Urban Rehabihabilitation with Water Supply and Sanitation

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Coverage

- Overview of Water and Sanitation
- Urban Restoration
- Urban Re-distribution
- The Missing Links
- Roadmap

Overview of Water and Sanitation

- Mutually Linked
- SBM:Need to ensure water for sustainable ODF
- Cape town –Problem caused by Drought
- Focus on Restoration and Re - distribution
- Restoration-Harvesting, Conservation
- 80% water goes to drains
- Redistribution-Recycling ,Treatment ,Revival of Waterbodies

Urban Challenges in Supply

- Water Losses and UFW
- Equitable distribution –low supply
- Accountability-upward
- Water to Slums (inefficient tanker system)
- Water network coverage and inadequacy of network
- Un-authorised /Illegal land development
- Water supply management during summer peak demand

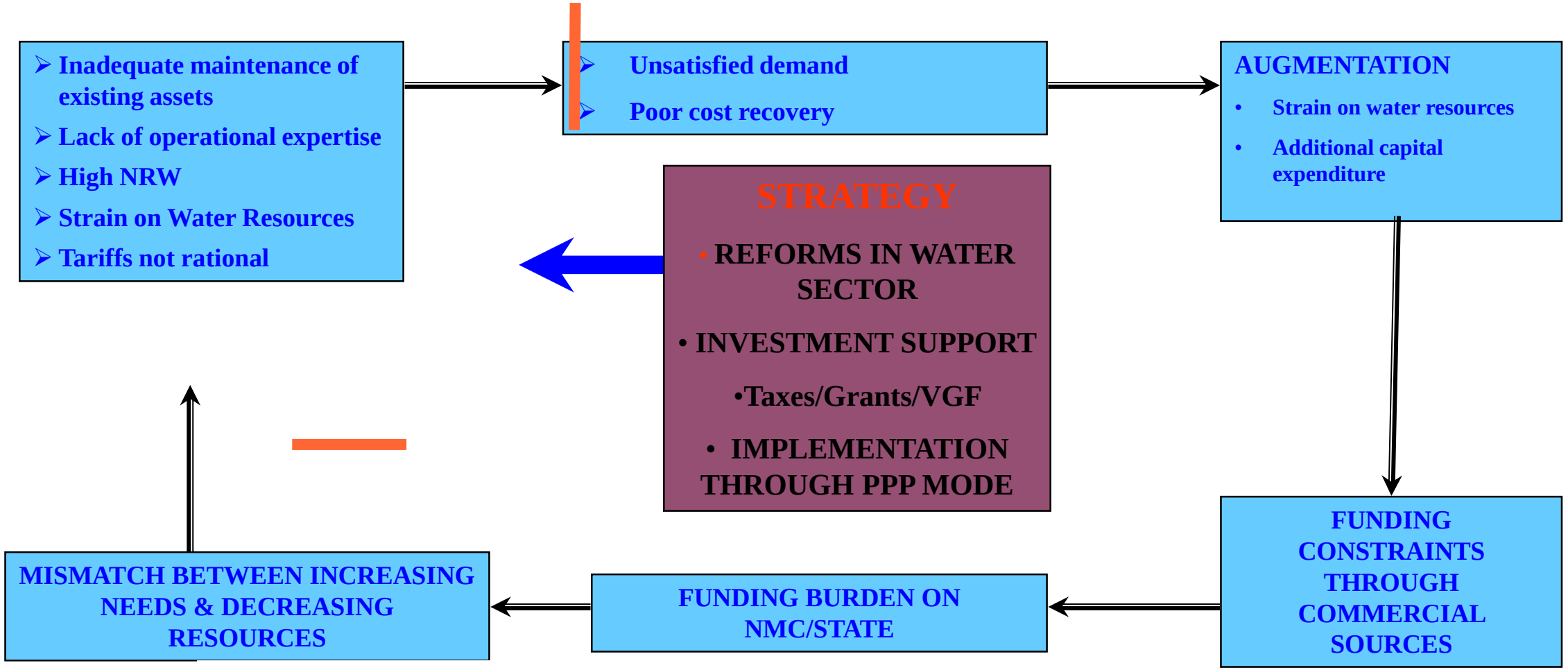
Urban Challenges in Supply

- Delay in capacity augmentation for future demand from Limited water sources.
- Old and inefficient assets-Lack of replacement and repair
- Fiscal Stress-Capital availability
- Low water tariff and Poor billing mechanism.
- Lack of professional approach

Urban Challenges in Supply

- Absence of Drainage Plan –Most Cities
- Open Dumping-Overwhelming : Bengaluru Lakes
- Impact on Water bodies
- River with low water level-Drain- Ahmedabad,Pune
- Mixing of Sewage and Drains-Most Cities

Policy options



Nagpur –Case Study

- Fixing of Benchmarking and Performance indicators through Water audit, Energy audit & Financial reforms.
- NRW reduction program with investment plan
- Assets Up gradation 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 / Smart City Mission/ Tax free bonds/ PPP
- Performance based contract with 5 to 25 years of O & M with 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

NAGPUR CASE STUDY

Water & Energy efficiency Project

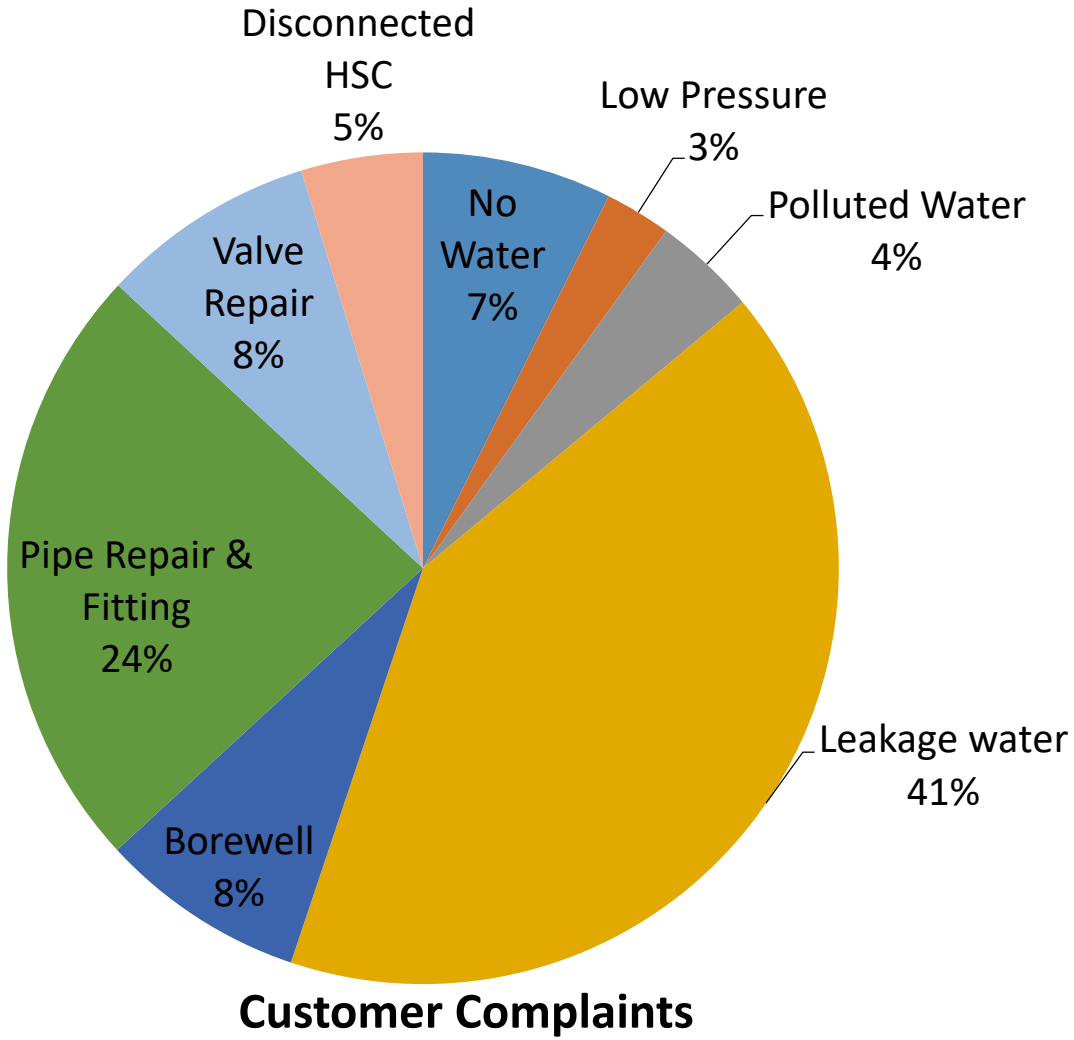
i. Reduction in NRW by 100 mld-Rs 2 Crores p a
ii. Water Audit & Leak Detection Phase-I of Rs. 28.0 Crore.
iii. Energy Efficiency Program of Rs 25.00 Crore.
iv. Up gradation & Expansion of Distribution Network of Rs 43 Crores-100%

coverage of piped water network

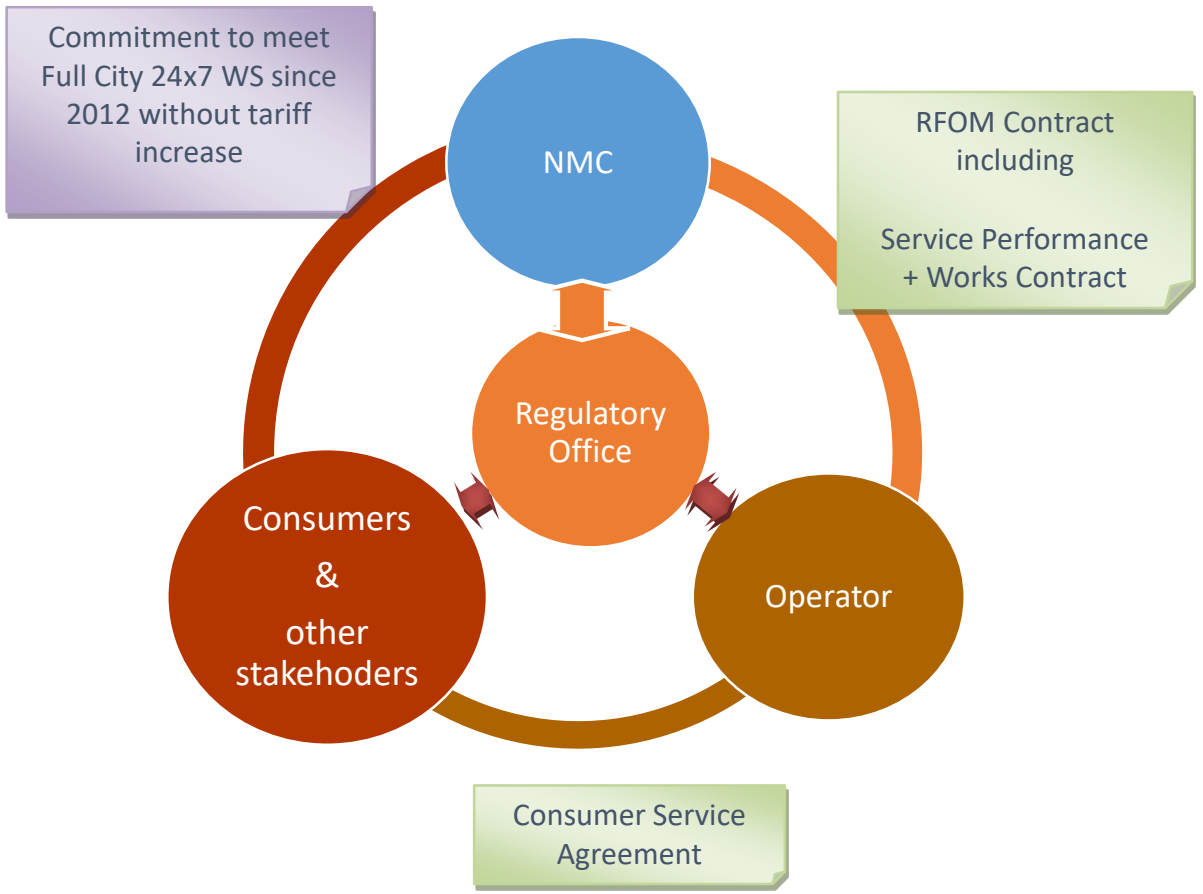
NAGPUR CASE STUDY

- Water Tariff for full cost recovery for sustainable water business.
- Subsidized Tariff to Urban poor and low domestic consumption 55 lpcd
- Tariff at cost for domestic consumption up to 135 lpcd
- Premium Tariff for domestic consumption beyond 135 lpcd and non domestic usage
- Indexation with raw water and energy charges. It enable to pass additional cost (70% of operating expenses) directly to consumer as surcharge.
- Tariffs are sufficient to meet Operating expenses and repay the loan for Jnnurm Projects
- Earning will be better with operational efficiency and reduction in Non Revenue Water.

Review of NMC Maintenance Record



SPV Regulatory Framework: Accountability and Mission of the Regulator



Regulator to

- Ensure consumers receive **expected level of service at reasonable cost**
- **Protect short term and long term interests of the Consumers**
- Provide **certainty for public and private investment**
- Enhance **accountability and transparency**
- **Control the financial performance**

The Regulatory Office set-up

- **Regulatory Office set as an SPV created by the NMC.** The participation of other stakeholders in the constitution of the SPV may be envisaged.
- **Initial set up and annual operating budgets approved by the Parties chargeable to the Operating Cash Flow.**
- **Regulator appointed for 5-year contract extensible.**
- **Regulator personally accountable for prejudice to the Parties.**
- **Key Staff selected on the basis of merit references.**
- **Public access to all resolutions and statements of the Regulator on the RO Web Site.**

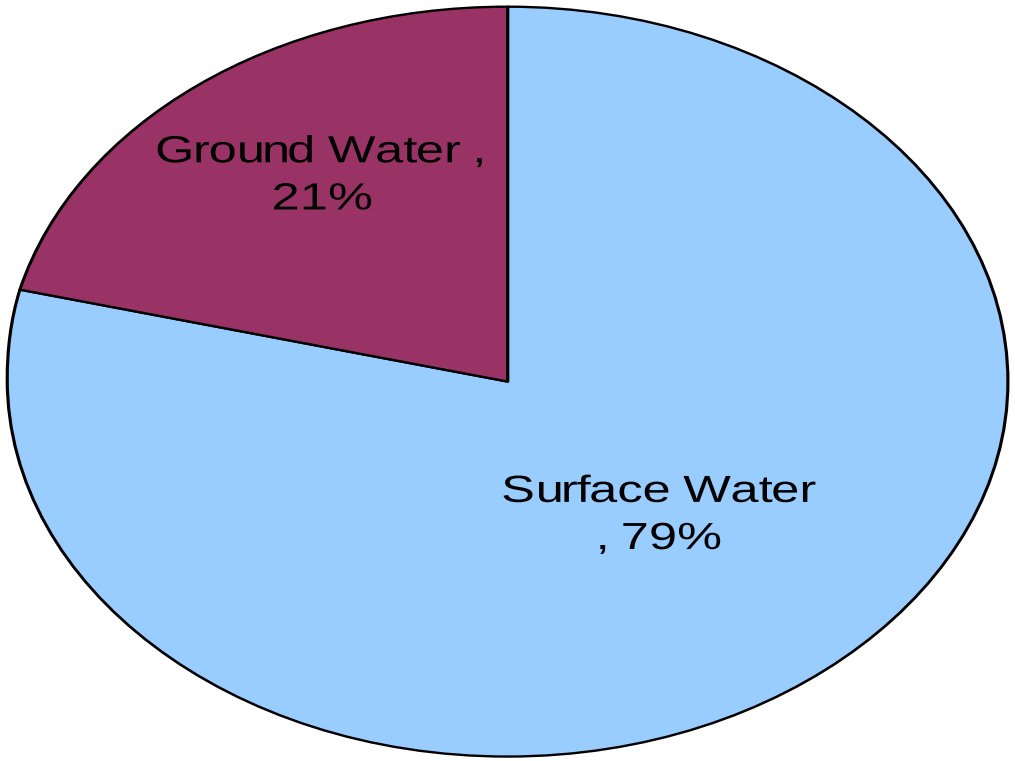
Revival of Waterbodies

- Ahmedabad
- SRFDC
- SPV
- Rehabilitation of affected persons
- Affordable housing
- Income generation
- Workplace Relationship

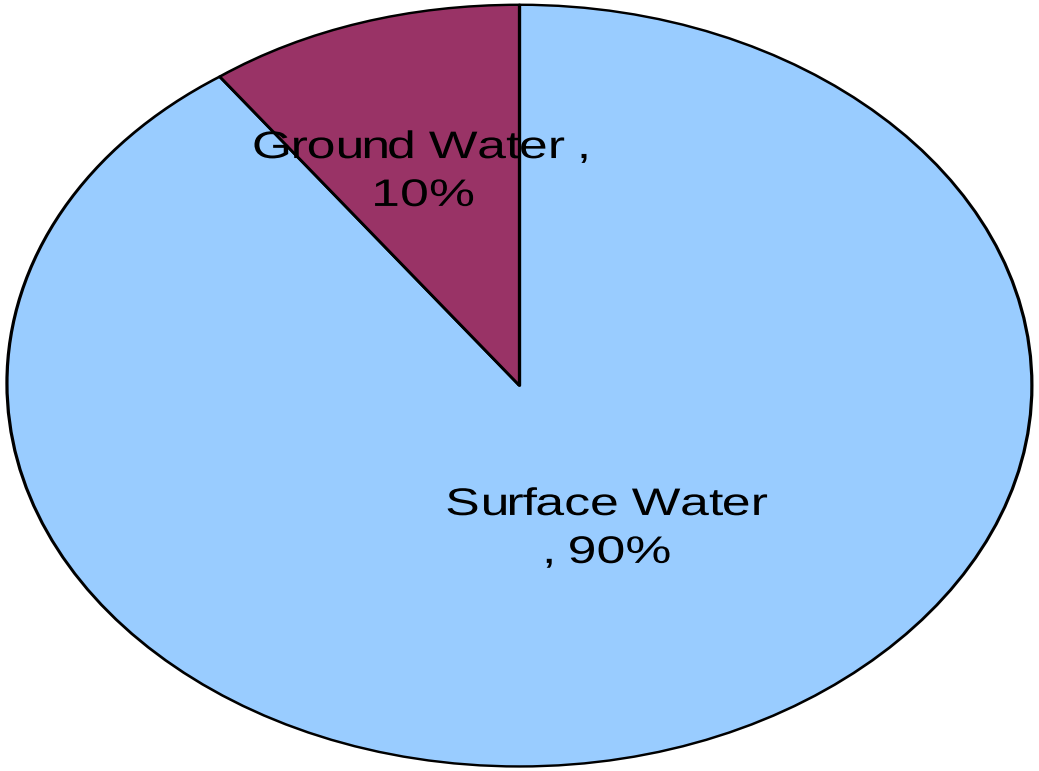
Non Revenue Water

- **Transportation losses, Water Theft.**
- **Free of Cost Water Supply to Slum area & other Wastages.**
- **Worldwide Average 30 % is NRW.**
- **AMC NRW is reduced 25% to 27% in Last Five Years.**
- **Leakage in Distribution System**

Ground Water and Surface Scenario in last 30 years



2000 - 2006



2006-2015

Efforts towards Wholesome water

- **Increase dependency on surface water instead of ground water.**
- **Reduction in NRW through water audit.**
- **Equitable water distribution through implementation of SCADA system.**
- **Energy audit for deduction in energy cost.**
- **Training to Departmental / Organization staff for better performance.**
- **IEC activities for public awareness.**
- **Efficient and economical adoption of Global technology.**
- **Time to Time implementation for reforms is must.**
- **Implementation of 24x7 water supply system instead of intermediate water supply.**
- **Recycle & Reuse of sewage**

Water Quality of AMC

The drinking water quality standards are maintained as per IS 10500. The analysis results are given below,

Parameters	Actual	W.H.O. Standards
pH	7.20 – 7.80	6.50 – 8.50
Turbidity, NTU	0.50 – 1.50	1 – 5
Alkalinity, mg/L	120 – 200	300 – 600
Total Hardness, mg/L	80 – 280	300 – 600
Calcium as (Ca^{++}), mg/L	190 – 320	70 – 200
Magnesium (Mg^{++}),mg/L	20 – 60	30 – 100
Chloride Cl^-, mg/L	65 – 310	250 – 1000
Sulphates (SO_4), mg/L	12 – 35	200 – 400
TDS, mg/L	120 – 300	500 – 2000

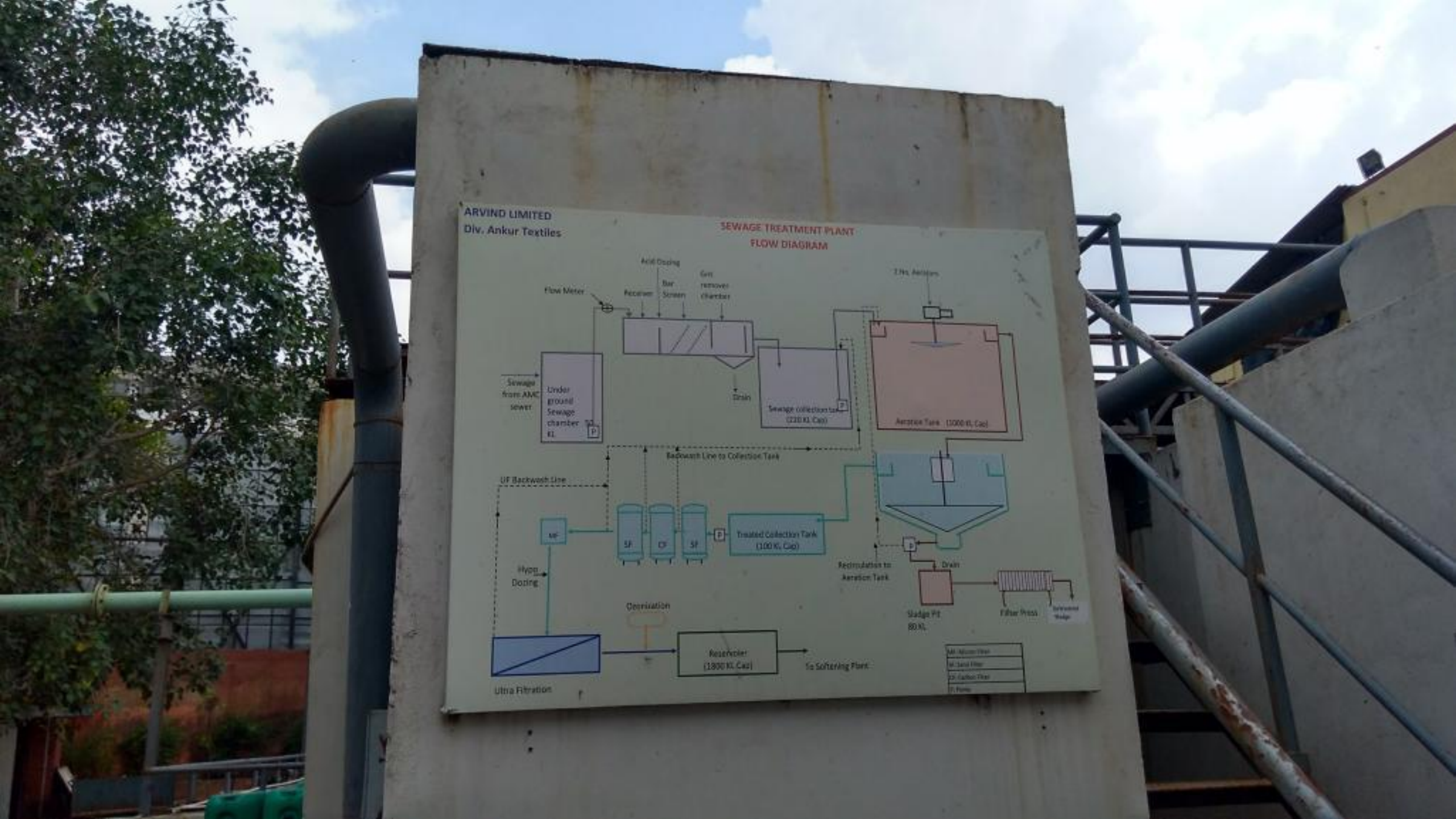
- 97.80% of samples do not contain any coliform organism.
- At consumer end point Residual free chlorine AMC maintains 0.2 ppm.

Water Quality

- AMC ensures quality Water Supply to Citizens.
- Disinfection Treatment through Gas Chlorination Plants at water Distribution Station and Dozers (287 Nos.) at isolated Borewells.
- Chlorine content and Quality of Water measured daily and data published in News Paper on quarterly basis and also available on website.

Ahmedabad Innovations

- Arvind Mill STP-Rs 7 KL as against municipal purchase Rs 8
- Sabarmati Riverfront Development Corporation
- Kankaria Lake Development -PPP


ARVIND LIMITED
Div. Ankur Textiles
SEWAGE TREATMENT PLANT
FLOW DIAGRAM
Acid Dosing
Flow Meter
Receiver
Bar Screen
Grit remover chamber
2 Nos. Aerators
Sewage from AMC sewer
Under ground Sewage chamber 50 KL
Drain
Sewage collection tank (210 KL Cap)
Aeration Tank (1000 KL Cap)
Backwash Line to Collection Tank
UF Backwash Line
UF
SF
CF
SF
Treated Collection Tank (100 KL Cap)
Recirculation to Aeration Tank
Drain
Hypo Dosing
Chlorination
Sludge Pit 80 KL
Filter Press
Reservoir (1800 KL Cap)
To Softening Plant
Ultra Filtration


80
60
40
20
0
20

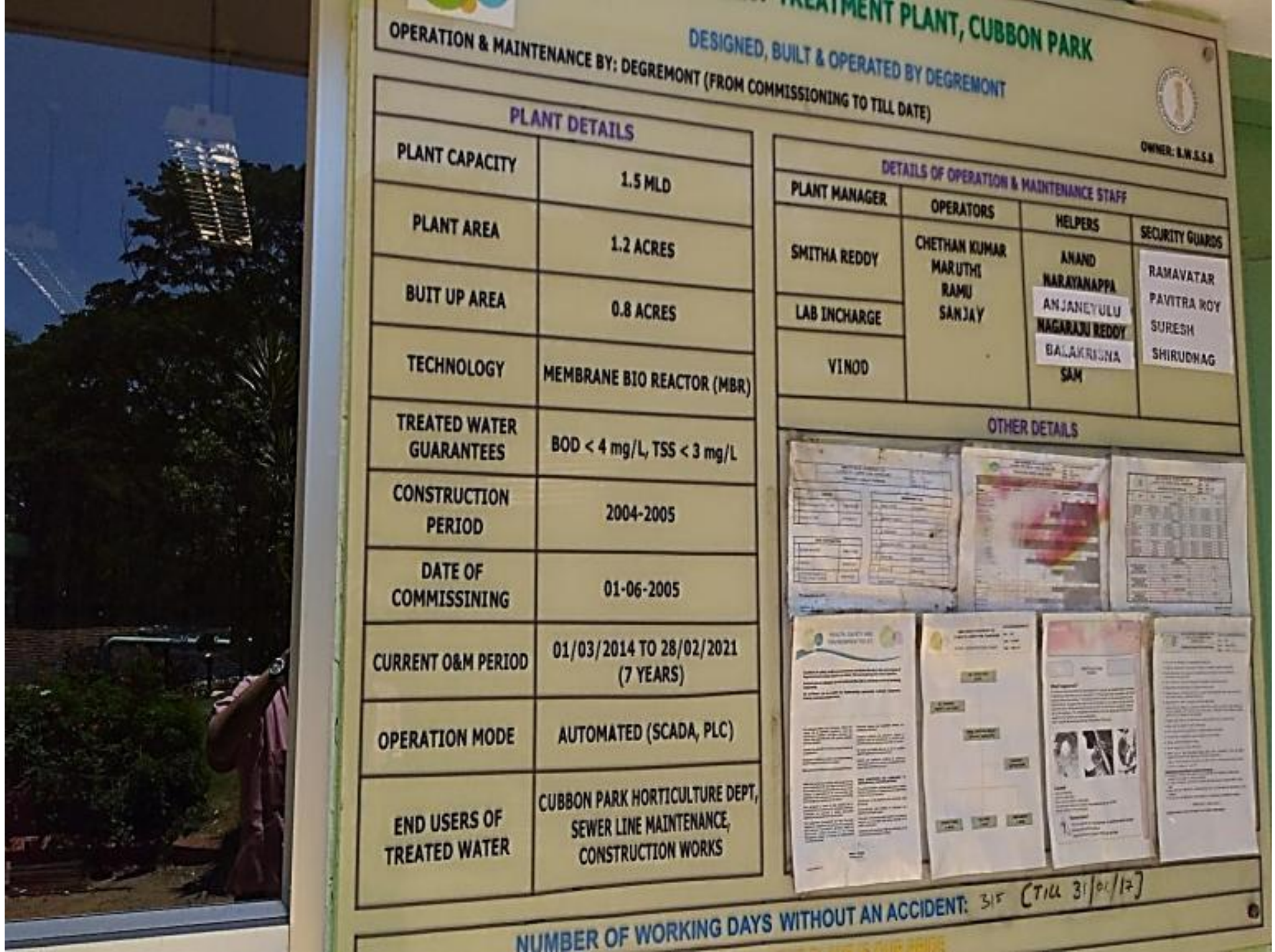
Sabarmati River before the Project

Bengaluru-Case Study

- Cubbon Park-Decentralised treatment
- Neighbourhood level treatment
- Revival of lakes
- RWH –good record
- Still scope is wide


THIS PLANT IS OUR PRIDE
ANT
ORATORY
ಸಾರ್ವಜನಿಕ ಜಾಗೃತಿ ಕೇಂದ್ರ
PUBLIC AWARENESS
CENTRE
TOILET
SAFETY : OUR PRIORITY


RAW SEWAGE
WET WELL



TREATMENT PLANT, CUBBON PARK

DESIGNED, BUILT & OPERATED BY DEGREMONT

OPERATION & MAINTENANCE BY: DEGREMONT (FROM COMMISSIONING TO TILL DATE)

OWNER: B.W.S.S.B

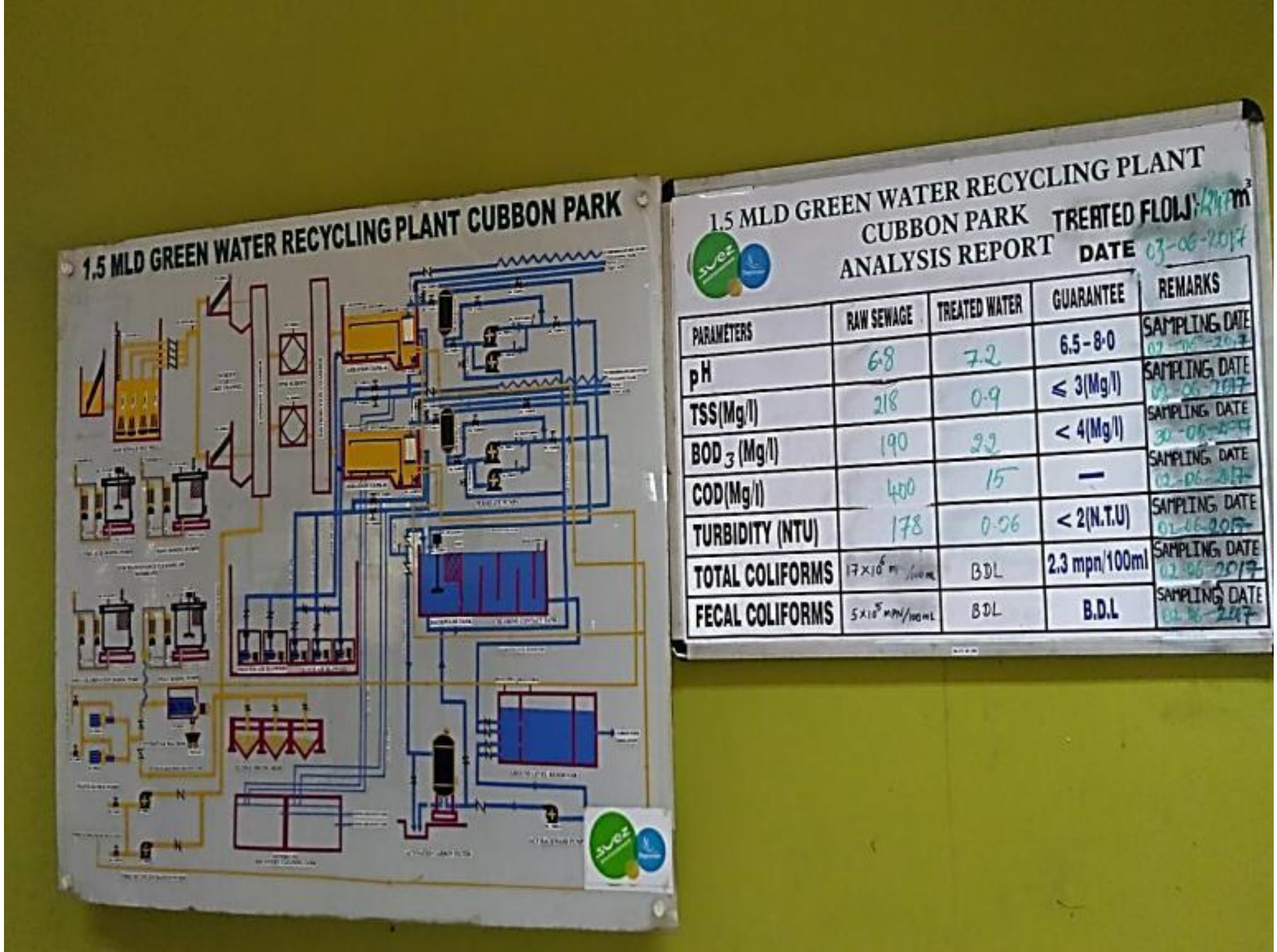
PLANT DETAILS	
PLANT CAPACITY	1.5 MLD
PLANT AREA	1.2 ACRES
BUIT UP AREA	0.8 ACRES
TECHNOLOGY	MEMBRANE BIO REACTOR (MBR)
TREATED WATER GUARANTEES	BOD < 4 mg/L, TSS < 3 mg/L
CONSTRUCTION PERIOD	2004-2005
DATE OF COMMISSINING	01-06-2005
CURRENT O&M PERIOD	01/03/2014 TO 28/02/2021 (7 YEARS)
OPERATION MODE	AUTOMATED (SCADA, PLC)
END USERS OF TREATED WATER	CUBBON PARK HORTICULTURE DEPT, SEWER LINE MAINTENANCE, CONSTRUCTION WORKS

DETAILS OF OPERATION & MAINTENANCE STAFF

PLANT MANAGER	OPERATORS	HELPERS	SECURITY GUARDS
SMITHA REDDY	CHETHAN KUMAR MARUTHI RAMU SANJAY	ANAND NARAYANAPPA ANJANEYULU NAGARAJU REDDY BALAKRISNA SAM	RAMAVATAR PAVITRA ROY SURESH SHIRUDHAG
LAB INCHARGE			
VINOD			

OTHER DETAILS

NUMBER OF WORKING DAYS WITHOUT AN ACCIDENT: 315 (TILL 31/01/17)



PARAMETERS	RAW SEWAGE	TREATED WATER	GUARANTEE	REMARKS
pH	6.8	7.2	6.5 - 8.0	SAMPLING DATE
TSS(Mg/l)	218	0.9	≤ 3(Mg/l)	SAMPLING DATE
BOD_3 (Mg/l)	190	22	< 4(Mg/l)	SAMPLING DATE
COD(Mg/l)	400	15	—	SAMPLING DATE
TURBIDITY (NTU)	178	0.06	< 2(N.T.U)	SAMPLING DATE
TOTAL COLIFORMS	17×10^6 mpn/100ml	BDL	2.3 mpn/100ml	SAMPLING DATE
FECAL COLIFORMS	5×10^5 mpn/100ml	BDL	B.D.L	SAMPLING DATE

Sum up

- Water and Sanitation - two sides of same coin
- Water restoration and Redistribution hold the key
- High Externalities
- Fiscal and managerial reforms-NRW,O&M and outreach
- Urban is crucial-Economy of scale and massive demand