

24 X 7 Water Supply Project for Nagpur City



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Context

- Continuous water supply is notified as a service level benchmark at the national level
- PPP is promoted in water and sanitation sectors – for efficiency and investment goals

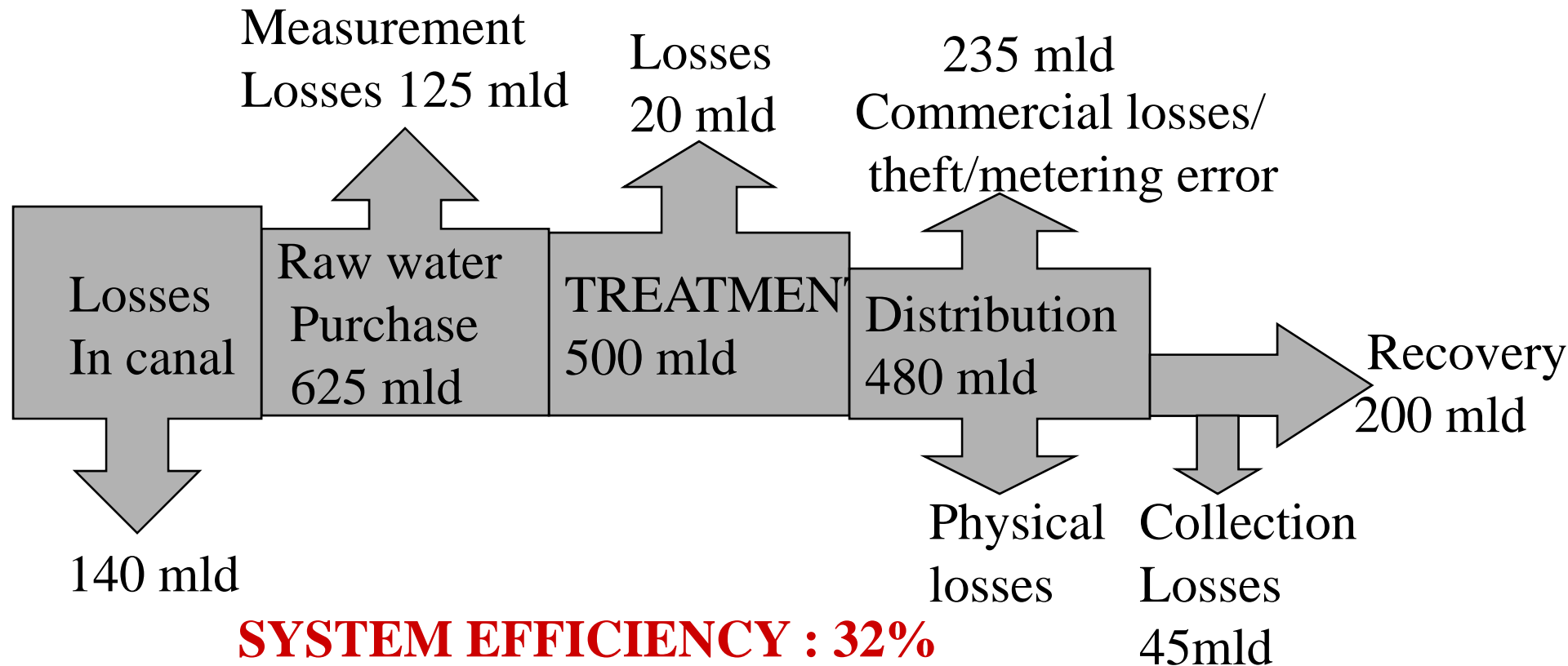
Benchmarks : Water Supply

Proposed Indicator	Benchmark
<i>Coverage of Water Supply Connections</i>	<i>100%</i>
Per capita availability of water at consumer end	135 lpcd
Extent of metering of water connections	100%
Extent of non revenue water	15%
<i>Continuity of Water Supply</i>	<i>24X7</i>
Efficiency in redressal of customer complaints	80%
Adequacy of Treatment and Disinfection and Quality of Water Supplied	100%
<i>Cost recovery in water supply services</i>	<i>100%</i>
Efficiency in collection of water supply related charges	90%
Number of persons receiving less than 70 lpcd	0%

Key requirements for 24x7

- Efficiency of usage at the system level and at the consumer level
- Managerial and technical competencies to manage the system
- Desire and awareness on 24x7

NAGPUR WATER SUPPLY: Status before JNNURM



SYSTEM EFFICIENCY : 32%

Annual Loss (W/O Dep): Rs 56 crore

With Depreciation : Rs 75 crore (appx)

Water sector Challenges: NMC

- 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.

Water production vs hours of supply

Cities	LPCD	Hrs. of Water supply
Goa	341	8
Mumbai	240	5
Delhi	220	4
Agra	220	4
Hubli-Dharwad	124	3
Ajmer-Pushkar	140	1-1.5
Vijayawada	157	4
Hyderabad	162	2
Surat	195	2-3hrs
Nagpur	200	4
<i>France</i>	<i>156</i>	<i>24</i>
<i>UK</i>	<i>135</i>	<i>24</i>
<i>Kaula Lumpur</i>	<i>132</i>	<i>24</i>
<i>Colombo</i>	<i>119</i>	<i>24</i>
<i>Dakar, Senegal</i>	<i>90</i>	<i>24</i>
<i>Jakartha</i>	<i>80</i>	<i>24</i>

Strategy For Achieving 24x7 WS

Water Audit

Identification of the Water Losses (Technical & Commercial)

Leak Detection in Bulk water system (Supported by JNNURM)

- Installation of Flow Meters (Supported by JNNURM)
- Reduction in Raw water transmission losses (Supported by JNNURM)

Pilot & DMA for Leak Detection

Pilot of 24x7 water supply project to reduce UFW in Distribution System (Supported by JNNURM)

DMA for leak detection plan to identify the causes (Supported by JNNURM)

Full City Rehabilitation Plan

Rehabilitation Plan Based on Water Audit and Pilot /DMA studies (Submission of this report to JNNURM)

O & M Strategy for Sustainability

Rationalization of Tariff for cost recovery (Revised by General Body)

PPP for Technical & Commercial Efficiency through 25 years O & M lease contract (EOI received from 10 prospective bidders)

24x7 Pilot Project

- Feature
 - 15000 Connection including slum
 - 10 slum areas
 - Population 1.5 – 1.75 lakhs
- Contract
 - Study, Rehabilitate, Operate contract with Private operator.
 - Penalty /bonus for targets in UFW, Quality, Customer services and Continuity of supply



Pilot 24x7 Project :Baseline for Private Operator

KPI	Baseline KPI	Target KPI
UFW level	The NRW is assessed at 50%	UFW below 30% for proportionate bonus
Increase of volume billed compared to FY 2007-08	Volume billed for FY 2006-07 = 21,7 MLD on average. This value shall be used for the cost-benefit analysis of the rehabilitation plan. The baseline KPI for the assessment of bonus/penalties during O&M will be based on FY 2007-08 data.	Higher than baselines by 10% for bonus
Continuity of supply	2 to 24 hours depending on the area of supply	24/7 throughout the zone with minimum 2m pressure at customer tap
Water Quality	63% of samples tested had a residual chlorine level higher than 0,2 ppm	Residual chlorine higher than 0,2 ppm
Time for handling customer complaints	Not applicable	Within 3 days



Rehabilitation Plan for Pilot 24x7

- Replacement of 100% House service connection & Meters
- Replacement of old conservancy GI pipe
- Rehabilitation of Tertiary network
- Hydraulic modeling as per Master plan
- Installation of new billing system



Visible Project Benefits

- Water Supply Hours
 - Water supply hours was increased from 4.30 hours to 24 hours
- Water Consumption:
 - The water consumption was 440m³/day for a Bajiprabhu nagar with 4.30 hrs has increased to 24 hrs with 504m³/day of water consumption. With telescopic tariff and billing as per consumption will reduce.
- Pressure :
 - Before conversion the average pressure at consumer water taps was 2-5 meters and now it reaches to 10-12 m. It resulted in to energy saving for consumers as water reaches directly to overhead water tank.
- Quality:
 - The continuous pressurized network has avoided the contamination of water from leaking House service connections which were replaced under this project.



City Wide Scale up

Estimated Cost and Funding

- Total cost – Rs 387.86 crores
- JNNURM funding (50%) – Rs 193.94 crores
- Govt. of Maharashtra (20%) – 77.57 crores
- Private sector (30%) – Rs 116.35 crores

PPP Approach

- The PPP approach aimed at BOT/Lease Concession for 25 years
- Private operator would undertake necessary investments for system upgradation and operates and maintains the system

PPP Process

- Issuing of Request for Qualification – August 10 2008
- Shortlisted 10 firms/consortium
- RFP issued on April 6 2009
- Bid security for an amount of Rs 4 crores

Selection of Bidder

- Two stage process
- First stage - a technical proposal including methodology and work plan, letter of bid, bid security, qualification of bidder and any other information.
- No financial information.
- Short-listing of bidders
- Meeting with bidders

Selection of Bidder

- Second stage bid will be issued to the qualified bidders of the first stage
- Includes a technical proposal comprising of final work plan and methodology and a financial proposal.
- Evaluation will include a technical and economic evaluation.
- Selection on the basis of lowest evaluated price.

ASCI Support

- Vetting of RFP and contract document
- Modifications to certain provisions in contract - bill collection, employees, complaint redressal etc.
- Initially the operator was made responsible for direct collection of revenues and disconnection but this was amended as the act did not permit
- Improved understanding on relationship between NMC and NESL
- The mechanisms for support and monitoring of NESL are still being worked out in the form of MOU.

ASCI Support

- Orientation workshop for elected representatives and civil society
- ASCI has suggested for sharing of RFP and contract with public – through web site
- A key outcome of orientation workshop was the demand by all sections for undertaking an impact assessment of 24X7 pilot initiative through PPP
- The NMC has appointed Veolia Water to provide 24X7 water supply in a pilot zone in 2007
- All stakeholders requested for an impact assessment by a third party to bring lessons for city wide initiative.
- NMC has requested ASCI to undertake the study
- ASCI has completed the study and brought out impact and key lessons based on primary and secondary data and focus group discussions

Impact Assessment of Pilot Initiative - Lessons

Pilot Initiative - Objectives

- Provide consumers with uninterrupted water supply at desired pressure.
- Reduce UFW to a level below 30% by reducing leakages and unmeasured supply.
- 100% metering with good quality meters having long life spans.
- Improve billing mechanism (reading, bills generation & distribution) to reduce time & cost per bill including spot billing.
- Provide better services to urban poor by implementation of slum policy.
- Attend consumer complaints within three working days.
- Improve satisfaction for stakeholders.
- Implement good engineering practices to upgrade existing network.
- Bring accountability on design, implementation, and O&M with single agency through performance based contract and Bench Marking of Services.
- Implement the lessons learnt from the pilot zone to other parts of city.

Pilot zone - components

- Implemented UWS pilot project through PPP framework in Dharampet zone covering an estimated 15000 house service connections.
 - 100 percent metering
 - Rehabilitation of tertiary network
 - Hydraulic modeling as per master-plan
 - Installation of new billing system
 - Customer facility centre

Pilot Project - Scope

Phase 1 – 9 months

- Establishment of baselines parameters
- Preparation of a rehabilitation plan
- Procurement of customer meters and starting of replacement of consumer meters and house service connections.
- Approval of the rehabilitation plan.

Pilot Project - Scope

Phase 2 – 15 months:

- Implementation of the rehabilitation plan and replacement of customer meters and House Service Connections.
- Take over of O & M.
- Take over of customer service management.

Phase 3 – 60 months:

- Operations and maintenance for five years. (Performance based contract)

Pilot zone - Key Performance Indicators

KPI Definition	Baseline KPI	Target KPI
UFW level	The Baseline UFW can not be calculated accurately at this stage. However, the NRW is assessed at 50% (refer section 6)	UFW below 30% for bonus
Increase of volume billed compared to FY 2007-08	Volume billed for FY 2006-07 = 21,7 MLD on average. This value shall be used for the cost-benefit analysis of the rehabilitation plan. The baseline KPI for the assessment of bonus/penalties during O&M will be based on FY 2007-08 data.	Higher than baselines by 10% for bonus
Continuity of supply (pressure higher than 2 m continuously)	2 to 24 hours depending on the area of supply with 4 meter pressure on average during hours of supply	24/7 throughout the zone with minimum 2m pressure at customer tap
Water Quality	63% of samples tested had a residual chlorine level higher than 0,2 ppm	Residual chlorine higher than 0,2 ppm everywhere
Time for handling customer complaints	Not applicable	Within 3 days

Project Financing

S. No	Description	Sanctioned expenditure as on 30-04-2007 (Rs)	Percentage	Revised sanctioned expenditure as on 03-02-2009 (Rs)	Percentage
A.	Technical Services				
1	Study phase	24360000	11.00	24360000	9.00
2	Rehabilitation phase	24951000	12.00	24951000	9.00
3	O&M phase	41526000	19.00	41526000	15.00
	Total of 1, 2 and 3	90837000	42.00	90837000	33.00
	Service tax	11227453	5.00	11227453	4.00
	Total of A	102054453	48.00	102054453	37.00
B	Rehabilitation cost including cost of extra items	111995251	52.00	174995735	63.00
	Total of A and B	214059714	100	277060188	100

Study Objective

- Assess the effectiveness of 24X7 pilot initiative and the PPP approach and their impact on enhancing service delivery and customer satisfaction.
- Verify on the ground results of the pilot prior to embarking on a city wide initiative and to provide lessons for the citywide 24X7 water supply project

Achievements of the Pilot Project on KPIs

Moved favorably

Continuity of Supply and Pressure

- Achieving the objective of uninterrupted water supply – About 50 % of targeted customers – about 7500 connections
- The remaining connections is expected to be provided with continuous supply by 2010
- The operator has completed the work related to replacement of pipe lines, metering and house service connections – *entire demo zone*
- The implementation of technical works related to rehabilitation are considered to be of international standards in terms of both material and equipment.
- NMC is yet to complete inter related works for covering the remaining connections
- Required water supply pressure is achieved in all the areas (*PMC survey and ASCI field validation*)

Increase in Billed Volume

- The billed volume has increased from around 22 MLD before the project to 33 MLD by March 2010 (exceeded KPI).
- The billed volume was expected to increase only by 10 percent over the base line but it has exceeded the same
- This reflects the increased access (especially to the poor) and availability of water
- *This could partly include leakages at the customer end post meter*

Decline in Non Revenue Water

- The NRW is stated to have come down from 50 percent to 38 percent.
- The operator has installed bulk meters to measure the input volume while the billing data has provided the billed volume.
- The envisaged reduction in NRW is 30 percent during the third year
- The reduction in NRW could be attributed to accurate meter reading and billed volume, reduction in illegal connections and PSPs.

Customer Services

- A dedicated civic centre was established in August 2009. The civic centre is in the process of establishing complaints registration and redressal, bill generation and bill collection systems.
- For bill generation a software is developed which generates a form for meter reading. This is initiated only recently
- Bill collection is done at the customer centre. A manual receipt is given to the customer and the cash along with demand collection register is submitted to the NMC on the same day. Bill collection data is entered into computer and updated.
- A complaint redressal system is put in place where the complaint is recorded (in person or over phone) and reference number is given.
- *Bill generation is just started, bill collection is done through other places (banks), and complaint redressal is not widely publicized and made effective.*

Enhanced Services to the Poor

- Effective implementation of slum policy
- Increased coverage and access – provided nearly 5000 free connections
- The quantity of water and billed consumption to the poor has gone up
- The non-revenue water due to illegal connections and PSPs has come down
- Water tariff for poor has declined and became more affordable.
- 24*7 water is not available to the poor in many slums.

Perceptions of Households (*HH survey and Discussions*)

- Coping costs have come down related to storage and electricity
- The practice of attaching motor pumps to taps in tail end areas has also come down due to increased pressure.
- Improvement in meter reading and billing based on working meters
- Average amount of monthly bills have come down for slums
- Improvement in pressure in non-slum areas
- Better and regular information to slum households and better satisfaction among them

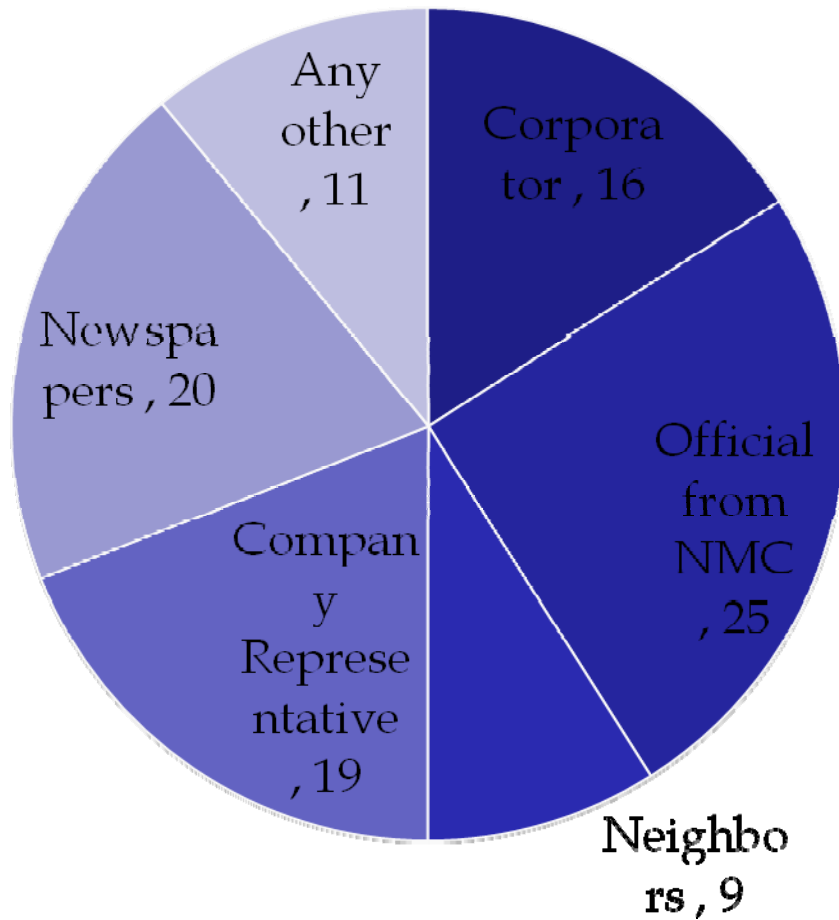
Key Gaps

Lack of IEC Strategy

- Lack of adequate preparedness and IEC strategy
- Customers were not fully informed about potential leakages inside the premises and the remedial measures needed.
- Some customers have also expressed concern with regard to the process of installation of meters.
- They opined that all meters should not have been replaced but only non-working meters should have been replaced.
- Works related to road cutting and restoration appeared to be not at all satisfactory.

Information and Transparency

Were the people well informed about the initiative?



Water Consumption and Billing Issues

- Increase in leakages at customer end due to leaking pipelines and storage sumps at the customer end (post meter). This has resulted in increase in customer bills.
- NMC has substantially revised its tariff for domestic and non-domestic consumers after initiating the 100 percent metering under the 24X7 project.
- The tariff increases has significantly increased the water bill across the city but more significantly in the pilot project.
- Delay in issue of bills by NMC by more than six months due to elections to the state legislature and the council.
- The consumers have got two to three bills at one go with increased meter reading and increased tariff.
- This whole process had a cascading effect and resulted in increase in bills by three to four times.

Perceptions of Households

- Uninterrupted supply not available to all
- Not much improvement on aspects related to primary source, frequency of water supply and working meter status
- No regular and adequate information in non-slum areas
- Meter reading and bills have gone up by two to three times in non-slum areas
- Increase in complaints mainly related to metering and billing
- Decline in satisfaction on water supply
- More number of people in slum areas recommend continuous water supply as compared to non-slum areas

Observations from FGDs

- Non-availability of adequate information
- Dissatisfaction with meters
- Increased meter reading and billing
- Concerned about leakages
- Limited hours of supply and less pressure in slum areas
- Good supply even before the initiative
- Concerns about UWS and PPP

Project Structuring Issues

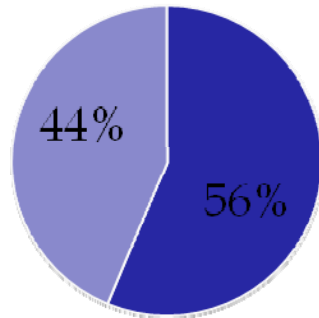
- Contract not well defined and structured
- Roles and responsibilities not defined
- Risk assessment and mitigation not undertaken
- Works oriented approach and absence of partnership approach
- Lack of preparedness and IEC
- Citizen participation and consultation not adequate – during the preparatory phase

Recommending 24x7 to other areas

Do the people recommend it in other parts of Nagpur?

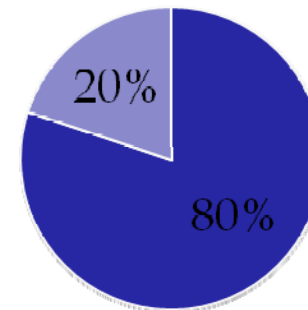
Non slum

- Recommended
- Not recommended



Slum

- Recommended
- Not recommended



Key Lessons

Steps by NMC

- The NMC has already revised tariffs and reduced the rates for all categories – pending with the state for approval.
- As an interim measure the NMC has decided that all the consumers with above 50 units of consumption would be charged only for 50 units.
- Customer consumption survey and awareness activity – the operator has identified nearly 1600 customers with above 50 units of consumption and has undertaken a customer consumption survey.
- Teams have visited these customers to identify the reasons for high consumption and suggested remedial measures.
- Nearly 80 percent of households have been covered in the past two months under this programme.

Lessons for City Wide Initiative

- Comprehensive documentation including then DPR and contract document. Sharing and vetting of documents with experts and civil society groups to create awareness and understanding and also incorporate their concerns.
- Introducing a Customer Relations Strategy and Awareness Campaign much before the project by an independent agency with adequate expertise.
- Addressing the leakages at customer end, post-meter - survey needs to be conducted to identify the leakages and the corrective measures needed.
- The consumer should be educated about these measures and should be provided handholding support for implementation

Lessons for City Wide Initiative

- There should not be any charges towards metering.
- Need to undertake *tariff rationalization study*. Designing of tariffs based on a rational tariff policy with the objectives of equity, sustainability and cost recovery in consultation with the citizens.
- The slum policy was implemented with a flat rate and without metering in the demo zone. In city wide approach, slum household may need to be provided with metered connections and in such a case a pro-poor pricing policy of providing lifeline block should be adopted.