ENVIRONMENT AND POLLUTION CHALLENGES IN GANGA RIVER BASIN

May 1, 2012
Rivers in India

- 45,000 km of riverine length
- 12 major river basins, 46 medium river basins, 14 minor and desert river basins
- Ganga Basin: largest, lies in 11 States
- Lifeline of the people
- Closely linked with culture and tradition
## Water Quality Status of Rivers

Analysis of 10 years data with respect to BOD values as indicator of organic pollution

<table>
<thead>
<tr>
<th>S. No</th>
<th>Level of Pollution</th>
<th>Pollution Criteria</th>
<th>Riverine length (Km.)</th>
<th>Riverine length (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Severely polluted</td>
<td>BOD more than 6 mg/l</td>
<td>6086</td>
<td>14</td>
</tr>
<tr>
<td>2.</td>
<td>Moderately polluted</td>
<td>BOD 3-6 mg/l</td>
<td>8691</td>
<td>19</td>
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<tr>
<td>3.</td>
<td>Relatively clean</td>
<td>BOD less than 3 mg/l</td>
<td>30242</td>
<td>67</td>
</tr>
</tbody>
</table>
Main Water Quality Threats

- Municipal Sewage: Sewage treatment capacity 12,000 mld against 38,000 mld generated from class I & II towns
- Industrial Effluents
- Non-point sources
- Over-exploitation of water resources
Ganga Basin: Issues

• Ganga Basin: largest, lies in 11 States

• Point Sources: Municipal (80%); Industrial (20%)

• Non-point sources: runoff from agriculture, solid wastes, open defecation, cattle wallowing, throwing of dead bodies

• Sewage generated: 12,410 mld; treatment capacity: 5070 mld (CPCB; 2009)

• GAP: Investment of `900 crore; treatment capacity of around 1065 mld created in 73 towns

• Diminishing flows
Challenges

- Huge sewage treatment deficit; Industrial pollution
- Tackling fecal coliform
- Restoring natural ecosystem
- Constraints of ULBs & implementing agencies
- Capacity of SPCBs to address compliance & enforcement
- Community involvement
- Flow augmentation
- Focused attention required on critically polluted stretches e.g. Kannauj to Varanasi
Ganga Action Plan

• Initiated in 1985; Town centric, focussed on interception, diversion and treatment schemes

• Investment of ` 900 crore; treatment capacity of around 1065 mld created in 73 towns

• Despite industrial & urban growth, BOD and DO values at most locations improved
Schemes

- Major types of schemes and % cost incurred
  - Interception & Diversion of sewage (I&D) – 52%
  - Sewage Treatment Plant (STP) - 37%
  - Low Cost Sanitation (LCS) - 7%
  - River Front Development (RFD) - 1%
  - Crematoria (CRE) – 0.5%
  - Public Participation & Awareness (PP&A) – 0.5%
  - Other schemes – 2%
Water Quality of Ganga

Bio-chemical Oxygen Demand (Summer Average)

STANDARD (3 mg/l or less)

<table>
<thead>
<tr>
<th>TOWNS</th>
<th>1987</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>KANNAUJ</td>
<td>5.1</td>
<td>3.2</td>
</tr>
<tr>
<td>KANPUR</td>
<td>3.6</td>
<td>2.8</td>
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<tr>
<td>ALLAHABAD</td>
<td>15.5</td>
<td>5.1</td>
</tr>
<tr>
<td>VARANASI</td>
<td>15.6</td>
<td>4.3</td>
</tr>
<tr>
<td>PATHA</td>
<td>2.2</td>
<td>2.5</td>
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</table>
Water Quality of Ganga

Dissolved Oxygen (Summer Average)

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</thead>
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<td>6.5</td>
<td>8.1</td>
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<tr>
<td>KANPUR</td>
<td>6.7</td>
<td>7.6</td>
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<tr>
<td>ALLAHABAD</td>
<td>6.6</td>
<td>7.8</td>
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<tr>
<td>VARANASI</td>
<td>5.9</td>
<td>8.0</td>
</tr>
<tr>
<td>PATNA</td>
<td>8.1</td>
<td>7.1</td>
</tr>
</tbody>
</table>

STANDARD (5 mg/l or more)
Experience with GAP: Mixed Success

- Visible improvement lacking, coliform levels unacceptably high
- In critically polluted stretches, BOD values do not meet bathing water quality standards
- Counterfactual; but for GAP, problem would have gotten worse; further deterioration arrested
- Step in right direction, inadequate investment, resources thinly spread
Experience with GAP: Mixed Success

- Implementation slow
- Sub-optimal utilization of assets
- Poor O&M
- Weak enforcement by State Pollution Control Boards
- Lack of civil society involvement
New Initiative: NGRBA

- Constituted on 20.02.2009. Joint Centre-State structure. Empowered under EPA. Chaired by PM. Includes CMs. Strong presence of experts and civil society

- Planning, financing & coordinating body. Implementation through States

- Development of river basin management plan

- Maintenance of environmental flows
How new approach is different

- Empowered Authority
- Shift from town centric to river basin approach
- Integrated approach, no standalone investment
- Sewerage infrastructure, catchment area treatment, tackling industrial effluents, river front development
- Dovetailing with JNNURM & UIDSSMT schemes
- Emphasis on environmental flows
Institutional Design

- Apex Council chaired by PM
- Standing Committee under Finance Minister
- Empowered Steering Committee; fast track project approval mechanism
- State River Conservation Authorities
- Implementation by States, ULBs
Pollution abatement Projects sanctioned under NGRBA

- Projects worth Rs 2598 crores sanctioned
- Projects relate to sewer networks, sewage treatment, river front development, community sanitation
  - Uttar Pradesh: Rs 1341.60 crore
  - Bihar: Rs 441.86 crore
  - West Bengal: Rs 659.41 crore
  - Uttarakhand: Rs 155.60 crore
- Sewage treatment capacity: 470 mld
- Projects sanctioned on design-build-operate (DBO) basis with 15 years O&M; first 5 years shared between Centre and States
New Measures for Improved Implementation

- Revised Guidelines for DPR formulation
- Projects based on comprehensive approach, including conveyance networks; convergence with JNNURM and other schemes
- Project appraisal by reputed independent institutions
- Third Party Inspections (four stages)
- DBO model; 15 years of O&M to be part of project, of which initial 5 years O&M costs to be shared by GoI
New Measures for Improved Implementation

- Technology selection based on lifecycle cost analysis
- Tripartite MoA between Centre, States & ULBs to improve implementation and ensure proper O&M
- City-level citizen committees
- Research Advisory Committee to encourage innovative technologies
- States setting up exclusive NGRBA implementation agencies as registered societies
World Bank Supported Project

- National Ganga River Basin Project approved by GoI & World Bank

- Project Cost: 7000 crore (US $ 1.55 billion) [Centre: Rs 5100 crore; States: Rs 1900 crore]

- World Bank assistance: US $ 1 billion (IDA: $199 m, IBRD: $ 801 m); loan agreement signed

- Project launch: August 2011; duration: 8 years

- Implementation by NMCG, SPMGs & EAs
Project Components & Outlays

Infrastructure investments [Rs. 6100 crores]
- Wastewater (collection and treatment) – 4800 cr
- Industrial pollution control – 500 cr
- Solid waste management – 300 cr
- River front management – 500 cr

Institutional development [Rs. 600 crores]
- Central & state-level PMGs
- Ganga knowledge centre
- Water quality monitoring system
- Capacity building of SPCBs and Urban Local Bodies
- Research, Studies, Pilots and Training
Project Components & Outlays

Project Implementation support [Rs. 300 crores]

- Consultancies: PMC, TSC
- Supervision, monitoring & evaluation
- Communication & public awareness program
- Incremental operating costs
NGRBA Program Framework

• Implementation Arrangements
• Investments Framework
• Financial Management Manual
• Environment and Social Management Framework
• Communications and Public Outreach
• Governance and Accountability Action Plan
Ganga Knowledge Centre

- Integral part of NMCG
- Repository of knowledge for Ganga
- Data on Ganga river basin management in areas of pollution, water use, biodiversity & socio-economic
- Carry out analysis & modelling
- Dissemination of information- outreach centre
Water Quality Monitoring

• Need to increase number of stations, parameters and frequency of monitoring

• Modern approach and instrumentation including real-time monitoring systems

• Service Contract to be coordinated by CPCB

• Improved information flow, stronger analysis

• Community monitoring, bio-monitoring
Capacity Building of Pollution Control Boards

- To address key constraints
- Improving information systems
- Staff skills; infrastructure facilities
- Improve compliance & enforcement
- Laboratory upgradation
Capacity Building of Urban Local Bodies

- Support ULBs as well as local-level water and wastewater service providers
- Modern & efficient information & planning system
- Training & equipment
- Technical assistance for improving revenue and cost recovery to ensure sustainability of investments
River Basin Environment Management Plan

• Prepared by consortium of 7 IITs

• Management Plan would include:
  ▪ Quantification of sewage, industrial, and non-point pollution loads;
  ▪ Measures for maintaining water quality with a roadmap for control & prevention of pollution into Ganga and its tributaries;
  ▪ Measures for maintaining environmental flows;
  ▪ Measures for catchment area treatment, floodplain protection, public participation and awareness, water conservation;
  ▪ GIS based Atlas of Ganga Basin; and
  ▪ Assessment of technical & financial resources required

• 5 reports on identification of issues, preparation of urban river management plan, sewage collection, diversion, treatment and reuse, floodplain mapping submitted
Thank You