Water Distress in Growing Cities – Issues & Challenges

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An urbanizing world

Today, one in two people on the planet live in a city

Rising urban population

Every second the urban population grows by 2 people

More people = Higher water demand

The world’s population is growing by about 80 million people a year, implying increased freshwater demand of about 64 billion cubic metres a year

Source: UNESCO
Green Approach- A MUST today- for Sustainability (better life cycle costs and higher performance)- better brand visibility-Better Comfort

• What is Green Approach? – Using technologies which aim to satisfy the water related needs of the community at the lowest cost to society whilst minimizing environmental and social impacts

• The green technologies can be described under two broad categories:
  – Water Efficiency
  – Innovative Technologies
Water Efficiency

- The optimization hierarchy for achieving water efficiency in a cost-effective manner involves:
  - Reducing demands: Achieved through implementation of measures such as a water-efficient landscaping design, water efficient fixtures etc.
  - Meeting demands efficiently: Achieved through optimization of the system design by using measures such as Use of high-efficiency drip systems, climate based controls, such as moisture sensors with water supply shut-off arrangements, etc.
  - Greening the supply of any residual, reduced demand.
Innovative Wastewater Technologies

• Innovative water/waste technologies generally is a term used for options such as:
  – Ultra high-efficiency plumbing fixtures;
  – Composting toilets and waterless urinals (which use no water);
  – Foam flush composting toilets (which require minimal water per use);
  – Smart sewers (which include small diameter pressurized sewer systems) to eliminate wet weather infiltration and also allow for control over loading on sewage treatment plants.
Importance of Plumbing Increased
As Buildings/Building Clusters became more complex

- Introduction to high-rise buildings
  - Multistage pumping
  - Service floors
  - Large water tanks

- Basements extended beyond building line
  - Need to divert plumbing lines at basement ceiling
  - Coordination with other agencies

- Complex structures
  - Post tension slabs
  - Large spans
  - Concrete walls
Importance of Plumbing Increased
As Buildings/Building Clusters became more complex

Due to the new Utilities required

– High Pressure requirement for some fixtures
– Dual piping
– Solar, Central hot water systems
– Central cool drinking water system
– Landscaping on terraces and parkings
– Hydro-pneumatic Systems
– Multiple metering
– Building Management Systems
Importance of Plumbing Increased
As Buildings/Building Clusters became more complex

Increase in General awareness

– Health Aspects of Plumbing
– Good plumbing ensures public health
– Good plumbing ensures building health
– Mandatory Rainwater Harvesting
– Water and energy conservation
– Eco-friendly designs
Purpose of Codes

• Codes provide the means to reduce risk to acceptable levels.

• Codes protect the health, welfare, and safety of the public in four ways:
IAPMO-India

• IAPMO is an 87 year old non-government organization (NGO) and non-profit association serving the industry
• We are devoted to Health and Safety, primarily in the Plumbing and Mechanical fields
• In 2007, IAPMO established IAPMO – India.
• This resulted in the International Association of Plumbing and Mechanical Officials (IAPMO) and the Indian Plumbing Association (IPA), working together to establish a model code of plumbing installation and maintenance for all of India.
IAPMO India Activities

• Development of codes and standards
• Code based Education and Training Programs
• Plumbing Education to Employment Program (PEEP)
• Mechanical Education to Employment Program (MEEP)
• Green Plumbers India (GPI) Program
• Testing and Certification of Plumbing and Mechanical products
• Water and Energy Audit
• Inspection body for Infrastructure Projects
IPA- IAPMO Codes and Publications

All codes are the base for Training and Accreditation Workshops

By following the provisions of UPC-I and GPCS-I you can save 35% or more on water consumption
Training and Accreditation Workshops

- Recognition to International body
- Industry-Institutional interactions
- World class Plumbing & Mechanical HVAC-R education to staff
- Better plumbing ensuring health & safety of public and structures
- Quality plumbing, more productivity, better reputation
- Better mechanical installations ensuring energy conservation, enhanced IAQ, safety of public and structures and reduced maintenance
- Energy efficient installations, increased efficiency and productivity, better reputation
Green Code Supplement Ushers in a New Era

GIVES MUNICIPALITIES ABILITY TO TAKE THE LEAD ON SUSTAINABLE BUILDING INITIATIVES

- To ensure supply of safe drinking water
- To remove the waste water efficiently
- To minimize the risk of failure through vigilance and quality assurance
Genesis

• The need for introducing the rating system for water deficient devices is a recent one in the country and is a result of fast Urban Growth.

• Earlier most of India’s population resided in its villages. At the time of independence of the Country the Urban Population was only about 10%.

• In Rural India as also in Urban India, the domestic water needs were met largely from the underground resources.

Alternate Water sources

Rainwater
Reclaimed water
Treated waste water/process water
Treated sewage
Gray water recycling

Convenience, cost, hazards
Water Efficient Products- India (WEP-I)

Plumbing Fixtures considered for WEP-I Labelling
• WEP-I will seek to;
  • Provide credible information on water-efficient products and practices.
  • Raise awareness about the importance of water efficiency and recommend water-efficient products.
  • Aid consumers to make an informed choice of products that conserve water.
Water Conserving fixtures and fittings

1. High Efficiency Toilets (HET) – 20% water savings and more

2. Waterless and Ultra Low Flow Urinals - Over 88% water savings

3. Commercial Bathroom Faucets - Over 75% water savings

4. Showerhead Replacements - 50% reduction
## Maximum flow rates at fixtures

### 2013 Water Efficient Products - India (WEP-I)

<table>
<thead>
<tr>
<th>Residential Fixture/Fitting</th>
<th>Conventional</th>
<th>1 Star WEP-I High Efficiency</th>
<th>3 Stars WEP-I Ultra High Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>European water closets:</td>
<td>6 Lpf full flush</td>
<td>4.8 Lpf full flush</td>
<td>4.0 Lpf full flush</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.20 Lpf savings, or 20%</td>
<td>2.00 Lpf savings, or 33%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5% Lpf savings</td>
<td>33% Lpf savings</td>
</tr>
<tr>
<td>Urinals:</td>
<td>4 Lpf</td>
<td>3.8 Lpf</td>
<td>1.0 Lpf</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.20 Lpf savings, or 5%</td>
<td>3.00 Lpf savings, or 75%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5% Lpf savings</td>
<td>75% Lpf savings</td>
</tr>
<tr>
<td>Shower heads:</td>
<td>10 Lpm</td>
<td>9.5 Lpm</td>
<td>5.7 Lpm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.50 Lpm savings, or 5%</td>
<td>4.30 Lpm savings, or 43%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5% Lpm savings</td>
<td>43% Lpm savings</td>
</tr>
<tr>
<td>Lavatory/Sink Faucets:</td>
<td>8 Lpm</td>
<td>8 Lpm</td>
<td>5 Lpm</td>
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<tr>
<td></td>
<td></td>
<td>0 Lpm savings, or 0%</td>
<td>3.00 Lpm savings, or 38%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Lpm savings</td>
<td>38% Lpm savings</td>
</tr>
</tbody>
</table>

**Note:** Above flow rates are at a working pressure of 5.5 bar (80 psi).

Table 4-1, UPC-I
Look for the Mark, DISCOVER THE VALUE

- Uniform Plumbing Code – India (UPC-I)
- Uniform Plumbing Code – India (UPC-I), and Water Efficient Products – India (WEP-I)
- Uniform Mechanical Code – India (UMC-I)
- Uniform Solar Energy Code – India (USEC-I)
- Uniform Swimming Pool Code – India (USPC-I)

Green Product listings to the Green Plumbing Code Supplement – India (GPCS-I)

UPC-I, WEP-I, USEC-I, USPC-I and GPCS-I are jointly published by IPA and IAPMO India
“We highly appreciate IAPMO India’s certification of water efficient/ low flow plumbing fixtures and appliances, through WEP-I. ADaRSH lays considerable emphasis on water efficiency, and minimum 25% saving with respect to base case, is mandatory for projects. ADaRSH and IAPMO – India, together serve the cause of water- efficiency, which is so critical in today’s world”… Mr. R S Prasad, Member, ADaRSH (Association for Development and Research of Sustainable Habitats), and

“We support IAPMO India’s certification of high efficient, low flow, water efficient plumbing fixtures and appliances, such as faucets, showers, urinals, water closets, ablution sprays, clothes washers, dish washers etc., which will certainly help in saving water to the tune of minimum 25%”…. Mr. Gurmit Singh, Vice Chairman, Mumbai Chapter, IGBC (Indian Green Building Council) Executive Council Member, IGBC Founding Member.
Water & Energy Audits

Palais Royale, Mumbai

ITC Windsor, Bangalore
Factors that contribute to water saving are:

- Right assumptions about the population.
- Modern techniques in landscaping, car wash and washing the paved areas, water treatment and filtration plants.
- Use of raw water, recycled water from car wash etc., reclaimed water (gray and black water treatment) and rainwater.
- Promoting use of Water Conserving Devices and Water Efficient Products (WEP).
- No leaks.

Factors that contribute to energy saving in plumbing are:

- Energy efficient plumbing products such as clothes washers, dish washers, water purifiers.
- Energy efficient water and sewage treatment plants.
- Centralized hot water supply backed by solar hot water system.
- Hydro-pneumatic system for water supply, using energy efficient VFD pumps.
Inspection body for Infrastructure Projects

- QCI approved
- Carried out as per the requirements of ISO/IEC 17020:2012.
- Design approval/ in process/ stage wise/ final Installation and commissioning of Plumbing and Mechanical HVAC-R systems, installations in infrastructure projects.
REMEMBER TO SAVE EVERY DROP!
Thank you