Water Pollution in India

A case study
The Dal Lake
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The Dal Lake
• Clean and plentiful water provides the foundation for prosperous communities.

• Water pollution is the presence of harmful material in water in sufficient concentrations to make it unfit for use.
“Every year, more people die from the consequences of unsafe water than from all forms of violence, including war”
Audit- case study

• **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, lakes 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 groundwater;
4) Programmes for pollution prevention, treatment and restoration of polluted water in rivers, lakes and groundwater 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
Stakeholders’ Conference on Environment Audit

• 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.

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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