Moving Towards 24x7 Water Supply
An Endeavor of Nagpur Municipal Corporation through Public Private Partnership

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Opinion of citizen for Nagpur City 24x7 Water Supply

Doctor’s opinion for Nagpur City 24x7 Water Supply

Earlier water used to come for two or three hours in a day...
Bulk water security

• For continuous water supply you need sufficient water...for that ...
  1. Reuse the water
  2. Augment the water supply capacity
NMC WATER REUSE = MORE WATER FOR CITY, IRRIGATION & INDUSTRY

24x7 WATER SUPPLY PROJECT NAGPUR

INNOVATIVE* FINANCING

130 ml/day reuse of treated waste water for thermal power plant & reduce stress on fresh water sources (InNURM Grant - Mahagenco)

15 Cr. per yr. → Revenue to NMC

Upgradation of existing 100 ml/day STP to 200 ml/day & reuse of effluents on PPP basis (Operator-Vishwakaj Infrastructure)

Revenue to NMC → New Asset (Future)

Water Reuse Potential in ml/day

<table>
<thead>
<tr>
<th>Consumer</th>
<th>Water Reuse Potential in ml/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAHAGENCO</td>
<td>130 (Agreement Executed)</td>
</tr>
<tr>
<td>Industrial / TPS</td>
<td>150 (PPP-Operator Appointed)</td>
</tr>
<tr>
<td>MIHAN</td>
<td>40</td>
</tr>
<tr>
<td>IRRIGATION</td>
<td>70</td>
</tr>
<tr>
<td>CITY BULK</td>
<td>25</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>415</strong></td>
</tr>
</tbody>
</table>

*No financial burden on NMC
Augmentation to Water Supply

Before Jnnurm — 470 mld

Augmentation under Jnnurm
1. Upgrade of old WTP/Pumps  60 mld
2. Augmentation of Kanhan  120 mld
3. Augmentation of Pench  115 mld

Total Investment Under Jnnurm – Appx 1200 crore

PPP – Investment – Rs 185 Crore (Against ULB share)

Present Water Supply Capacity
765 mld

All new WTPs are fully automatic and built under PPP mode and long term 10-15 years of performance based contract
Low efficiency resulted in higher water losses, poor financial position, deteriorated assets, frequent contamination of water affecting public health, specially urban poor and overall unsatisfied citizen services.

Augmentation to water supply is not a answer to above challenges

Expected Result After Investment of Jnnurm funds in Augumentation
Policy & Strategy for Implementation

Project at final leg towards implementation

- Water Audit
- Pilot Project for improvement in SLB
- Full City Rehabilitation Plan
- O & M Strategy for Sustainability

Admin/Political Reforms
- Rationalization of Tariff
- Billing & Collection
- Policy on PPP
- Slum Policy for Water Supply

Technical Efficiency
- Raw Water Energy Consumption
- Raw Water Energy Consumption
- Pumping Treatment Transport Storage
- Distribution Consumer Connection Metering
Pilot project for 24x7 supply

Salient features of pilot project

• Pilot area identified as Dharampeth zone initiated in 2007
• 10,000 connections (including 10 slum areas)
• Implementation of continuous water supply, 100% metering, rehabilitation of tertiary network, hydraulic modelling, installation of new billing and customer management system.
• 5-year Performance Management Contract sequenced with 9 months preparatory work, 15 months for rehabilitation and 60 months of O&M at a cost of Rs. 27 crore.
• Performance-fee model with bonuses on Key Performance Indicators (KPIs) namely
  – Reduction in Unaccounted for Water level to below 30%,
  – 10% increase in volume billed over 2007-08 baseline,
  – 24x7 supply with pressure higher than 2m,
  – Water quality with residual chlorine greater than 0.2 ppm and
  – Handling of customer complaints within three days.
Impact assessment of Pilot project

ASCI Hyderabad conducted impact assessment study of Pilot Project reporting following outcomes

• 14500 connections converted to continuous water supply.
• Improved pressures, eliminating the need for booster pumps at households level
• Improvement on coverage with 5000 connections being given in slum households
• Billed water volume increased from 22 MLD to 33 MLD in the zone (increase of 50%)
• NRW reduced from 51% to 32% and was attributed to reduction in illegal connections and improved accuracy of meter reading.
Observations on challenges and shortcomings

• Poor Stakeholder communication
  – Consumers not informed of the need to fix internal leakages resulting in higher billed volumes due to transition to pressurised metered supply.
  – A tariff hike resulted in spikes in billing which triggered protests from citizen organisations.

• Continuous 24x7 supply was achieved only 90% of total connections due to
  – challenges in addressing last-mile connection within consumer premises and
  – non-replacement of pipelines in 70% of network
NMC 24/7 Demo Project – Slum Policy Results

• 100% dis-connections of public stand pipes resulted in saving of water & improvements in slum culture in term of hygiene, disputes.
• All slum dwellers (5200 nos) connected to water supply network through individual house service connection resulted in minimize the wastage of water.
• Slum dwellers are ready to pay water charges.
• Dedicated cash counters for payment collection.
• Total water bill distributed till date amounting Rs. 17,29,610 and collection made is Rs. 11,79,038 i.e. 68 % recovery compare to less than 20% earlier.
• Now demo zone urban poor people are happy with service provided to them.
### Status - 24/7 Demo Project

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Status in 2008</th>
<th>Status after Dec2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Connection - Non Slum</td>
<td>9682</td>
<td>10727</td>
</tr>
<tr>
<td>No of Connection - Slum</td>
<td>1657</td>
<td>5168</td>
</tr>
<tr>
<td>No of Stand Post</td>
<td>179</td>
<td>15</td>
</tr>
<tr>
<td>Length of Network</td>
<td>180</td>
<td>204</td>
</tr>
<tr>
<td>% of existing network replacement</td>
<td></td>
<td>32%</td>
</tr>
<tr>
<td>Payment Collection Points</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Supplied Volume (MLD)</td>
<td>43</td>
<td>52</td>
</tr>
<tr>
<td>Billed Volume (MLD)</td>
<td>21</td>
<td>36</td>
</tr>
<tr>
<td>UFW</td>
<td>51%</td>
<td>32% (28% 2011)</td>
</tr>
<tr>
<td>Bills Distributed</td>
<td>11339</td>
<td>15731</td>
</tr>
<tr>
<td>Pressure at Customer Point(m)</td>
<td>2-6</td>
<td>9-12</td>
</tr>
<tr>
<td>Hour of Supply</td>
<td>2-8</td>
<td>14550 Customers -24 Hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1395 Customers - 12-16 Hrs</td>
</tr>
<tr>
<td>Chlorine content less than 0.2ppm</td>
<td>37%</td>
<td>0%</td>
</tr>
<tr>
<td>Average Pressure</td>
<td>3-5 m</td>
<td>12 m</td>
</tr>
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Successful NMC 24/7 Pilot Project

UFW Reduction Program - Results

Trend of UFW over progress of Project

- Commencement of Rehab Phase (August 2008)
- Completion of Rehab Phase (Oct 2010)

<table>
<thead>
<tr>
<th>Time</th>
<th>% UFW</th>
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<tbody>
<tr>
<td>Yr 06-07</td>
<td>52.00</td>
</tr>
<tr>
<td>Jan-Mar 10</td>
<td>37.40</td>
</tr>
<tr>
<td>Apr-June 10</td>
<td>32.35</td>
</tr>
<tr>
<td>July-Sept 10</td>
<td>32.46</td>
</tr>
<tr>
<td>Apr-June 11</td>
<td>28</td>
</tr>
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</table>
PPP for City-wide water supply -

Project inception

• In 2008, NMC’s General Body passed resolution for city-wide 24x7 water supply
• Ring-fencing of water supply assets was done by transferring of water supply functions to a separate company i.e. the Nagpur Environmental Services Limited (NESL) as a wholly owned subsidiary of NMC. This was first fully owned water supply company of any ULB and it has to go through legal department of NMC & GoM which result in to additional time required to complete the process
• Transparent bidding process adopted with extensive stakeholders consultations with editors, NGOs, ward members etc.
• Veolia-Vishvaraj consortium selected through bidding process
• Orange City water Pvt Ltd (SPC) formed by consortium has taken over the Operations of Full city water supply from 1st March 2012.
PPP Basic Principals

- Public Private Partnership with Foreign Partner
- Partnership
  - Asset Ownership: NMC
  - Operation: Private
  - Investment: Both GoI, GoM but ULB share by Private (Rs. 116 Crore)
- NMC to decide Tariff, collection by private partner
- NMC to decide Development Plan for City
- Private Partner to Operate and maintain the system (almost Rs. 80 crore per year by private).
- Private Operator to earn profit through efficiency in Implementation and operations against fees
Features of the PPP agreement

- **Project scope**
  - 25-year Performance Management Contract (extendable for another 25 years)
  - First 5-year OCWPL responsible for O&M of existing network and rehabilitation of the network
  - O&M of the water supply system for next 20 years
  - Revenue and collection risk loaded on Operator
  - Operator’s performance to be monitored against performance parameters
  - Remuneration based on metered volume that is billed and collected.
Total 18000 connection
Additional Population – 150000
Over and above demo zone of 200000 in Dharampeth (24x7 since 2010)

Total Population covered so far
About 350000 in 24x7 water supply through appx 25000 connections. (NMC has One building/premises one connection policy)

85000 Connections Replaced
450 km of pipe line replaced
35 ESR command areas Work in advance progress for conversion (Out of Total 64)
Continuous Water Supply-Holistic Approach

Water Security
- Sustainable source
- Adequate supply

Willingness
- Political
- Administration

Policies
- Service level
- Stakeholder Consultation
- Slum/Unauthorised
- Connect/disconnect
- PPP/Inhouse
- Tariff/Subsidy/Funding
- Bylaws/Act

Infrastructure
- Physical (Source to consumer)
- Organization capacity
- SCADA/Monitoring
- Customer services

Management
- People participation
- Supply Side Efficiency
- Demand Side Efficiency

Supply Side Efficiency

Demand Side Efficiency

Efficiency

Efficiency

Efficiency

Efficiency

Efficiency

Efficiency
Communication/Involvement with Citizens is most crucial .......

It should be People-Public-Private- Partnership

It demonstrated that Indian Urban water supply can be upgraded to 24x7 without 100% replacement of Network
THANK YOU
Challenges

• No role model in India to adapt efficient Urban Water system.

• Nagpur water PPP project was first of its kind in India – took its time to design the acceptable structure

• Water PPP was much more sensitive compared to electricity – long and repetitive stakeholder consultation needed

• Existing legal framework had provided limited freedom to NMC to adopt innovative approach

• Adapting even partial Cost recovery water tariff was a difficult political decision made by NMC

• Non-availability and delayed JnNRUM grants denied timely benefits and made things further difficult for NMC.
Challenges ahead

- Continued stakeholder engagement and communication to build trust and credibility.
- Sequencing and moving forward on tariff reforms.
- Replacement of consumer connections and addressing last-mile and internal plumbing issues need to be tackled head-on as these aspects are critical to consistently deliver 24x7 supply.
- Cost escalation in the Initial Performance Improvement Program Estimates.
Lessons learnt

• Holistic planning and integrated set of actions required for Implementation of city-scale PPPs

• Institutional clarity on the public side helps; needs to be backed with building adequate contract monitoring and administration capacity

• Sustained Political and Administrative commitment is critical; so is wider stakeholder engagement and achieving consumer support

• Sequencing tariff reform