TATA PROJECTS
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TATA

Restoration of Dravyavati River in Jaipur, Rajasthan




30th January 2020

Preview

I Video of Dravyavati River Rejuvenation

II Conventional Approach Vs Tata Model

III Dravyavati Project Brief

IV Challenges from Policy Perspective

V Suggestions

Client: Jaipur Development Authority

Contract Value: INR 1676 Cr.

Funding : NCRPB

Procurement: SWISS Challenge

Project Duration: 30 Months + 10 years O&M

PROJECT SCOPE: 47.5 km long Dravyavati River Rejuvenation Project worth $250 Million

Transformation

Before Project Implementation (Actual)

After Project Implementation (Actual)

Appreciation for Dravyavati River Project

Dravyavati River Project Retweeted

Narendra Modi @narendramodi · Oct 6

I congratulate the Rajasthan Government for their efforts towards making a state-of-the-art riverfront on the banks of the Dravyavati River.

Under Vasundhara Ji, Rajasthan has made commendable strides in the tourism sector. @VasundharaBJP

M Venkaiah Naidu @MVenkaiahNaidu · 16m

Arieal survey Darayawati river Compliment @VasundharaBJP 4 rejunavation of 47km long river passing through heart of Jaipur to is past glory

Dravyavati River Project @DravyavatiRiver · Nov 2

#TataProjects wins 'Unique Project of the Year' for #DravyavatiRiver Project at #ConstructionTimesAwards @vaibhavgalriya

Award accepted by (L to R):

Colin Batchelor (Project Director)

Y Vijayakumar (VP Water)

Ramesh Krishna (SBU Head C&E)

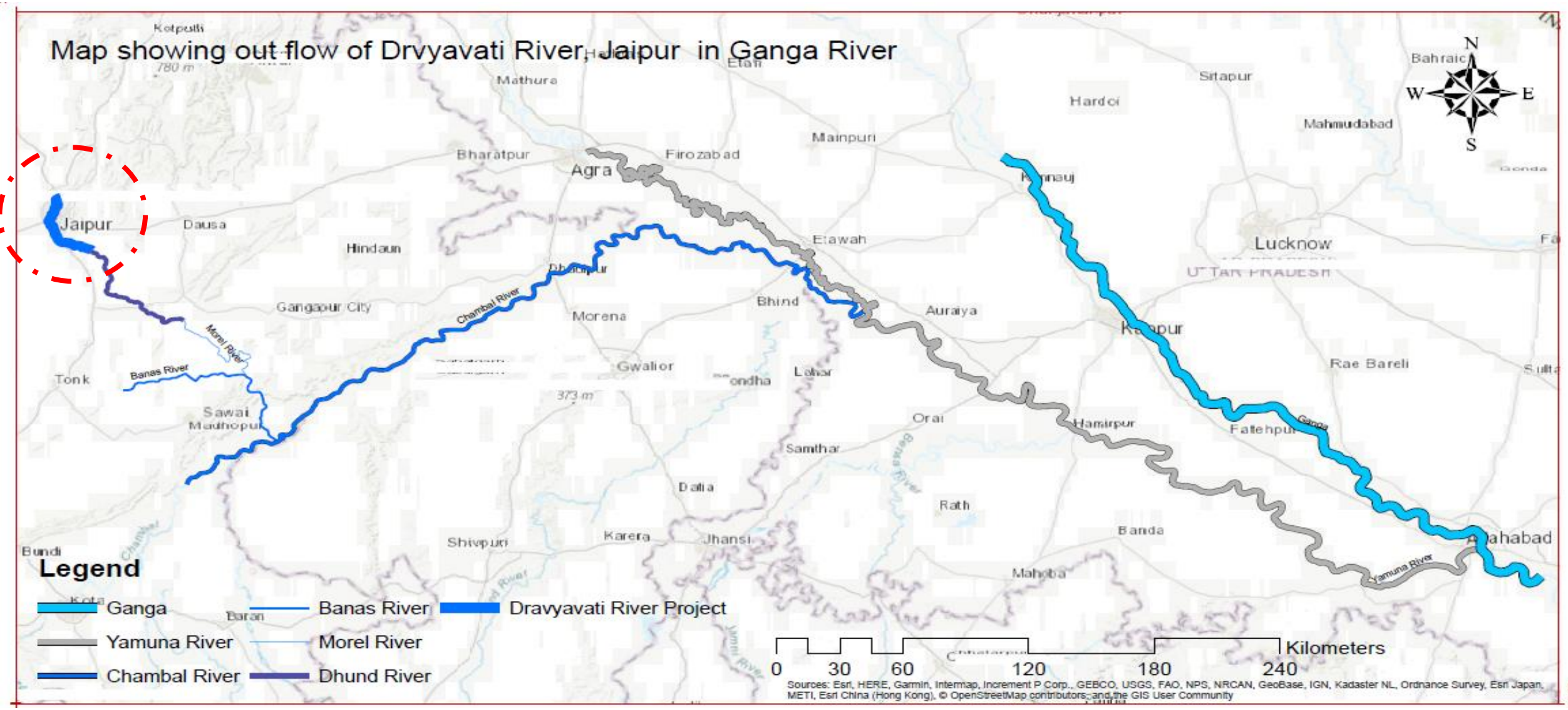
K Satyanarayana (COO-Industrial Systems)

Value Creation

- Health: Will **improve air, water and land quality** of the impact zone resulting increased health capital of the citizen
- Safety: **Flood protection** and general safety will boost confidence of investors
- **Boost economic activities**: better quality land and will bring in more confidence and quality investment
- Employment Generation: Expected to generate more than **5000 jobs** in eco system
- **Reclamation** of valuable **Government land 72 Hectares**
- Value enhancement of the properties in impact zone: **wealth creation for citizens**.
- General **enhancement of economic activities** in the city.

Project Impact

Address cleansing of Tributaries by targeting integrated interventions in major urban areas situated along them.

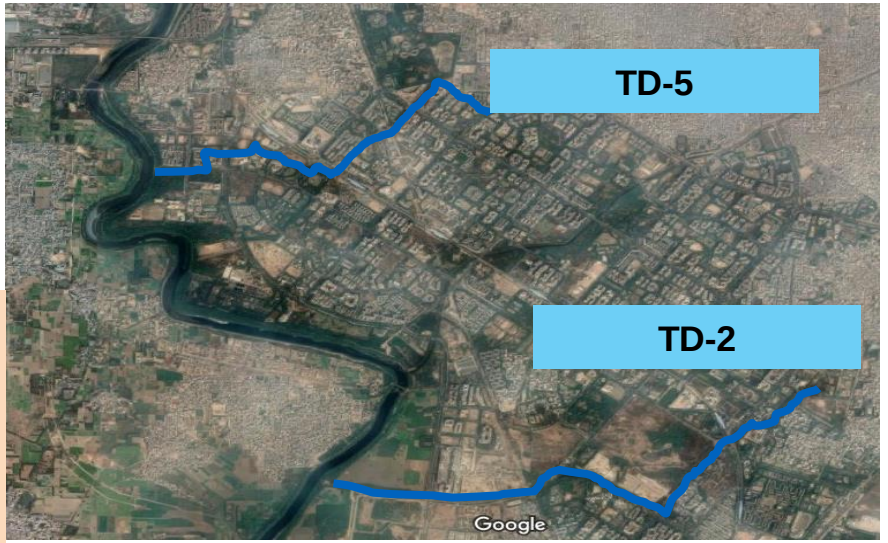


Similar River Rejuvenation Projects Under Planning/DPR Stage

Development of TD2 and TD5 Drains in Dwarka, Delhi

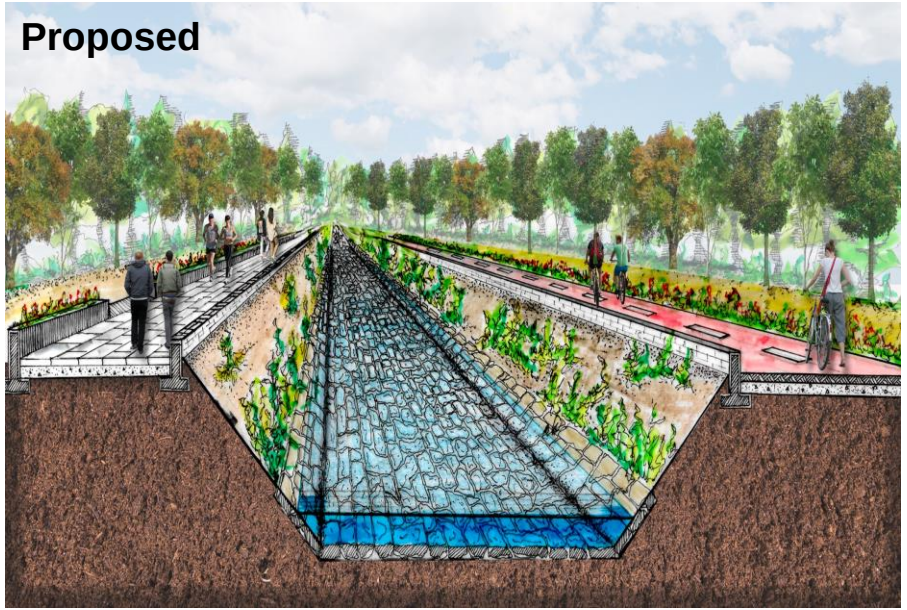
Scope of works to Develop TD2 (5.1 KM) and TD5 (3.8 KM)

- **Hydraulic Improvements** to carry Storm water from Catchment Area
- **Pollution Abatement** by intercepting untreated effluents and its treatment
- **Area Development** with walkways, Cycle track, Sit-outs etc along Developed Drains



Objective to Develop Drains as green corridor

- Walkway & Cycle track to provide connectivity to the metro station
- Street furniture
- Shaded walkways by planting of large evergreen trees
- Water cascades to assist natural water treatment



Hindon River Rejuvenation at Ghaziabad

Scope of works to Rejuvenate Hindon River in Ghaziabad:

- **Hydraulic Improvements** to carry Storm water from Catchment Area
- **Pollution Abatement** by intercepting untreated effluents and its treatment
- **Area Development** with walkways, Cycle track, Sit-outs etc along riverfront

Badi Nadi And Chotti Nadi Rejuvenation Project at Patiala

Scope of works to rejuvenate Badi Nadi (8 KM) and Chotti Nadi (5KM)

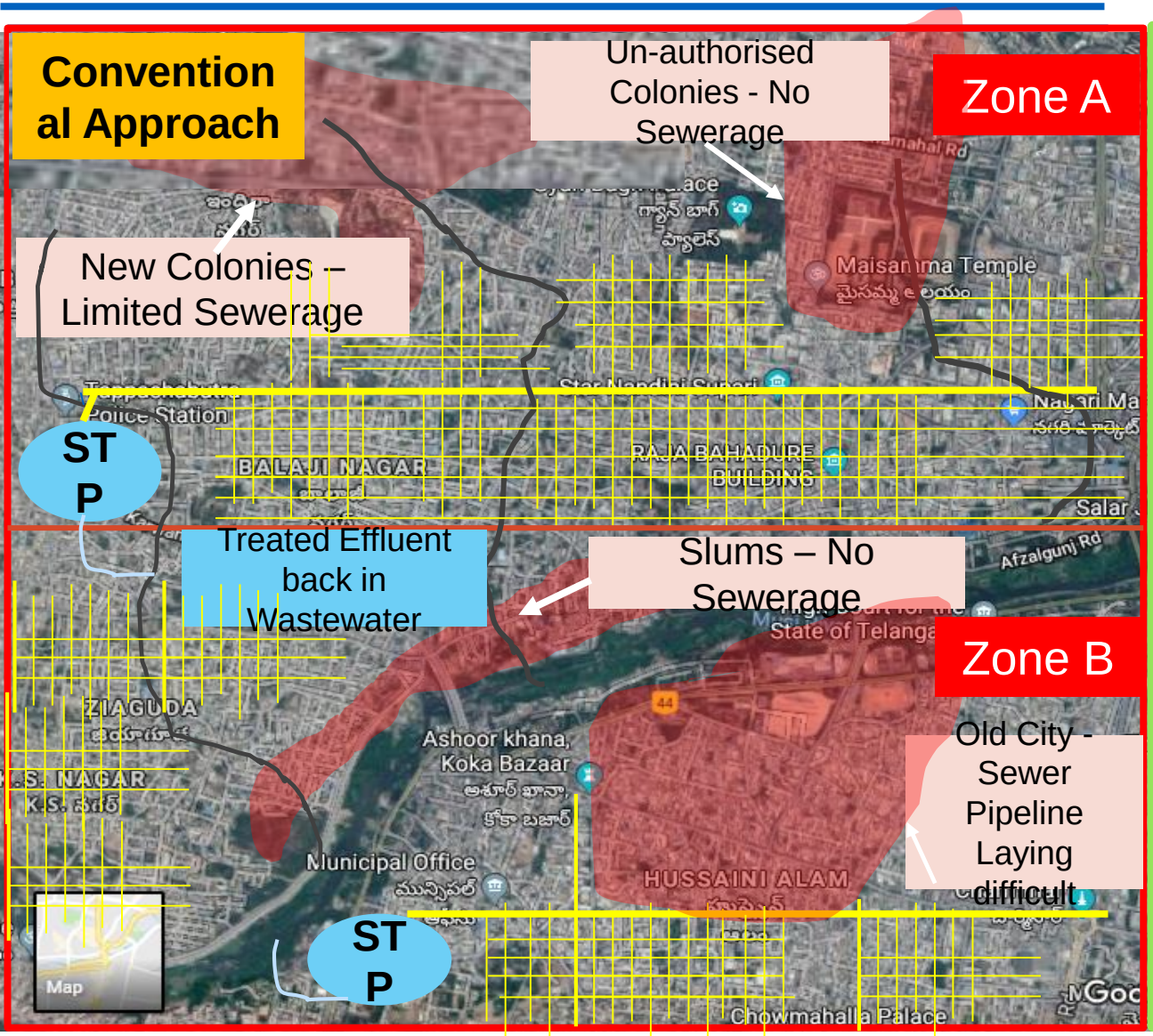
- **Hydraulic Improvements** in to safely pass 50 year return flood discharge
- **Pollution Abatement** by intercepting and treating about 50 MLD Sewage and Industrial Effluent
- **Area Development** with Riverfront on Chotti Nadi and Nodal developments on Badi Nadi

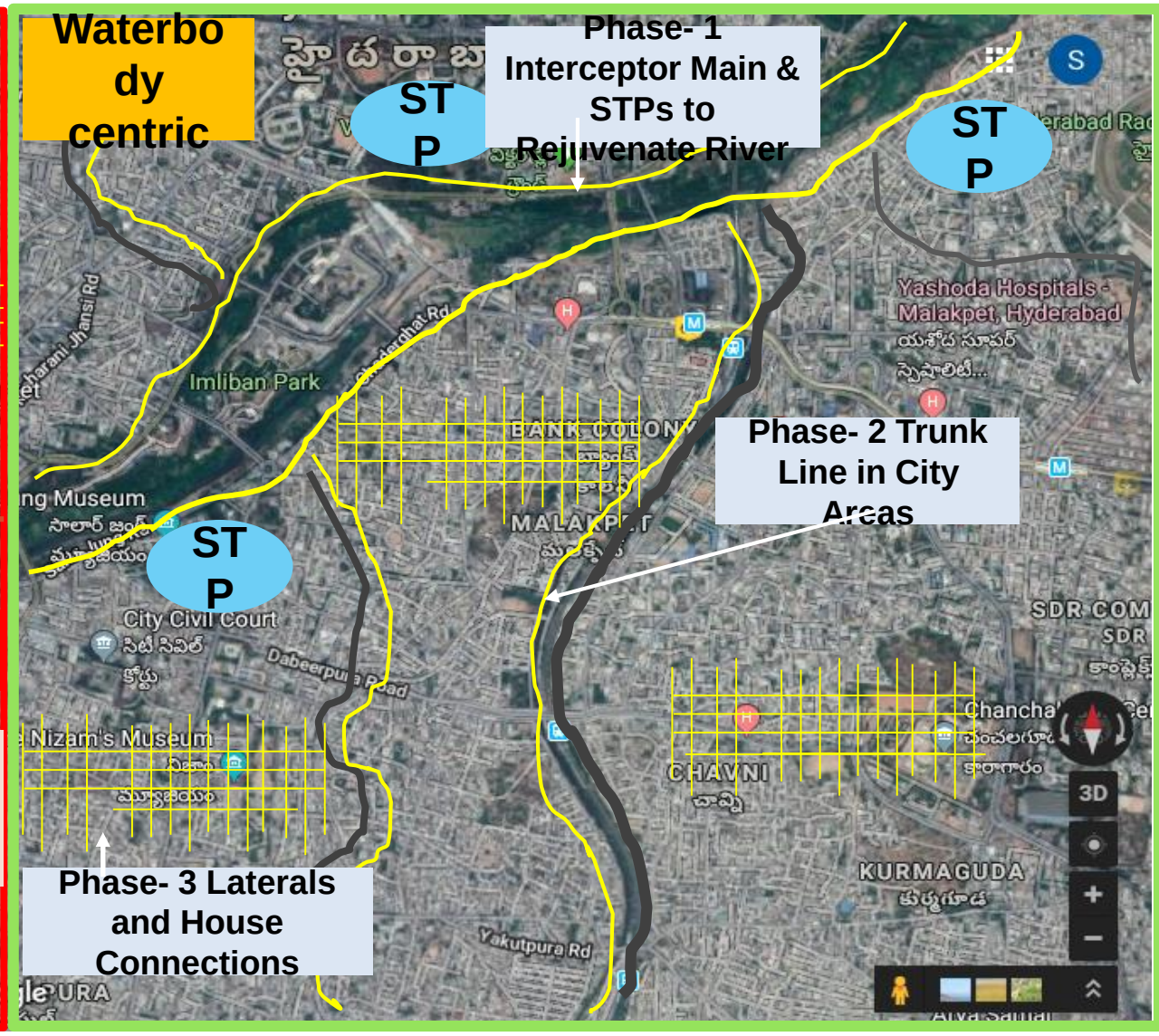
Riverfront on Chotti Nadi, With Cycle Track, Walkway, Promenades, Sitting areas, SMART Poles; BioToilets, Landscaped areas etc

Ground Water Recharge with Soil Aquifer Treatment (ISRAIL Technology)

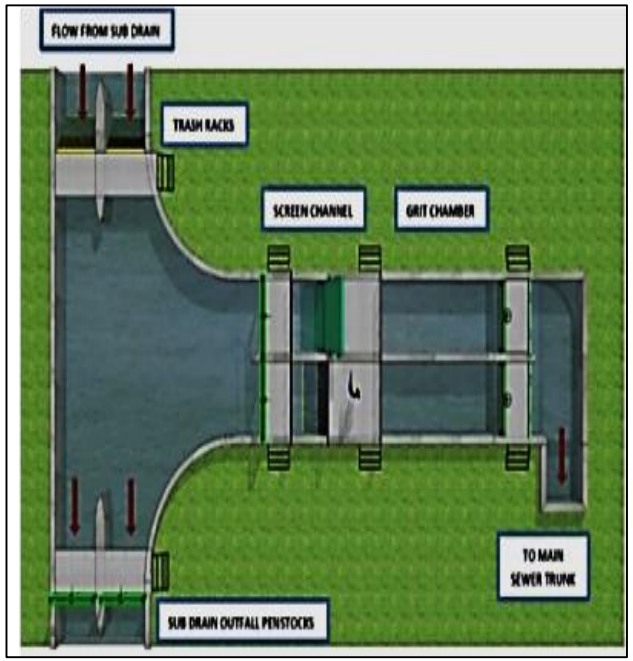
Conventional Household Based Sewerage Design Vs Water Body Based (River Side Model)

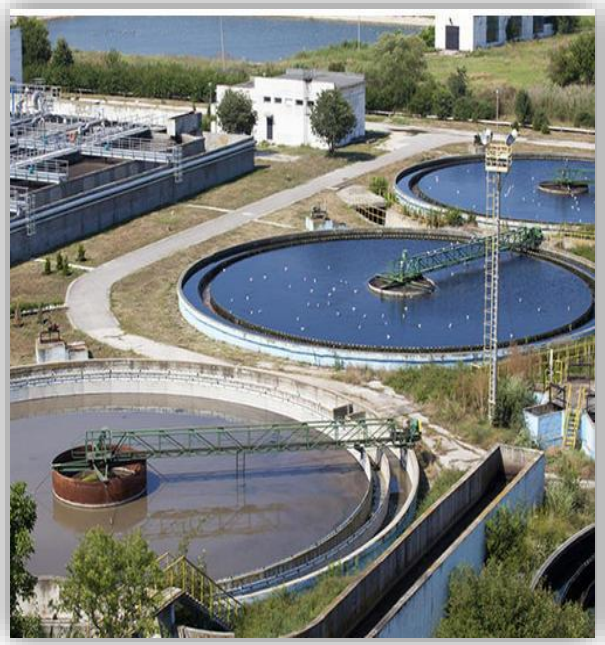
Conventional Household Based Sewerage Design Vs Water Body Based (River Side Model)

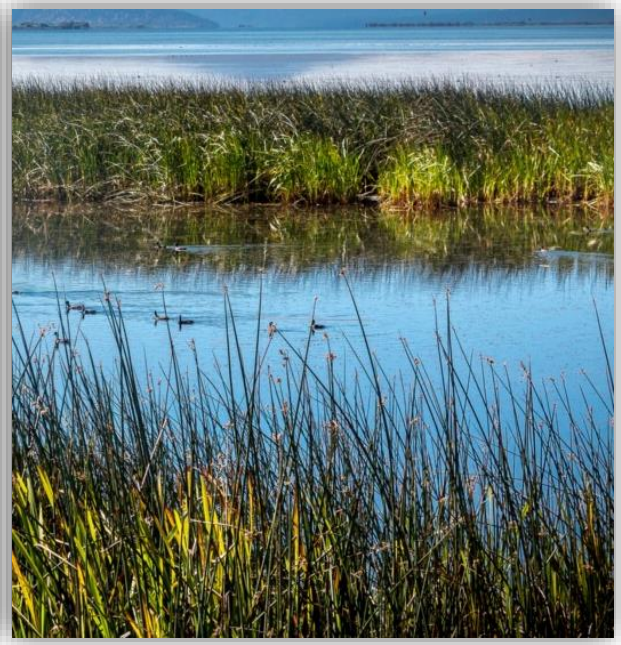




INTEGRATED RIVER REJUVENATION PROJECT OBJECTIVES - I: POLLUTION ABATMENT







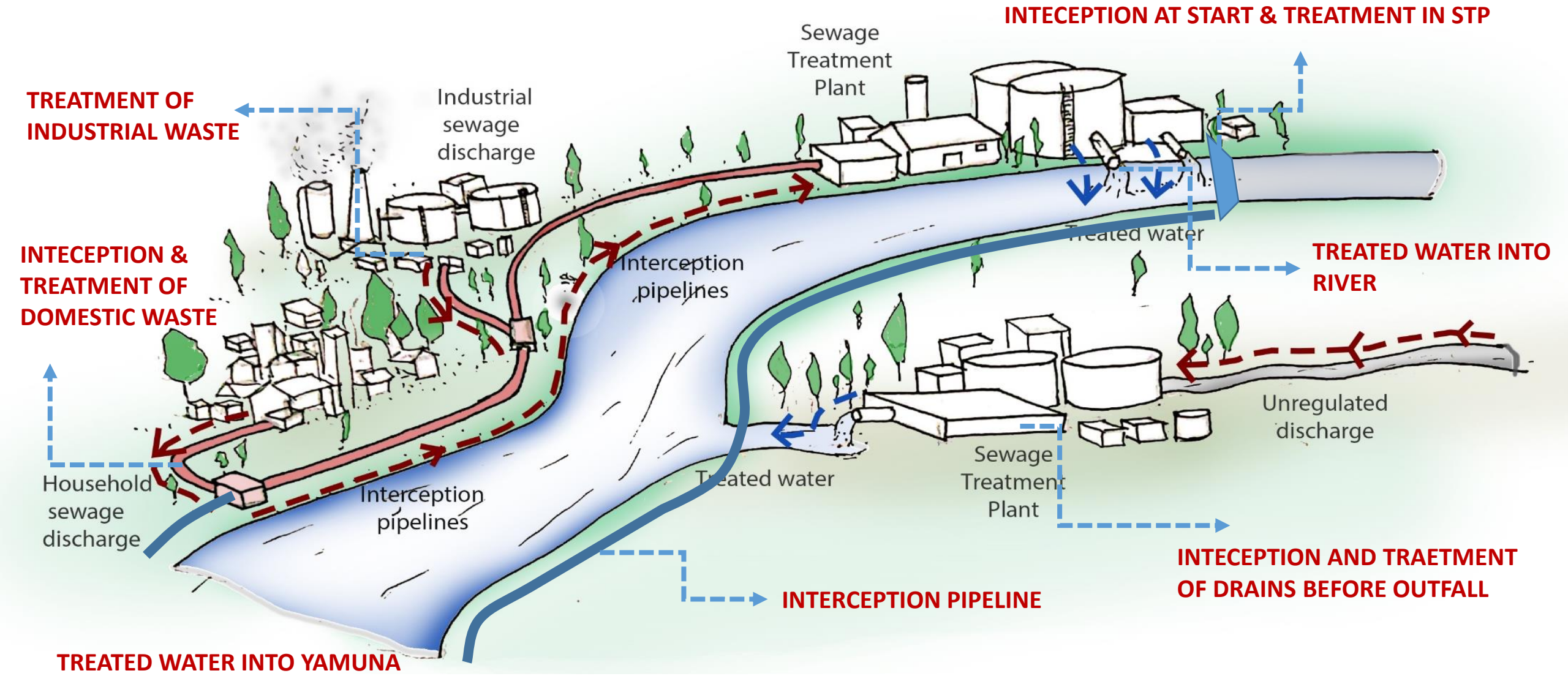
INTERCEPTION & DIVERSION NETWORK

SEWAGE INTERCEPTION AND TREATMENT

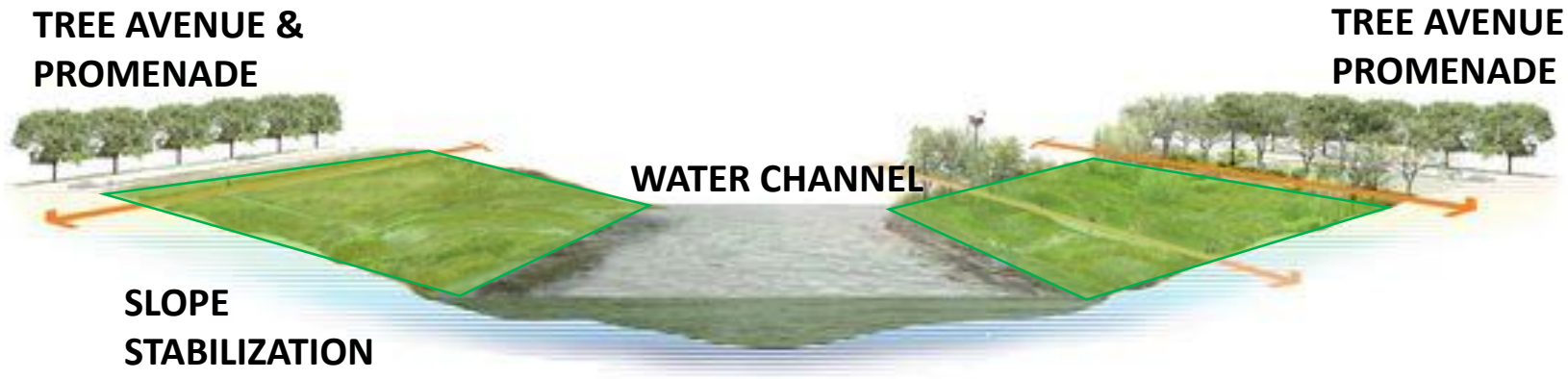
TREATMENT THROUGH AERATION & FLOW

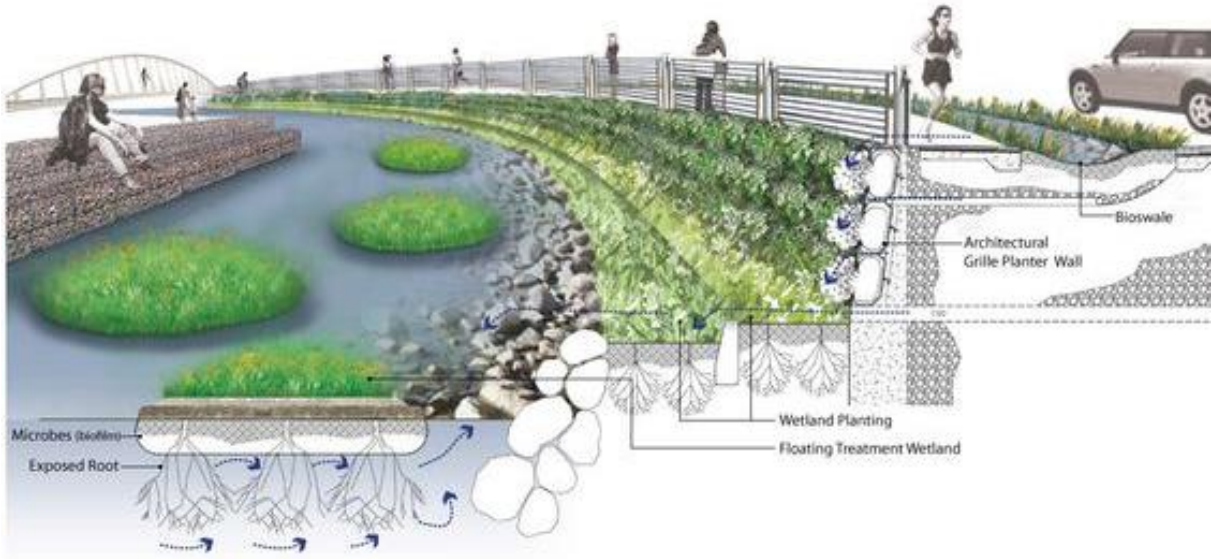
NATURAL TREATMENT

POLLUTION ABATMENT



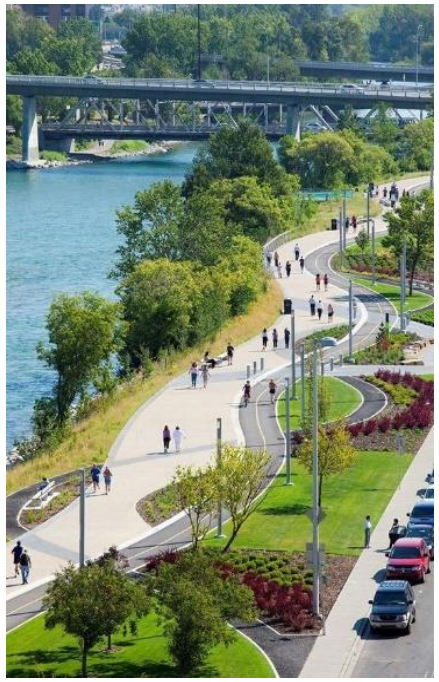
INTEGRATED RIVER REJUVENATION PROJECT OBJECTIVES - II: HYDRAULIC INTERVENTION

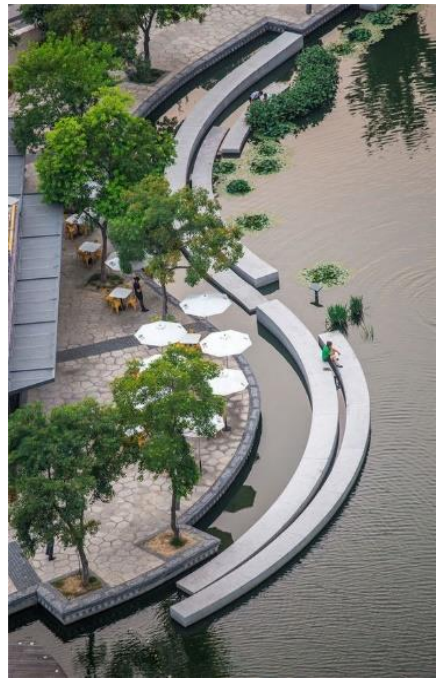




INTEGRATED RIVER REJUVENATION PROJECT OBJECTIVES - III: AREA DEVELOPEMENT

- River promenade
- Walkway & Cycle tracks
- Riverfront Sit-outs / Viewing Decks
- Lighting
- Public Toilets
- WIFI hotspot, mobile charging points,
- CCTV camera & Security Cabins.
- Smart Riverfront access





Sewage Treatment Process and Requirements

Wastewater treatment process : Levels

Treatment level	Description
Preliminary	Removal of wastewater constituents such as rags, sticks, floatables, grit, and grease that may cause maintenance or operational problems with the treatment operations, processes and ancillary systems.
Primary	Removal of a portion of the suspended solids and organic matter from the wastewater.
Advanced Primary	Enhanced removal of suspended solids and organic matter from the wastewater. Typically accomplished by chemical addition or filtration.
Secondary	Removal of biodegradable organic matter (in solution or suspension and suspended solids. Disinfection is also typically included in the definition of conventional secondary treatment.
Secondary with nutrient removal	Removal of biodegrades organics, suspended solids, and nutrient (nitrogen, phosphorus, or both nitrogen and phosphorus)
Tertiary	Removal of residual suspended solids (after secondary treatment) usually by granular medium filtration or micro screens. Disinfection is also typically a part of tertiary treatment. Nutrient removal is often included in this definition.
Advanced	Removal of dissolved and suspended materials remaining after normal biological treatment when required for various water reuse applications.

Polluting Constituents of wastewater and treatment processes

#	Constituent	Unit Operation or Process		
1	Suspended solids	Screening Grit removal Sedimentation	Flotation Chemical precipitation Depth filtration	High-rate clarification Surface filtration
2	Biodegradable organics	Aerobic suspended growth variations Aerobic attached growth variations Anaerobic suspended growth variations	Lagoon variations Physical-chemical systems Chemical oxidation	Anaerobic attached growth variations Advanced oxidation Membrane filtration
3	Nutrient Nitrogen	Chemical oxidation (breakpoint chlorination) Ion exchange	Fixed-film nitrification and denitrification variations Air stripping	Suspended-growth nitrification and denitrification variations
4	Phosphorus	Chemical treatment	Biological phosphorus removal	
5	Nitrogen&phosphorus pathogens	Biological nutrient removal variations Chlorine compounds	Ozone Ultraviolet (UV) radiation	Chlorine dioxide
6	Colloidal and dissolved solids	Membranes Chemical treatment	Carbon adsorption Ion exchange	
7	Volatile organic compounds	Air stripping	Advanced oxidation	Carbon Adsorption
8	Odors	Chemical scrubbers	Biofilters	Compost filters

Typical Treatment Process

Secondary Treatment
- Reaction Tanks (Aeration)
- Clarification
- Chlorination
- Sludge Management (Thickener/ Digester)

Primary Treatment

- Course Screens
- Fine Screens
- Grit Chamber
- Parshal Flume

Tertiary Treatment (For Reuse)
- Filtration
- UF/RO

Policy Perspective : Challenges : Recommendations

OVERVIEW OF RECENT SCHEMES LAUNCHED BY GOI

Namami Ganga Project

- Pollution abatement & Rejuvenation;
- **~$3B** outlay for river cleaning, dev. & sewage treatment infra

(To tackle Water Contamination)

Jal Jeevan Mission

- Access to tap water to ~140M households (55L per person per day) by 2024;
- **~$50B** spend announced

(To tackle Water Scarcity - by providing access)

AMRUT

- Water supply, Sewerage & septage mgt., Drainage, Urban Transport and Parks;
- **~$14B** outlay

(To tackle Water Contamination & improve Water Access)

Pradhan Mantri Krishi Sinchai Yojna (PMKSY)

- Increase cultivable area under irrigation & improve water use efficiency;
- **~$9B** overall spend

(To improve Water Access & encourage Efficient usage)

MoEF

- Abatement of River pollution;
- Treated water for industries

(To tackle Water Contamination)

Smart Cities Mission

- **~$7B** outlay for Smart Water mgt. (Distribution utilities, Smart Meters etc.)

For Efficient usage)

Draft National Water Framework Bill 2016 (planned)

- Water pricing & sectoral usage, pvt. participation, water treatment & river rejuvenation

OBJECTIVES OF CENTRAL GOVT. POLICIES FOR WASTEWATER INFRA.

1. NATIONAL URBAN SANITATION POLICY (NUSP)

"Objective: To provide universal cover with 100% water supply through piped water and 100% waste water collection through sewerage network and treatment"

2. ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION (AMRUT)

- Ensure that every household has access to a tap with assured supply of water and a sewerage connection;
- Increase the amenity value of cities by developing greenery and well maintained open spaces (e.g. parks);
- Reduce pollution by switching to public transport or constructing facilities for non-motorized transport (e.g. walking and cycling)."

CHALLENGE – I: POLICY FRAMEWORK & GAPS

500 Cities and Towns with population of over 1 lac with notified Municipalities selected.

Service Level Improvement Plan (SLIP) - To assess service level gaps. Urban Local Body (ULB) develops plan to correct gaps.

State Annual Action Plan (SAAP)- States decide on inter-ULB allocation based on gap analysis and financial strength of ULBs.

ULBs Prepare projects for infrastructure in centralized or decentralized manner

Gaps	Outcomes due to Shortfalls
Household data taken from Census (2011), (significant chances of error during designing & costing)	1. 100% Coverage becomes distant reality and we continue to contaminate Water Bodies (Lakes, Rivers) 2. Resultant Ground Water pollution 3. Loss of valuable land along river banks 4. Spoiled city aesthetics
No account of development of unauthorized colonies mostly on river banks (these continue to pollute water bodies)	
Lack of focus on conserving / protecting Urban Water Bodies	
Delay in Project Planning and Execution (Pipeline & STPs) by ULBs (project objective to save water bodies gets compromised)	
Lack of focus on Water Front development to create tourist infrastructure and improve city aesthetics	

Challenge II : Bidding process to procure on Process based Approach

- **Presently bids evaluated on Lowest Cost model** - limited consideration of Technical Proposals to understand the complex nature of Wastewater and suitable treatment to ensure required outlet parameters.

- In STP projects, **there is a need to carry out comprehensive Testing of Wastewater samples**, to ascertain right treatment process. Standard parameters / parameters mentioned in tender or DPR assumed. Variation in influent waste water quality affects the treatment process

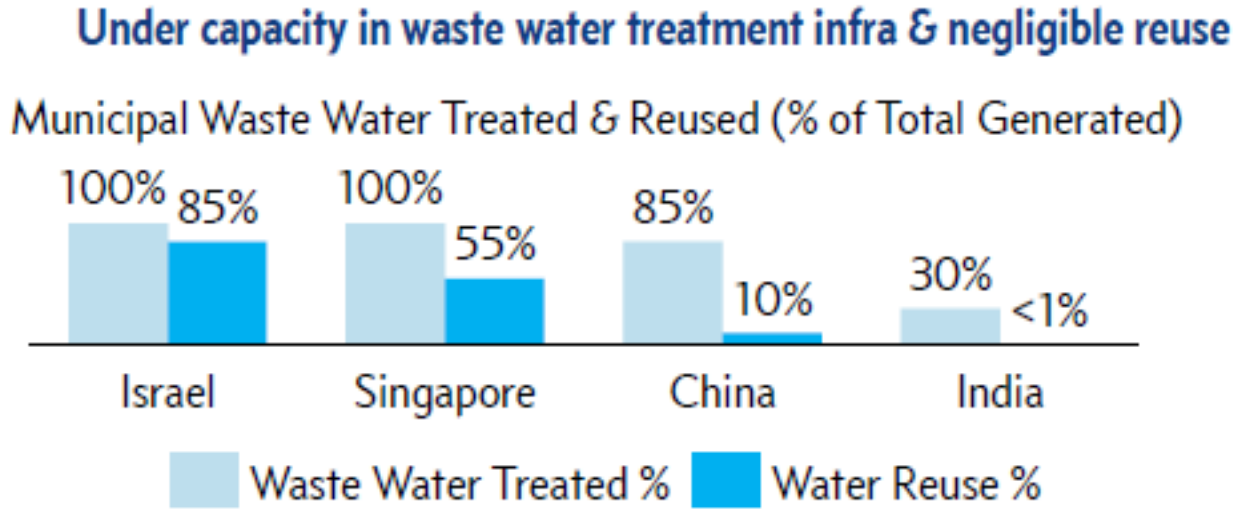
- Several plants defunct on account of variation in influent parameters (BOD, COD, TSS, Color etc.) and Capital infused to create this infrastructure is wasted.

Outlet water being discharged from STP into River

CHALLENGE III : LIMITED GUIDELINES TO PROMOTE WATER REUSE

- Limited guidelines across most States on treated water reuse for applications like Landscaping, Construction, non-potable water

- Legacy water supply infrastructure doesn't support water reuse, as it requires dual plumbing system



Key positives:

- Gujarat issued policy for reuse of Treated water

- Several Power plants have started using recycled water for cooling tower requirements

- Chennai and Vizag have set up plant to supply treated water to Industries / non-potable use

Recommendations

Integrated Water Body Rejuvenation Projects	• The central/State waste water policies must have clear funding program for integrated river rehabilitation/rejuvenation in the city (for top 25 cities of the country)
Procurement system	• Selection System which provides due consideration to Process Design of STPs, based on inlet and outlet parameters.
Water Reuse Policy	• Robust Policy for States/ULBs to increase water reuse for non potable purposes, thereby reducing load on fresh water requirements
City Mission Clean River	• Identify top 25 cities and create a city level body on the lines of National Mission Clean Ganga (NMCG) to take care of the river in the city

Thank You!