimisation
3. Reuse
4. Recycling
5. Energy recovery
6. Disposal
International awareness regarding waste

- At the 1992 Rio Conference, waste was made one of the priorities of Agenda 21
  - Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally and was adopted by more than 178 Governments at the UN Conference in Rio de Janeiro
- At the Johannesburg World Summit on Sustainable Development in 2002, the focus was on
  - Initiatives to accelerate the shift to sustainable consumption and production, reduction of resource degradation, pollution and waste
Implementation plan adopted by the Summit, stated the priority to:

- “Prevent and minimize waste & maximize reuse, recycling & use of environmentally friendly alternative materials, with the participation of government authorities
- all stakeholders to minimize adverse effects on the environment and improve resource efficiency, with financial, technical and other assistance for developing countries.”
- This would include actions at all levels to:
  - Develop waste management systems, with the highest priority placed on waste prevention and minimization, reuse and recycling, and environmentally sound disposal facilities, including technology to recapture the energy contained in waste
  - Promote waste prevention and minimization by encouraging production of reusable consumer goods and biodegradable products
Agreements for nonhazardous/ solid waste

- London convention on Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1975
  - Entered into force in 1975
  - Objective: is to prevent pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea

- The MARPOL Convention for the Prevention of Pollution from Ships, 1978
  - Main international convention covering prevention of pollution of marine environment by ships from operational or accidental causes
Agreements for nonhazardous/solid waste

- **Basel convention**
  - Convention was principally devoted to setting up a framework for controlling the transboundary movements of hazardous waste, that is, the movement of hazardous waste across international frontiers
  - It developed criteria for "environmentally sound management"
- **The Basel Convention has links with regional hazardous waste regimes, in particular**
  - the 1991 Bamako Convention (which came into force in 1998)
  - The 1995 Waigani Convention (which came into force in 2001)
Agreements regulating radioactive waste

- Radioactive waste is in an exceptional position, can be fatal if not handled properly
  - No widely endorsed convention that explicitly addresses the issue of nuclear waste.
- More states have ratified the general convention that states precautionary principles regarding nuclear management
- Joint Convention
  - The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management the first legal instrument to address these issues directly on a global scale, Entered into force on 18 June 2001
- Convention on Nuclear Safety
  - Global agreement that was adopted in Vienna in 1994
  - Aim is to legally commit participating states that operate land-based nuclear power plants to maintain a high level of safety by setting international benchmarks to which states would subscribe
“Management of Waste in India”
Case study
Why we chose this topic

- Developing countries like India: massive migration of their population from rural to urban centers
  - New consumption patterns, production techniques and expansion of human activity: contributed to increase in all kinds of waste
  - No strategies/laws/rules which encourage reuse, recycle and reduction. Inaccurate estimates of waste produced in India
  - Health/environment hazards caused by waste not addressed
Lack of Waste data

- Some data about:
  - urban solid waste, hazardous waste, bio medical waste, E waste
  - Even this data is not complete
- No estimates or even ball park figures exist for
  - construction and demolition waste
  - packaging waste
  - mining waste
  - waste from end-of-life vehicles and tyres
  - agricultural and forestry waste
- Impact on health and environment
Planning for audit

- Collection of background information
  - From various stakeholders like Non governmental organisations, ministry (implementers), regulator etc.
  - Performance Reports of the Ministry of Environment and Forests which is the main agency for control of pollution in India
  - Agenda 21
  - INTOSAI guidelines on Waste
Planning for audit

- Institutional framework for management of waste in India
  - Rules and acts governing management of waste in India
    - Municipal Solid Wastes (Management and Handling) Rules
    - The Bio-Medical Waste (Management and Handling) Rules
    - The Recycled Plastics Manufacture and Usage Rules
    - Hazardous Waste Management Rules
    - Batteries Management & Handling Rules
  - Policy making agencies: federal (MoEF), states
  - Implementing agencies: local level agencies
  - Monitoring agencies: federal & provincial level agencies
Planning for audit

- Traditional Reviews/PAs on environment or pollution have mainly touched on implementation of rules in water, solid waste and air
  - In this PA we decided to address implementation & monitoring of rules as only 2 of the 7 objectives of the PA
  - Emphasis of the PA (6 of the 7 objectives) Planning, data collection & analysis on waste, policy making, rule making, ownership of responsibility to waste and ownership of responsibility to environment
Deciding audit scope

We consulted/used the following while framing audit objectives and our guidelines:

- International best practices in waste management (EU, Japan, US, Australia)
- INTOSAI guidelines on conduct of audit on waste management
- An International training programme on environment attended by 30 countries
- Discussions with NGOs working in the area of waste like ‘toxics link’ and ‘CSE’
- MoEF and CPCB
Audit scope

- Scope of this PA to include
  - Adequacy of data on waste and risk assessment,
  - Existence of policy/legislations,
  - Ownership of responsibility to waste and ownership of responsibility to environment,
  - Gaps in accountability
  - Problems in compliance with rules
  - Effectiveness of monitoring
- Relating to municipal solid waste, hospital waste and plastic waste
Audit sampling

- Audit took place simultaneously all over 24 states in India as well as the central level
- More than 300 audit personnel involved in actual audit
- Statistical sampling (stratified random sampling) was used to select samples.
  - Audit of policy, planning and legislation regarding management of wastes at MoEF/CPCB; coordinated by the Office of Principal Director of Audit (SD).
  - 24 states were sampled: policy and data issues
  - 56 municipalities in 20 states: implementation of Municipal Solid Waste rules
  - 180 hospitals in 15 states: implementation of Biomedical Waste rules
  - 60 districts in 20 states: implementation of Plastic Waste rules
Audit methodology

- Detailed guidelines were prepared agency wise
- Document analysis, site visits, Responses to questionnaires
- Testing report and photographs also used
- Results were compiled at the central level
Audit objectives

Objective 1:
Whether quantum of waste being generated in the country had been assessed and risks to environment/health posed by waste been identified;

Objective 2:
Whether a specific policy for management of wastes existed and whether policies and strategies for the management of waste gave priority to waste reduction and waste minimization as against waste disposal;

Objective 3:
Whether legislations specifically dealing with disposal of each kind of waste existed and whether penalty for violation had been incorporated in the legislations already enacted;
Audit objectives

**Objective 4:**
Whether various agencies involved in the process had been allocated clear responsibility and accountability for waste management and whether or not a mismatch/gap/overlap existed among the responsibility centers;

**Objective 5:**
Whether effective compliance to laws regulating municipal solid waste, biomedical waste and plastic waste was taking place in the states;

**Objective 6:**
Whether monitoring was effective in checking non compliance; and

**Objective 7:**
Whether funding and manpower were adequate for the implementation of rules on waste management and whether the funds/infrastructure were used economically, efficiently and effectively.
Audit criteria

- International criteria from bodies like
- United Nations Environment Program,
- World Commission on Sustainable Development (Agenda 21) were used to judge performance
- Available rules, policy frameworks framed by the Ministry of Environment and Forests etc.
Audit reporting

- Apart from audit findings/conclusions, exhaustive recommendations for each objective have also been suggested.
- Practices in waste management all over the world have also been quoted to show the range of activities possible.

Audit Findings

- **Objective 1:** Whether quantum of waste being generated in the country had been assessed and risks to environment/health posed by waste been identified;

- **Objective 2:** Whether a specific policy for management of wastes existed and whether policies and strategies for the management of waste gave priority to waste reduction and waste minimization as against waste disposal;

- **Objective 3:** Whether legislations specifically dealing with disposal of each kind of waste existed and whether penalty for violation had been incorporated in the legislations already enacted;
Audit findings

- **Objective 4**: Whether various agencies involved in the process had been allocated clear responsibility and accountability for waste management and whether or not a mismatch/gap/overlap existed among the responsibility centers;

- **Objective 5**: Whether effective compliance to laws regulating municipal solid waste, bio-medical waste and plastic waste was taking place in the states;

- **Objective 6**: Whether monitoring was effective in checking non compliance; and

- **Objective 7**: Whether funding and manpower were adequate for the implementation of rules on waste management and whether the funds/infrastructure were used economically, efficiently and effectively.
Audit findings to Objective 1

- MoEF/states had not completely assessed the quantity of various kinds of waste
  - No data in 42 per cent of the sampled states
- MoEF had no projections about amounts of waste that might be produced in future
  - Only 25 per cent had made projections about the growth in waste.
- MoEF/CPCB had not completely assessed the risks to environment and health posed by waste
  - only 25 per cent had assessed these risks; that too, partially
Audit recommendations to Objective 1

- CPCB, should carry out, periodically, a comprehensive assessment of the amounts of waste being generated, according to the major waste types

- MoEF/states may collect data about growth of the various kinds of waste, analyse the factors contributing to its growth and the increase in waste quantities to arrive at strategies for waste management

- MoEF/CPCB/states, may estimate the current capacity to handle all kinds of waste all over the country and ensure that additional capacity of waste infrastructure, if required, is created for safe disposal

- MoEF/ states may also carry out regular surveillance, including epidemiological surveillance of waste related impacts on public health
Audit findings to Objective 2

- No specific waste management policy in India
- Rules focus only on disposal strategies and do not encourage reuse, recycling and prevention
  - No effective strategies to implement the 3 R’s (recycle, reduce and reuse)
- MoEF had not adequately addressed the role of informal sector in handling waste and in the states
Audit recommendations to Objective 2

- MoEF may consider framing a specific policy for the management of wastes in India, incorporating the internationally accepted hierarchy for management of wastes in the policy.

- MoEF should consider the introduction of Environmentally Preferred Purchases and lay down guidelines for the purchase of recycled products to promote the purchase of eco friendly goods by the government and the agencies controlled by it.

- MoEF should include more products under the “ECOMARK” label and monitor adherence to environmental standards of these products.
  - It should also prescribe standards for classifying products as environmentally friendly and carry out environmental impact studies of such products.
Audit findings to Objective 3

- Laws not framed for all kinds of waste, leaving the safe disposal of many kinds of waste like construction and demolition waste, agricultural waste, e-waste etc., unmonitored

- Polluters were not being effectively held responsible for unsafe disposal, thereby creating no deterrence for non-implementation of the rules
  - Only in 25 per cent of the sampled states, some token action (like filing of cases against hospitals, sending notices to municipalities) had been taken by PCB/government against defaulters for illegal dumping of waste
Audit recommendations to Objective 3

- MoEF should consider framing laws/rules for the management of all major kinds of waste like
  - construction & demolition waste, end of life vehicles, packaging waste, mining waste, agriculture waste and e-waste being generated in the country to promote safe disposal

- As imposition of penalty under EPA for the violation of waste rules is infrequent, MoEF should consider incorporating punishment/penalty as well as responsibility of the polluter in the specific rules governing management of each kind of waste so that there is a strong deterrent for violation of the rules.
Audit findings to Objective 4

- No single body taking ownership of waste issues at central/state level, leading to dispersal of responsibility and weak accountability
  - Only 15 per cent constituted the Solid Waste Mission for implementation of municipal solid waste rules
  - Advisory committees to advise the state governments on the implementation of bio-medical waste rules were set up only in 47 per cent of the sampled states
- There was no clear identification of bodies for monitoring of waste rules at the centre as none of the four central ministries, i.e.
  - MoEF, Ministry of Urban Development, Ministry of Health and Family Welfare and Department of Petrochemicals took responsibility for monitoring of municipal solid waste, bio-medical waste rules and plastic waste rules
Audit recommendations to Objective 4

- Since waste causes pollution and pollution issues are necessarily the responsibility of MoEF, the Central Government should consider appointing MoEF as the nodal body for all kinds of waste.

- Solid Waste Mission for municipal solid waste and Advisory Body for bio-medical waste should be set up in all the states for dealing with overall issues related to implementation of rules at the state level.
Audit findings to Objective 5

- Poor Compliance to Municipal Solid Waste rules
  - Segregation, collection, disposal, energy recovery not taking place

- Very low compliance to biomedical waster rules
  - Labelling, segregation. Disposal not taking place as per rules

- Very poor compliance to plastic waste rules
Audit Recommendations to Objective 5

▪ Municipal solid waste
  ▪ MoEF/states should draw up a time-bound plan for setting up of waste processing and waste disposal facilities

▪ Biomedical waste
  ▪ Registrations of those hospitals that do not set up treatment/disposal facility or join a common facility could be cancelled.
  ▪ New hospitals should not be allowed to commence treatment without making sure that it has a facility for treatment/disposal of bio-medical waste

▪ Plastic waste
  ▪ The rules should be amended to include the specific actions to be taken by the DCs/DMs for the enforcement of the plastic waste rules.
  ▪ Surprise checks should be conducted to verify whether vendors were following the provisions of the plastic waste rules
Audit findings to Objective 6

- Monitoring of the municipal solid waste rules, bio-medical waste rules and plastic rules, at the central level, not effective
  - Systems were not in place to check non-compliance of rules by municipalities, hospitals and district authorities.
  - Monitoring by state governments was taking place only in 11 per cent of the municipalities
  - Only 13 per cent of sampled hospitals were being monitored for compliance to bio-medical waste rules
  - Only in 20 per cent of the sampled states, the DCs of the district were monitoring the implementation of plastic rules
Audit recommendations to Objective 6

- At the central level, MoEF/CPCB and at the level of the states, the PCBs should draw up a schedule of monitoring of municipalities and hospitals and monitor them not less than once in 6 months.

- Regular monitoring of waste disposal facilities like compost plants, incinerators etc should be done by CPCB/PCBs.
Audit findings to Objective 7

▪ Funds were not utilised efficiently and economically
  ▪ *Chhattisgarh* diverted Rs. 60 lakh for the construction of drainage and mini stadium, though funds were released for management of municipal solid waste.
  ▪ *Karnataka* diverted Rs. 17.44 crore for purposes such as street lighting, road work etc.,
  ▪ Instead of utilizing money for upgrading two dumpsites, Chennai Corporation in *Tamil Nadu* kept Rs. 18 crore, released during 2003-05, in fixed deposits.

▪ The provision for management of waste in the state budgets was low
  ▪ Only 30 *per cent* and 27 *per cent* of the sampled states made some provisions for municipal solid waste and bio-medical waste management.

▪ 55 per cent of the sampled states reported shortages in manpower in the municipalities hampering municipal solid waste management
Audit recommendations to Objective 7

- States should make adequate provisions for waste management activities, both municipal solid waste and biomedical waste in the budget to ensure that municipalities and hospitals have adequate funds for waste management.

- State governments and PCBs should assess manpower requirement for implementing the waste rules and accordingly, raise a staff dedicated to the implementation and monitoring of waste management activities.
Overall audit conclusions

1. MoEF/CPCB/states do not have a complete data about all the various kinds of waste being generated in India

2. Risks to health/environment had not been adequately assessed by MoEF/states

3. Waste management efforts in India were not directed by a clear-cut policy, which incorporated a waste hierarchy

4. Rules were not framed for all kinds of waste, like construction & demolition waste, electronic waste, agricultural waste, etc

5. Instances of the polluter being held responsible for unsafe disposal were very few

6. Absence of a single body taking ownership of waste issues in India
6. Study of compliance to municipal solid waste rules revealed that Collection, segregation of waste after collection, waste processing facilities and scientific landfills were almost non-existent.

7. Study of compliance to bio-medical waste rules also revealed that hospitals/private operators were running waste disposal facilities without authorization and segregation/disposal was not taking place.

8. Study of compliance to plastic waste rules revealed that ineffective enforcement of the rules by the DCs/DMs and PCBs.

9. Weak compliance was compounded by lax and ineffective monitoring.

10. Absence of adequate funds/manpower for waste management activities
Audit impact

- MoEF accepted the recommendations of audit and constituted a committee to draw up a road map for the management of waste in India.
  - The terms of reference of the Committee is to make recommendations for evolving a policy and mechanisms for effective implementation and monitoring of waste in India keeping in view the recommendations made in the Performance audit.

- The Committee consisted of senior officials of the Government involved in waste management, Federal Pollution Control Board, representatives from Non Governmental Organisations, and eminent persons in the field of waste management. A representative of the C&AG has also been invited to attend the meetings.

- Committee made more than 100 recommendations which are being put into practice now.
Action proposed by government

- Bodies which would be responsible for the implementation and monitoring of the different waste management rules should also be identified, both at the central and state level
  - A nodal body to guide monitor and train personnel for managing all kinds of waste, should be set up at the Central level
- Safe and sustainable Waste management through segregation, collection and categorization of all types of recyclables and their processing/reprocessing should be made mandatory in each municipality
- More efforts need to be put in for waste segregation at the level of municipalities and hospitals
Thank you
London convention

- London convention on Prevention of Marine Pollution by Dumping of Wastes and Other Matter
  - Global agreement that was drawn up at the Inter-Governmental Conference on the Dumping of Wastes at Sea in London in 1972
  - Entered into force in 1975
  - Objective
    - prevent pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea
  - In 1993 a detailed review of the London Convention took place
  - Review completed with the adoption of the 1996 Protocol to the London Convention replacing the London Convention
The MARPOL Convention for the Prevention of Pollution from Ships

- Main international convention covering prevention of pollution of marine environment by ships from operational or accidental causes
- Convention was adopted in 1978 at the International Maritime Organization (IMO) and entered into force in 1983
- The key objectives of the Convention are:
  - To eliminate pollution of the sea by oil, chemicals, harmful substances in packaged form, sewage, garbage and other harmful substances that might be discharged in the course of operations;
  - To minimise the amount of oil that could be released accidentally by ships, including also fixed or floating platforms
  - To improve further the prevention and control of marine pollution from ships, particularly oil tankers
Global agreement addressing the problems and challenges posed by hazardous waste

The key objectives are to minimise

- Generation of hazardous waste in terms of quantity and hazardousness
- Dispose of them as close to the source of generation as possible
- To reduce the movement of hazardous waste

By 1 July 2002, there were 151 Parties to the Convention

Convention was principally devoted to setting up a framework for controlling the transboundary movements of hazardous waste, that is, the movement of hazardous waste across international frontiers

It developed criteria for "environmentally sound management"

A control system, based on prior written notification, was also put into place
Bamako and Waigani Conventions

- The Basel Convention has links with regional hazardous waste regimes, in particular
  - the 1991 Bamako Convention (which came into force in 1998)
  - The 1995 Waigani Convention (which came into force in 2001)
- Bamako Convention prohibits the import of hazardous waste into Africa
- Waigani Convention prohibits the import of hazardous waste into Pacific Island developing countries
- These regional regimes were partly established in response to the initial failure of the Basel Convention to ban exports from North to South
- These regional agreements may also assist national implementation of environmentally sound waste management strategies.
Convention on Nuclear Safety

- Global agreement that was adopted in Vienna in 1994
- Aim is to
  - legally commit participating states that operate land-based nuclear power plants to maintain a high level of safety by setting international benchmarks to which states would subscribe
- The Convention is an incentive instrument
- Not designed to ensure fulfillment of obligations by parties through control and sanctions, but is based on their common interest in achieving higher levels of safety, which will be developed and promoted through regular meetings of the parties
Joint Convention

- **Objectives**
  - To achieve and maintain a high level of safety worldwide in spent fuel and radioactive waste management
  - To ensure that during all stages of spent fuel and radioactive waste management there are effective defenses against potential hazards so that individuals, society and the environment are protected from the harmful effects of ionizing radiation, now and in the future, in such a way that the needs and aspirations of the present generation are met without compromising the ability of future generations to meet their needs and aspirations
  - To prevent accidents with radiological consequences and to mitigate their consequences should they occur during any stage of spent fuel or radioactive waste management
Water Pollution in India

Director,
International Center for Environment Audit and Sustainable Development (iCED),
Jaipur
“Every year, more people die from the consequences of unsafe water than from all forms of violence, including war”
Plan of presentation

• Significance of topic
• Audit Process
  – Scope of audit
  – Audit objectives
  – Audit criteria
  – Audit sampling
• Innovative audit methodology
• Audit findings and recommendations
• Audit impact and results
• Challenges faced during audit
• Lessons learnt
Water Pollution: Significance of the topic

• Clean, safe & adequate freshwater is vital to the survival of all living organisms
  – Also vital for smooth functioning of ecosystems, communities and economies

• India’s 14 major, 55 minor and several hundred small rivers receive millions of litres of sewage, industrial & agricultural wastes
  – Issue of water pollution had been flagged by leading environmentalists in India as one of the most important environment issues facing India
Audit scope

- Audit of measures to control pollution of rivers, lakes and ground water in India
- Audit at 2 levels: the federal level and provincial level
  - At federal level
    - policy/planning issues/data adequacy/monitoring
    - Main federal ministry handling environment issues, called Ministry of Environment and Forests (MoEF) & main ministry at the federal level for water issues called Ministry of Water Resources (MoWR) were audited
    - Another agency at the federal level, responsible for water quality assessment, called Water Quality Assessment Authority (WQAA) was also audited
Audit scope

– At the provincial level

• implementation and monitoring of programmes for the control of pollution of rivers, lakes and ground water by the designated implementing agencies

• also included adequacy of planning to control water pollution, existence of accurate water quality data as well as impact of pollution control measures on quality of water in rivers, ales and ground water all over India
Audit Objectives

1) **Inventory of water sources has been prepared and whether the overall status of quality of water in rivers, lakes and groundwater has been adequately assessed in India;**

2) **Risks of polluted water to health of living organisms and the impact on environment have been adequately assessed;**

3) **Adequate policies, legislations and programmes have been formulated and effective institutions been put into place for pollution prevention, treatment and restoration of polluted water in rivers, lakes and ground water;**
Audit Objectives

4) **Programmes for pollution prevention, treatment and restoration of polluted water in rivers, lakes and ground water have been planned, implemented and monitored efficiently and effectively;**

5) **Funds were utilized in an efficient and economic manner to further the aim of reduction of water pollution;**

6) **Programmes for the control of pollution had succeeded in reducing pollution levels in ground water and surface water and restoring water quality.**
Audit criteria

• Derived from:
  – The Water (Prevention and Control of Pollution) Act, 1974
  – Guidelines for implementation and monitoring of National River Conservation Plan and National Lake Conservation Plan
  – National Water Policy, 2002
  – National Environment Policy 2006
  – Guidelines of United Nations Environment Programme (UNEP)
Audit sampling

- Audit sample selected on the basis of assessment of risks like expenditure, criticality of the project in pollution control and feedback received from the public to the advertisement placed in newspapers.
  - Out of 1079 projects for pollution control of 24 rivers across 19 States being implemented, we audited **140 projects for 24 rivers**.
  - Out of projects for conservation of 58 lakes in 14 States, we studied **22 projects across 14 States**.
  - Out of a total of 6053 blocks across India, we examined **116 blocks** for implementation and monitoring programmes relating to ground water pollution.
Innovative audit methodology

• Before commencement of audit
  – Stakeholders’ Conference on Environment Audit
  – International Conference on Environment Audit “Concerns about Water Pollution”
  – Advertisement in newspapers

• Audit methodology
  – Use of detailed audit checklist
  – Use of water quality testing reports to establish quality of water
In July 2009, SAI India organised a Stakeholders’ Conference on Environment Audit to flag major environmental issues in India and to identify significant areas for audit enquiry in the future.

Experts from Civil Society organisations, from Ministries of Environment & Forests and Urban Development, from the Indian Meteorology Department & representatives/corporate bodies working in the field of environment attended the Conference.

- Identified water pollution as the most critical issue affecting India.
International Conference on Environment Audit “Concerns about Water Pollution”

• 2-day International Conference on Environment Audit - Concerns about Water Pollution in March 2010
• Attended by members of various Civil Society Organisations, Government Agencies, International Agencies and Regulatory Bodies like
International Conference on Environment Audit

“Concerns about Water Pollution”

• Heads of SAIs from Austria, Bhutan, Maldives and Bangladesh also shared their concerns about water pollution

• Flagged issues like
  – Lack of coordination and ownership between the different agencies that are involved in implementation
  – Need for the government to review the low levels of budgetary priority given to environment programmes in the country
  – Need to co-relate the reality that the number of citizens dependent on water bodies for livelihood with the creation of programmes for conservation
The Comptroller and Auditor General of India will be conducting a Performance Audit on the subject “Pollution of ground water, lakes and rivers in India” during 2010-11. In case you want to draw attention to any specific problem/issue regarding water pollution which is affecting you or the environment around you, please get in touch with us. We would try to address these important issues in our report.

Email: cag.water@gmail.com
Postal address: Office of the Principal Director of Audit, Scientific Departments, DGACR Building, IP Estate, NEW Delhi 110002.
Fax No: 011-23702353
E-mail account created

- Database of e-mails created—used as input to frame audit questions
Use of detailed audit checklist

• As audit was to take place at federal level as well as simultaneously in 25 states across India, detailed questionnaires according to the agency being audited were developed
  – Enabled us to get answers to all of audit questions
  – Helped us to prepare state wise report
Use of water quality testing reports to establish quality of water

• Analysis of samples of water in rivers, lakes and ground water sources which were in audit sample
  – Helped establish impact of water pollution measures on the quality of water in India’s rivers, lakes and groundwater sources
  – Drew attention to good and bad practices
Objective 1: Audit Findings

- Preparation of Inventory
  - No survey by MoEF to identify all rivers and lakes, only 56% states carried out district-wise assessment of ground water resources
- Biological indicators
  - Only a few biological indicators identified for only some rivers in India
  - Biological indicators not been identified for any lake in India by MoEF/CPCB
Objective 1: Audit Findings

• Identification/quantification of contaminants like nutrients, acids, salinity, pathogenic organisms etc., not undertaken

• Effect of human activities affecting the quality of water like agriculture, industrial activities mining, uncontrolled disposal of human waste etc., not been done for any river/lake in India
  – Incomplete assessment by states
Objective 2: audit findings

- Identification of risks to environment
  - Wetlands associated with each river/lake & risks to them due to pollution of river/lake water not done
  - Major aquatic species, birds, plants and animals facing risks due to pollution of rivers and lakes not identified

- Risks to human health
  - Risks to human health from water borne diseases caused by pollution of rivers assessed by only 28% and not done by MoEF
  - Risks to human health from arsenic, zinc, iron, mercury, copper, chromium, cadmium, lead, persistent organic pollutants etc., as a result of pollution of rivers had been assessed by only 8% and not done by MoEF
Objective 3: audit findings

• Existence of policy
  – No separate policy to tackle water pollution framed by MoEF
  – A separate policy for addressing water pollution formulated by only 4 states
  – No programmes introduced for tackling agricultural non-point pollution of rivers and lakes by measures like promoting the use of organic manure, crop rotation, banning use of synthetic pesticides and fertilizers, integrated pest management etc.

• Adequacy of institutions
  – No agency given responsibility for pollution issues for ground water
  – WQAA not working effectively
Objective 4: Audit findings

- Planning, implementation and monitoring were weak
  - Projects not completed on time and failed to meet their objectives
  - Performance of projects unsatisfactory
  - Not monitored as envisaged
  - Paucity of network for tracking pollution of rivers, lakes and ground water
  - Inadequate number of monitoring stations, no real-time monitoring of water quality was taking place and the data on water quality had not been disseminated adequately
Objective 5

- Funds available for control and prevention of water pollution and restoration of wholesomeness of water were not adequate
  - These were also not utilized effectively and economically
Objective 6

- Majority of rivers remain polluted and continue to be plagued by high levels of organic pollution, low level of oxygen availability for aquatic organisms and bacteria, protozoa and viruses which have faecal-origin and which cause illnesses
  - Most lakes are under threat from nutrient overloading which is causing their eutrophication and their eventual choking up from the weeds proliferating in the nutrient-rich water.
- Implementation programmes for preventing pollution of these lakes has had no discernible effect
Good practices

• Gujarat
  – All the test checked projects were completed and were working as envisaged. The capacity of the STP is higher than the quantity of sewage generated. Currently, no sewage flows into the Sabarmati from the city

• Uttaranchal
  – Rejuvenation of Nainital Lake

• Karnataka
  – Kotekere lake
Recommendations

• Citizens Monitoring Committee and Local level lake monitoring committees need to be constituted to provide feedback for more effective implementation

• Monitoring network should be strengthened by converting all monitoring locations into stations and reclassifying them as baseline, trend and flux stations for achieving better quality data
  – MoEF should also start real time monitoring so that red flags are raised immediately when pollution levels rise alarmingly and remedial action can be taken in time

• The main ministry at the federal level for pollution related issues (MoEF) should take into account the basin approach while planning for reduction of pollution of all rivers and lakes in the country
Impact of audit

- Report had high impact
- At the time of the exit conference to discuss the audit report, MoEF committed to set up a committee to draw up a roadmap to implement audit recommendations in the report
  - Committee consisted of representatives of MoEF and Ministry of Water Resources, Ministry of Urban Development and a representative of CAG
Impact of audit

• Committee proposed the following high level decisions
  – Capacity building of Central and State Pollution Control Boards (PCBs)
  – Institutional reforms in Central and State PCBs
  – Environment violations need to be suitably penalized; necessary amendments to be made to Environment Protection Act
  – Policy to be framed by Ministry of Water resources for rational use of water by agriculture, industrial and domestic purposes
  – Policy to be framed by Ministry of Agriculture check pollution of surface and ground water by agricultural runoff

• 34 specific recommendations made by the Committee under these broad area
Impact and results
Impact and results

• The report was presented to the Parliament in December 2011 and was widely reported in the press

• The Public Accounts Committee of the Parliament took up discussion of the report

• Still being discussed
  – Terming water pollution as a "national crisis", PAC has decided to summon officials of at least six central ministries to seek their views to find ways to check the problem
Challenges faced during audit

- Lack of data regarding pollution levels in rivers/lakes
- Absence of some records pertaining to implementation of the projects, specially those which were more than 5 years old
- Multiplicity of authorities dealing with programmes to prevent pollution of rivers and lakes; as a result, lines of communication were not very clear
- Coordination of audit which was simultaneously taking place in 25 states/provinces
- Some of the concepts relating to control of pollution were scientific in nature. So auditors had to be trained and given exhaustive material so as to better acquaint them with technical issues in water pollution
Lessons learned

• Immense value addition through consultations with external stakeholders and those working in the field before choosing a topic
• Placing advertisement in newspapers gave us a very good indication of the scale and dimensions of the issues involved in the audit
• Providing at least one complete year from planning the audit to preparing the report
Thank you