REFORMS IN WATER SECTOR:
NAGPUR MUNICIPAL CORPORATION

Sanjay Sethi, IAS
Commissioner
NEED FOR REFORMS IN WATER SECTOR

Annual expenditure of Municipal Corporation on water supply : Rs 95 crores

Total demand from consumers against water bills: Rs 71.5 crores (deficit of Rs 23.5 crores)

Total recovery against water bill : Rs 50 crores (arrears of Rs 21.50 crores)

STATEMENT OF WATER BILLING DEMAND TO CONSUMER AND IT’S RECOVERY

<table>
<thead>
<tr>
<th>YEAR</th>
<th>DEMAND (IN Rs. CRORES)</th>
<th>RECEIPT (IN Rs. CRORES)</th>
<th>% RECOVERY</th>
<th>WATER SUPPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2002</td>
<td>70</td>
<td>44</td>
<td>63</td>
<td>370 MLD</td>
</tr>
<tr>
<td>2002-2003</td>
<td>73.50</td>
<td>45</td>
<td>63</td>
<td>370 MLD</td>
</tr>
<tr>
<td>2003-2004</td>
<td>71.50</td>
<td>50</td>
<td>69</td>
<td>490 MLD</td>
</tr>
</tbody>
</table>

*RECOVERY INCLUDES ARREAR

Municipal Corporation Makes Payment to Irrigation Department for : 600 ml/ Day (annual avg.)
Municipal Corporation Supplies Treated Water to City : 490 ml/ Day
Municipal Corporation Billing to all consumers against water supply: 240 ml/ Day (annual avg.)

Total Water Losses / UFW/ NRW are 360 ml/ Day i.e. 60 % of supply.

COST OF TREATED WATER IS Rs 5.30/ 1000 ltrs.
ANNUAL ENERGY BILL OF Rs. 22 CRORE /YEAR
## NMC Water Supply: Income Expenditure (in Rs.Lakhs)

<table>
<thead>
<tr>
<th></th>
<th>2003-04 Actual</th>
<th>2004-05 Actual</th>
<th>2005-06 Actual</th>
<th>2006-07 (Estimated for last 4 months)</th>
<th>2007-08 (Budgeted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment Expenses</td>
<td>501.96</td>
<td>574.85</td>
<td>623.86</td>
<td>640.00</td>
<td>670.00</td>
</tr>
<tr>
<td>Energy</td>
<td>2186.32</td>
<td>2110.02</td>
<td>2040.02</td>
<td>2600.00</td>
<td>3000.00</td>
</tr>
<tr>
<td>Raw water</td>
<td>1173.25</td>
<td>939.35</td>
<td>1356.12</td>
<td>900.00</td>
<td>1000.00</td>
</tr>
<tr>
<td>Other expenses</td>
<td>195.90</td>
<td>274.85</td>
<td>191.74</td>
<td>346.00</td>
<td>439.00</td>
</tr>
<tr>
<td>M &amp; R</td>
<td>480.20</td>
<td>397.46</td>
<td>679.53</td>
<td>676.50</td>
<td>792.00</td>
</tr>
<tr>
<td>Total General Expenses</td>
<td>4537.63</td>
<td>4296.51</td>
<td>4891.27</td>
<td>5162.50</td>
<td>5901.00</td>
</tr>
<tr>
<td>Water Charges recovery</td>
<td>4891.20</td>
<td>5146.01</td>
<td>4840.70</td>
<td>5701.00</td>
<td>7500.00</td>
</tr>
<tr>
<td>Old Loan Repayment</td>
<td>3208.47</td>
<td>2111.31</td>
<td>3711.40</td>
<td>4451.48</td>
<td>1879.51</td>
</tr>
<tr>
<td>Capital Expenses</td>
<td>1852.88 (Pench-3)</td>
<td>527.91</td>
<td>720.87</td>
<td>1425.44 JNNURM</td>
<td>3775.00 JNNURM</td>
</tr>
</tbody>
</table>
Water sector Challenges: NMC

- Availability of adequate quantum of water and at economical cost to meet future demand.
- Reduce the cost water supply to consumer
- Water Losses and UFW
- Equitable distribution (Alternate day / 20 hrs/day)
- Accountability
- Water to Slums (inefficient system)
- Water network coverage and inadequacy of network
- Water supply management during summer peak demand
- Old and inefficient assets
- Delay in capacity augmentation for future demand from Limited water sources.
- Capital availability
- Low water tariff and Poor billing mechanism.
- Lack of professional approach.
Vicious circle and strategy

- Inadequate maintenance of existing assets
- Lack of operational expertise
- High UFW
- Strain on Water Resources
- Tariffs not rational

→ Unsatisfied demand
→ Poor cost recovery

AUGMENTATION
- Strain on water resources
- Additional capital expenditure

STRATEGY
Water sector reforms including implementation of Water Efficiency Projects under JNNURM grants with professional approach of private sector to improve the accountability, service standards with special emphasis on urban poor.

FUNDING CONSTRAINTS THROUGH COMMERCIAL SOURCES

FUNDING BURDEN ON NMC

MISMATCH BETWEEN INCREASING NEEDS & DECREASING RESOURCES
NMC Strategy for Reforms in Water Sector

- Fixing of Benchmarking and Performance indicators through Water audit, Energy audit & Financial reforms.
- UFW/NRW reduction program with investment plan
- Assets Upgradation plan for better serviceability and efficiency
- Cost reduction program (Energy, Water & O & M Cost)
- Improvement in services to consumer special emphasis to urban poor
- Implementation of augmentation plans with inbuilt efficiencies.
- Low cost Funds / Grant from Jn-NURM/ Tax free bonds/ PPP
- Performance based contract with 10 to 15 years of O & M for private participation
- Quality & Cost based selection criteria for contractors, consultants and Operators.
- Rationalization of Water Tariff and Billing with Meterisation.
- Capacity building of NMC employees by exposure and training.
- Review of water supply master plan with inclusion of water reuse option

Moving towards Continuous Water Supply in Nagpur
1. Water & Energy efficiency Project worth Rs. 96 crore has been approved and funds received from JNNURM.

2. Reduction in Raw water UFW by 100 mld (Annual savings of Rs. 2.0 Crore on investment of Rs. 35 lakhs).

3. Water Audit & Leak Detection Phase-I of Rs. 28.0 Crore. (Step towards bringing down the UFW to less than 25%)

4. Energy Efficiency Program of Rs 25.00 Crore is under implementation. (Reduction in energy consumption by 20%)

5. Up gradation & Expansion of Distribution Network of Rs 43 Crore (To increase the coverage of piped water network to 100% and equitable distribution of water).
6. Pench-4: *Aug. water to supply project through reduced water losses in canal.*: Rs 422 crore has been sanctioned under JNNURM.

7. New Water Supply Policy for Slums. *To reduce UFW and service to urban poor.*

8. Rationalisation of Water Tariff. *(To recover O & M Cost + Telescopic tariff for water conservation)*

9. Up gradation of Kanhan water supply systems (Project cost Rs. 83 crore sanctioned under JNNURM): *(Optimum Utilisation of water resources)*

10. Water Reuse Projects under WENEXA-II: *To make the region water surplus:* Project cost Rs. 131 crore sanctioned under JNNURM.
Tariff revision for cost recovery and water conservation

• Tariff Revision as approved by General Body
  – Telescopic tariff
    • Minimum domestic tariff increase from Rs 3 per 1000 ltrs to Rs 7.50 per 1000 ltrs.
    • Subsidized tariff for life line consumption up to 8000 ltrs per family per month
    • Supply at cost for consumption beyond life line supply and up to 20000 ltrs per month per family
    • Premium tariff on excessive consumption (>20000 ltrs)
  – Linking of tariff with variation in cost of energy and raw water
    • Energy and Raw water cost make 50% of total O & M cost
    • Variation in raw water or energy cost shall be adjusted as surcharge from consumers.
  – Meter replacement program for all consumer an important part of 24x7 project.
Implementation of 24 x 7 through PPP

• General Body passed the resolution in the month of January 2008 to adapt the PPP mode for Implementation of 24x7 water supply in city.
  – Objectives
    • To reduce the UFW and water losses
    • Better service to consumers
    • Reduced financial burden of NMC on capital and revenue expenditure
<table>
<thead>
<tr>
<th>Description</th>
<th>Rs (in Crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment for Augmentation &amp; Improvements Under JNNURM</td>
<td>615.00</td>
</tr>
<tr>
<td>NMC share 30%</td>
<td>185.00</td>
</tr>
<tr>
<td>24 x 7 System Improvement Rs12000/ connection</td>
<td>240.00</td>
</tr>
<tr>
<td>Immediate Funds requirement</td>
<td>425</td>
</tr>
<tr>
<td>Annual Burden (10 years repayment @ 10% IR)</td>
<td>70.00</td>
</tr>
<tr>
<td>Project Savings/Revenue (with tariff revision and existing collection efficiency)</td>
<td>30.00</td>
</tr>
<tr>
<td>Balance Annual Burden</td>
<td>40.00</td>
</tr>
<tr>
<td>Energy &amp; Raw water cost</td>
<td>40.00</td>
</tr>
<tr>
<td>Future Source development Rahari (10 years)</td>
<td>500</td>
</tr>
</tbody>
</table>
Private Participation in Water Sector
: Old Model of NMC

• All new assets created since 1999 is managed through service contract.
• Existing assets also managed thru service contract for Pumping station/ WTP O&M / Valve operations/ Billing distribution/ Annual maintenance contract for Zonal level
• Disadvantages
  – It is only a labor contract replacing retired employees.
  – No link with performance
  – No accountability towards consumer
  – Short term Contracts break up in small parts with no feasibility for private investment
• Advantage :
  – Reduced number of NMC employees as of now 80% of assets managed by private contractors
  – Short term annual contract can be replaced by better contract
  – Non performing contactor can be replaced by better one
  – Reduced O & M cost
  – Over the period of time capacity built up for local contactors in O & M
  – Prepared the ground for larger involvement of Private participation without affecting the NMC employees. Hence, less resistance for PPP.
Present NMC approach for Private Participation

- Performance based long term contract
- Private Participation in capital cost from Operator
- Technology by operator for lower life cycle cost
- New assets to generate income rather than increase financial burden on NMC or at least reduce financial burden on NMC
- Better service to consumer and urban poor
- Asset ownership with NMC
- JNNURM funding for better viability of project and reduced cost of capital.
- No NMC employee for operating the New assets for Augmentation to water supply projects
Public Private Partnership in Water Sector

• Project Finalized Under JnNurm
  – Pench-I WTP Improvement & Up gradation (Rs 6.42 Crore)
    • 70% grant in aid, 30% by private operator (Veolia Water)
    • 5 Years O & M by operator
  – Water reuse For Power Plant (Rs 130 Crore)
    • 70% grant in aid, 30% by Mahagenco
    • 30% O & M by Mahagenco & pay to NMC the raw sewage charges @ Rs1.07 – 1.50 per 1000 Ltr for 110 MLD. Annual revenue to NMC Rs 4.50 – 6.00 crore from sewage
  – 24/7 Water Supply (Rs 20 Crore)
    • 5 years O & M with performance based targets to reduce UFW and improvement in service level to customers in a pilot zone of 1.25 lakhs population.

• Projects Under Tendering for 30% share from private sector
  – Improvement to Kanhan Water Supply (Rs 83 Crore)
  – Pench-IV Part –I raw water pipe line project (Rs. 200 Crore)
  – Pench IV Part-2 WTP project (Rs 25 Crore)

• Upcoming Projects for Private Participation
  – Water production and distribution management of Nagpur City as a whole.
    • 2.5 million population, 585 mld of water supply, 2.0 lakhs connection
  – Water reuse for 200 mld of raw sewage for power, industrial and other non potable uses.
PPP in UN-INTERRUPTED WATER SUPPLY: OBJECTIVES

- UN-INTERRUPTED WATER SUPPLY at desired pressure.
- 100% Meterisation including NMC properties.
- Optimise the UFW (Real + Apparent Losses) < 15%
- Efficient billing mechanism.
- Sufficient supply to meet the water demand of Urban poor (Slums).
- Reduction in consumer complaint and attending it within 48 hrs.
- Improved Satisfaction for stakeholders.
- Implementation of successful experience in other parts of the city.
Performance Contract for Operator

• **Ufw** : Cut off Ratio 60-70% for Bonus/Penalty
• **Billing** : Bonus for additional billing over baseline
• **Pressure** : Penalty for not maintaining the prescribed Pressure at minimum 10 observation points for cont. 24 hrs
• **Quality** : Penalty on Failure to meet the desired chlorine level.
• **Customer Complaint** : Penalty on unsolved complaints within 3 working days.
UN-INTERRUPTED WATER SUPPLY: PAYMENT AND PERFORMANCE

• Payment terms are as follows
  – Technical Services (lump sum)
    • 50% fixed in equal installment in 74 months.
    • 50% based on milestone achievement.
  – Rehabilitation Work (As per measurement)
    • As per measurement of actual quantity executed.
  – Bonus / Penalty ( % over & above lump sum)
    • Increase in billed quantum
    • Reduction in UFW
    • Reduction in consumer complaint
    • Cost benefit target
Pench-I WTP Up gradation :PPP model

• WTP
  – rated capacity : 113 mld
  – Actual Operating capacity : 95 mld
  – Age : 25 years

• Objective
  – Upgrade to 136 mld
  – Rehabilitation /Replacement of equipments for additional 10 years of service
  – Improvement of energy efficiency

• Model for private participation
  – 70% grant from JNNURM
  – Balance from Operator’s investment
  – Technology for upgradation by operator
  – Operator to recover by efficiency improvement and upgradation of plant
  – Plant O & M for minimum 5 years for repayment of operator’s investment.
  – Monthly payment (Fixed Charges + variable charges) +/- Performance linked Bonus/Penalty
North Zone STP : PPP Model

• Existing Central Zone STP
  – 100 mld operates at 70 mld
  – NMC repay the loan on capital cost taken for construction.
  – NMC to spend 4 – 5 crore/ annum for O & M

• Proposed PPP Model for North Zone STP
  – 70% grant from JNNURM
  – Balance investment from Mahagenco (Power generation company)
  – Plant will be operate by Mahagenco for 30 years.
  – Mahagenco will pay 4-6 Crore /year for 30 year to NMC for raw sewage of 110 mld
  – Mahagenco will use treated sewage for power plant (2x800 MW)
  – Agreement between NMC and Mahagenco is finalised.
Projects in Pipe Line for PPP

- Pench – IV for built and long term O & M contract
- Kanhan with DBO, 10 years performance based operating contract for 120 mld WTP
- Consumer meterisation & Billing
- Water distribution concession agreement for O & M, Service to consumer, billing, recovery and investment from operator. The agreement proposed for 15-20 years.
THANK YOU