Enhance Water Resilience through Integrated Water Management

WCS Smart Cities Workshop
Surat Municipal Corporation, India

A Temasek Foundation Urban Resilience Project brought to you by:
Surat also known as...

- **Diamond City**: 9/10 Diamonds in the world are cut and polished in Surat.
- **Textile City**: 40% of nations total man-made fabric & 28% of nation's total man-made fiber production.
- **Bridge City**: Over 115 bridges to ease commute.
- **Solar City**: Declared as Solar City by Ministry of New & Renewable Energy.
- **Green City**: Over 200 public parks & gardens along with Nature Park & upcoming Biodiversity Park.
**Surat**

*One of the Best Cities*

- **Best Performing City**
- **2nd Cleanest City**
- **2nd Best City**
- **5th Best City**

**Data Maturity Assessment**
- Framework Cycle 2
- Among 100 Smart Cities

**Climate Smart Cities**
- Assessment Framework 2.0
- Among 126 Cities

**MPI 2020**
- 2nd Best City of India as per Municipal Performance Index parameters

**EoL 2020**
- 5th best city of India based on EoL which evaluates the quality of life

**Surat**

One of the Best Cities

- Declared 2nd Cleanest City of India in the World’s largest cleanliness survey of 4242 cities
- Consecutive third year for great showing in momentum of implementation Projects under Smart City Mission
- Among 126 Cities
- Among 100 Smart Cities

**GARbage FREE CITY**

One of six 5-Star Garbage Free Cities
Surat

Tapi River Vision

Surat has envisioned working on the Tapi River, since the release of its City Resilience Strategy in 2017.

Surat is successfully implementing the Tapi River clean-up plan and now ventures toward enhancing the city’s water resilience through critical water infrastructure projects.

“The Story of Surat is The Story of River Tapi...”
Existing weir

Proposed barrage

River bridge

ArcelorMittal Nippon Steel India Ltd.

Transmission line 1800 mm dia. & 18 km length

Existing 37.5 MLD ASARMA STP
Proposed 200 MLD net output TTP

Proposed 170 LL tertiary treated wastewater sump & pump house

Proposed 208 LL secondary treated wastewater collection sump & pump house

Proposed 200 MLD net output TTP

Existing weir
Secure long-term water supply demand of Surat City and surrounding area and conserve excess water flowing away from Weir-cum-Causeway.

Prevent tidal siting and pollution in Tapi river—downstream of Weir-cum-Causeway, as well as salinity ingress in the riverbed to allow recharge of ground water upstream of the reservoir.

Improve ground water quality & reduce risk of erosion and flooding in flood prone neighborhoods.

Establish new road corridor across the river to improve traffic solutions and urban mobility between Dumas road and Ichhapore.

Develop recreation opportunities incl. water sports like, boating, swimming, cruise, para sailing, amusement park and recreational spots etc. and riverfront like stepped garden, river drive road, cycle/jogging/walking tracks to improve environment and aesthetic beauty of the city.

Facilitate recycling of treated wastewater — an environmentally sound and progressive advanced practice.

Increase revenue generation for Surat Municipal Corporation.

Reduce dependency on conventional natural resources for non-potable water usage.

Reduce pollution load at the receiving estuary/river bodies and high stress on existing water resources.
Project Context: Conventional Barrage

Project Overview
- Create freshwater reservoir incl. 10 km long reservoir and 525 hectare surface area with catchment area of 1,840 Sq.km and 19,172 MCM freshwater storage.
- Project cost Rs. 825 Cr. including preliminary survey and construction work.
- Develop concrete barrage body wall with diaphragm wall / retaining wall on both banks, upstream/downstream side apron with abutment, and bridge to connect both bank of River Tapi at Rundh-Bhatha.

Broad Objective
- Secure long term water demand of Surat city.
- Prevent salinity ingress in the riverbed and prevent tidal silting.
- Improve groundwater quality and recharge groundwater.
- Mitigate flooding & rejuvenate river.
- Develop new road corridor across the river to improve traffic solutions and urban mobility between Dumas road and Ichhapore.
- Develop water sports like boating, swimming, cruise, para sailing, amusement park and recreational spots etc.
Design intention

Water Supply
Basin turned into freshwater reservoir through natural flushing
Reduce high stress exhibited on the existing water resources i.e. increase local existing water supply

Tide Control
Keep out sea water and act as a tidal barrier to storm surges and high tide.
Sweet water will be not effected by the tidal water and reservoir level will be constant all the year.

Lifestyle Attraction in Surat city
Ideal venue for various recreational land and water activity support river sports
Venue for many international and local sport events and activities
Fountain water signifies health and wealth.

Improvement of groundwater quality
Salinity control in upstream of the barrage area and recharge ground water, recharge borewell/tube well with sweet water

Flooding
Help to alleviate flooding in the low laying area (right bank) of the city i.e. Pal-Bhatha-Adajan & (left bank) of the city i.e. Umra- Rundh-Magdalla
## Roadmap for implementation

<table>
<thead>
<tr>
<th>Tendered Amount</th>
<th>Rs. 825.91Cr. (USD 104,594,432.54)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Including preliminary work &amp; barrage construction work.</td>
</tr>
</tbody>
</table>

### Project Execution Schedule

Completion of preliminary work up to Dec-22 & involve various activities like various studies/reports related to barrage project, model study and project design etc. and tentative completion of barrage project up to Dec-2025.

### Model Study Experts

**Mathematical and Physical Model Studies:**
- Gujarat Engineering Research Institute (GERI),
- Vadodara Central Water Power Research Station (CWPRS), Pune

### Technical Experts

**Tendering Work/Design:**
- Sardar Vallabhbhai National Institute of Technology, Surat.
- Water and Power Consultancy Services (Wapcos) Limited, New Delhi.

### Current Status

- **Environmental Clearance:** Approval granted on 14th March 2022 from the Expert Appraisal Committee for River Valley and Hydrological Projects of Ministry of Environment Forest and Climate Change (MoEFCC)
- **Gujarat Engineering Research Institute:** 2-Dimensional Physical Model Study completed.
- **Central Water Power Research Station, Pune:** Sedimentation and Siltation Study Completed. Topographic Survey Work Completed. Soil Investigation Study Completed.
Overview

- Supply 200 MLD tertiary treated wastewater as Industrial Grade Water to Hazira Notified Industrial Region.
- The treated wastewater generated at Existing Bhesan STP, Variav-Kosad STP and Asarma STP will be supplied to meet the industrial water demand of Hazira Industries.

Proposed Project Component

- New 208 Lakh Liter capacity sump for collection of 340 MLD secondary treated wastewater proposed at Asarma.
- New 200 MLD (Net Output) TTP proposed at Asarma to treat secondary treated wastewater up to tertiary level.
- New 170 Lakh Liter Treated Wastewater Sump proposed at Asarma to collect tertiary treated wastewater.
- Transmission line of 1800 mm Dia. & length 18000 Rmt from Asarma STP up to pre-identified point at the Hazira Industrial Region.
Rationale For Selecting the Priority Project

- Water resources are getting depleted due to increasing industrialization, population growth, exploitation of groundwater & rivers, increasing demand for domestic purposes etc.
- Preserve potable water resources for drinking purposes instead of being used for non-potable purposes.
- Reduce dependency on conventional natural resources for non-potable usage.
- Currently, huge quantity of treated sewage is available with Surat Municipal Corporation. The treated sewage has high potential to be reused for multiple purposes.
- It is very important to increase reuse of sewage generated, to reduce potable water demand or optimize against development and growth.
- Increase revenue generation from reused treated wastewater.
- The proposed TTP will generate 200 MLD treated wastewater for industrial non-portable use, thereby saving 200 MLD of fresh water, which can meet the daily water demand of approximately 13.30 Lacs population.
Thank You

This project pitching is made possible with the support from Temasek Foundation