Best water reuse practices in industry

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Critical factors in urban water sector

- Cities likely to house 40% of India’s population by 2030
- Increase in service demand by 2.3 times by 2030
  - Water supply
  - Sewage generated

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% of Service Backlog in Water Supply in various Categories of Cities – OPPORTUNITY EXISTS

© Confederation of Indian Industry
% of Service Backlog in Sewage Management in various Categories of Cities – OPPORTUNITY EXISTS

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Major water consumers

- **Domestic**
  - Residential & Commercial buildings

- **Water intensive industries**
  - Power, Petrochemical, Iron & steel, Engineering & Automobile
  - SME’s

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Approach to Water management

Augmentation of water resources & storage

3 pronged approach

Reduce, Reuse & Recycle (Zero Water Discharge) in Industries / buildings

Use of treated municipal waste water for industries

Focus-Industry, Municipality & building interface

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Promoting Water Use Efficiency in Urban Sector

- **Objective:** Focus on industry, building and municipality interface
- **CII-USAID D-DAI joint initiative**

**Components of the project**

- City based ‘Water Management Plan’
  - Water saving opportunities in three cities Jaipur, Pune & Faridabad
- Recycle of City Wastewater in industry
  - A pre-feasibility report for each city
- Promoting water use efficiency in industry
  - Preparation of a handbook on water management
- Water efficiency in buildings
  - To establish guidelines for water conservation in buildings

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Water management - industry

Potential areas

- Utilities
- Process
- Domestic
- Zero Water Discharge

30% average reduction potential

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Water saving opportunities in Buildings

- Dual Flush Water Closet
- Sensor Faucet & Showers
- Rainwater Harvesting
- Drip Irrigation Systems
- On-site Waste Water Treatment Plant
- Root Zone Treatment System
- Treated Waste Water for Cooling Towers
- Water Meters

Water Saving Potential: 40% - 50%

© Confederation of Indian Industry
Ultra Low Flow fixtures

- Water less urinals
  - No plumbing line for flushing
  - Uses a sealant liquid instead of water to maintain sanitary condition

- Market Transformation:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>Usage</td>
<td>Unknown</td>
<td>Millions of Installations</td>
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<tr>
<td>Cost</td>
<td>INR 15,000</td>
<td>INR 6,000</td>
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</table>

Zero Water Requirement
Best practices in water management
Case study-1

*Sewage reclamation plant, CPCL, Chennai*
Sewage reclamation plant-CPCL, Chennai

- Total city sewage reclaimed for treatment - 20,000 m³ / day

- Benefits
  - Used for DM plant feed & cooling tower make-up
  - Availability of equivalent fresh water for city for domestic consumption

- Cost of treated water Rs.40/ m³ less than fresh water

© Confederation of Indian Industry
Case study-2

Recycle of secondary treated sewage in industry

ITC Bengaluru
Towards conservation of fresh ground water
- Reuse of 200 m$^3$ / day of secondary treated waste water
  - Installed full fledged tertiary treated water system using submerged UF-RO membrane
  - Utilized for non-potable purposes
- Fresh water saving of 73000 m$^3$ / year

© Confederation of Indian Industry
Case study-3

Commercial building

TCS, Siruseri, Chennai

© Confederation of Indian Industry
## Features

<table>
<thead>
<tr>
<th>Annual Rainfall (mm)</th>
<th>Total catchment area (m²)</th>
<th>Water harvesting potential m³</th>
<th>Percentage harvested</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1266</td>
<td>202327</td>
<td>197140</td>
<td>100%</td>
<td>Recharge-55%  Industrial- 45%</td>
</tr>
</tbody>
</table>

88953 m³ capacity storage pond  
Surface & Road Rain water collection

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Benefits

- 25% reduction in fresh water consumption
- 50% of fresh water brought through tankers were reduced
- Flooding avoided both inside and outside the campus
- Reduction in garden water requirement
  - Recharge pits
Case study-4

Improvement of ground water table
De-silting of water bodies &
Road side rain water harvesting
Coimbatore district
During 1970s Coimbatore district was declared as “Drought prone district”.

During 1980s UNDP warned that Coimbatore District had the record of fastest depleting ground water level in the world.

One of the districts in Tamilnadu with highest number of borewells

Issues and challenges

- Encroachments over water bodies.
- Blocked or Diverted water ways.
- Dumping of Solid Wastes.
- Sewage mixing with potable water

Steep decrease in average rainfall per annum

Siruvani dam reaching dead storage levels
Ground water table improvement-approach

- “Siruthuli”- An NGO comprising of Corporates
  - Sri Bannari Amman Group of Companies
  - Pricol Limited
  - Lakshmi Machine Works Limited
  - Elgi Group of Companies
- Desilting of Water bodies
- Encroachment Removal
- Construction of Check Dam
- River restoration through watershed concepts
- Roadside Rainwater Harvesting

© Confederation of Indian Industry
Benefits obtained

- 600 open wells/ bore wells were recharged.
- Positive change in ground water table

<table>
<thead>
<tr>
<th>Zone</th>
<th>Depth of water (in mts) during May 05</th>
<th>Depth of water (in mts) during May 08</th>
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</thead>
<tbody>
<tr>
<td>West</td>
<td>73.17</td>
<td>9.86</td>
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<tr>
<td>South</td>
<td>68.6</td>
<td>9.55</td>
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<tr>
<td>East</td>
<td>76.22</td>
<td>6.59</td>
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<tr>
<td>North</td>
<td>74.7</td>
<td>8.47</td>
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</table>
Sum up

- **Water conservation and management**
  - Critical for urban sustenance

- **Major sectors**
  - **Domestic**
    - Commercial & Industrial buildings
  - **Industry**
    - Water intensive & SME’s

- **Opportunities**
  - 30% water saving potential in industry
  - 40-50% saving potential in buildings
  - Augmentation of water resources
  - Recycle & reuse of municipal water in industry

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The Root Cause of The Great Urban Headache!

Will we ever invent anything this useful again?

© Confederation of Indian Industry
Thank You

Ramani Iyer

Forbes Marshall, Pune

CII Water

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