



PIONEERED BY THE
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100

RESILIENT

CITIES



Surat City Profile

- Surat situated on western coast of India 21.17°N , 72.83°E
- Area of city: 326 sq.km, population : 5.5 million
- Average Annual rain fall in Surat : 50 to 55 inch
- Length of river Tapi passing through Surat City : 31.69 km
- ACCCRN
- Smart City Initiatives of Gol
- 100RC – RF Initiatives



8th Largest
Indian City



4th fastest
growing
Global City



Economic
Capital of
Gujarat



90%
Diamonds in man-made
world are cut fabric , per day
and polished 40 million mts



India's 60%

“Asia Urban resilience Finance Forum”
‘Tapi River Cleaning-Up Project’
May 24-25, 2017, Bangkok

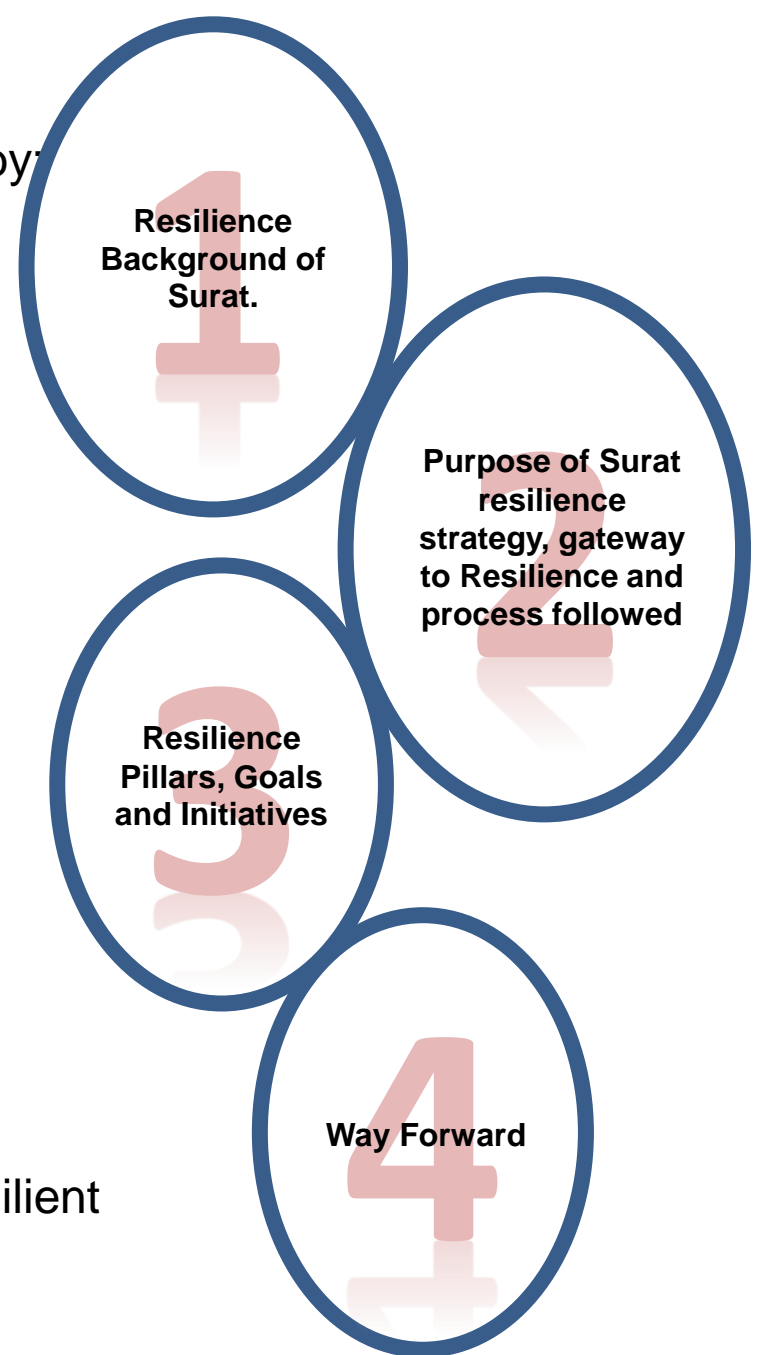


Shocks & Stresses : People are drawn to Surat as centre of economic activity, social connection, opportunity and innovation.








Surat Resilience Strategy:

A tactical roadmap to build resilience in the city by:

- Identifying resilience priorities of city
- Recognizing realistic initiatives
- Engaging stakeholders
- Enhancing capacity by shared learnings
- Guiding the city's development
- Engaging with the 100RC network
- Providing opportunities to share experiences
- Providing an overarching framework
- Developing a clear vision and mission for Resilient City.



Resilient Surat : 21 Goals....65 Initiatives

Areas	Research	Awareness	Enforcement	Implementation	Monitors & Incubators
	Improve mobility and connectivity through research	Road safety awareness by education & training	Law enforcement for traffic management	Ensure safer road infrastructure	Traffic Cell CEPT, SVNIT
	Spatial assessment of demand & supply of affordable housing	Awareness to improve outlook and maintenance of affordable housing		Engineering & technological intervention for affordable housing	TP & Slum SVNIT
	Qualitative & quantitative research monitoring for city water resources	Awareness generation & water education to citizens	Pollution control guidelines at community & industrial levels. Water quality standard	Innovative intervention for water supply & quality	Hydraulic VNNGU, SCET
	Diversified business sector & opportunities	Skill development through training & capacity building			UCD SGCCI, VNNGU
	Research on Urban Climate Change Resilience	Citizen awareness about urban eco-system	Regulation and enforcement for environment laws	Innovative urbanism tactics for balanced eco-system	Environment TIFAC
	Research on local & regional social cohesion	Social cohesion through awareness generation			Cultural CSS, SCOPA
	Research on healthier citizens in healthy city	Public health awareness			Health UHCRC

LC3 : Identified Mutual Priority Projects to be discussed at the GRA

- **Pillar 1 - Connectivity & Mobility Services & Regulation**
 - Goal 1.1: Improve mobility & connectivity through research
 - 1.1.1 Spatial assessment of accessibility to public transport (**WRI**)
 - Goal 1.4: Ensure safer road infrastructure
 - 1.4.1 Non-motorized transport strategy
- **Pillar 2 – Affordable Housing**
 - Goal 2.1 – Spatial Assessment of Demand & Supply of Affordable Housing
 - 2.1.2. Affordable locality audit (**PWC**)
 - Goal 2.2: Awareness to Improve outlook and maintenance of Affordable Housing
 - 2.2.2 Affordable housing finance schemes
- **Pillar 3 - Water Availability & Quality**
 - Goal 3.1: Qualitative & quantitative research & monitoring for city water resources
 - 3.1.2 Real-time river health monitoring of Tapi River (**Veolia**)
 - Goal 3.3: Pollution Control Guidelines for water quality standards at community & Industrial levels
 - 3.3.1 Preservation of river and tidal creeks (**Arcadis & Deltares**)
 - Goal 3.4: Innovative engineering & technology intervention for water supply and quality
 - 3.4.1 Advanced smart water supply system (**Deltares**)
- **Pillar 4 - Dominant Sector of Employment & Economic Dependency**
 - Goal 4.1: Diversified business sectors & opportunities
 - 4.1.3 Promote women entrepreneurs (**EY**)
- **Pillar 5 – Eco-System & Environmental Regulation**
 - Goal 5.4: Innovative Urbanism Statics for Balanced Ecosystem
 - 5.4.1 Community Level Rain Water Harvesting System (**TNC; Tactical Resilience Workshop**)
- **Pillar 6 – Social Cohesion**
 - Goal 6.2: Social Cohesion through awareness generation
 - 6.2.1 Centre for community resilience (**RBD; Citymart Challenge**)
- **Pillar 7 - Upscaling of Health**
 - Goal 7.1: Research on healthier citizens in healthier cities
 - 7.1.1 Center of excellence for urban health and climate resilience (**Save the Children**)

Other Projects Discussed

1. Real Time Water Quality Monitoring : Surface Water Quality Monitoring of River Tapti (Home-land water security based - Water Contamination Information Tool WCIT)
1. Water supply, assessment : Water Availability for sustaining existing water supply and future water supply project
2. Review of Existing Water Treatment Process : Potential for Advancement with UF+ACF process
3. Resilient measure through raw water transmission : Cater the future water demand (600 MLD capacity Intake well at Gaypagla, 32 Km length Transmission Line, 200 MLD capacity WTP at Bhesan etc.)
4. Construction of French wells : To meet the life line water demand (Once study of aquifer mapping is done through National Geo-physical Research Institute, Department of Science and Technology, Government of India)
5. Review of requirement related to Disaster Management : Consideration of available resources in the city, mainly include, with SMC and Hazira, to face Flood, Fire and Emergency etc. and bridging the deficiency
6. Tapi Cleaning Master Plan : To review the master plan to clean-up Tapi river from Kakrapar Barrage to ONGC Bridge

Clean The River Tapi



Tapi is only source of fresh drinking water to entire Surat city.

The purpose is to clean River, by treating sewage at it source and by stopping the same at outlets.

- River Length 724 Km before falling in the Arabian Ocean
- Reservoir Type Earthen & masonry dam
- Distance from Surat 90 Km (Upstream of Surat)
- Total Catchment 65,145 Sq. km
- Command Area 411,000 Ha. with Sugarcane crop in majority

Present Vulnerabilities

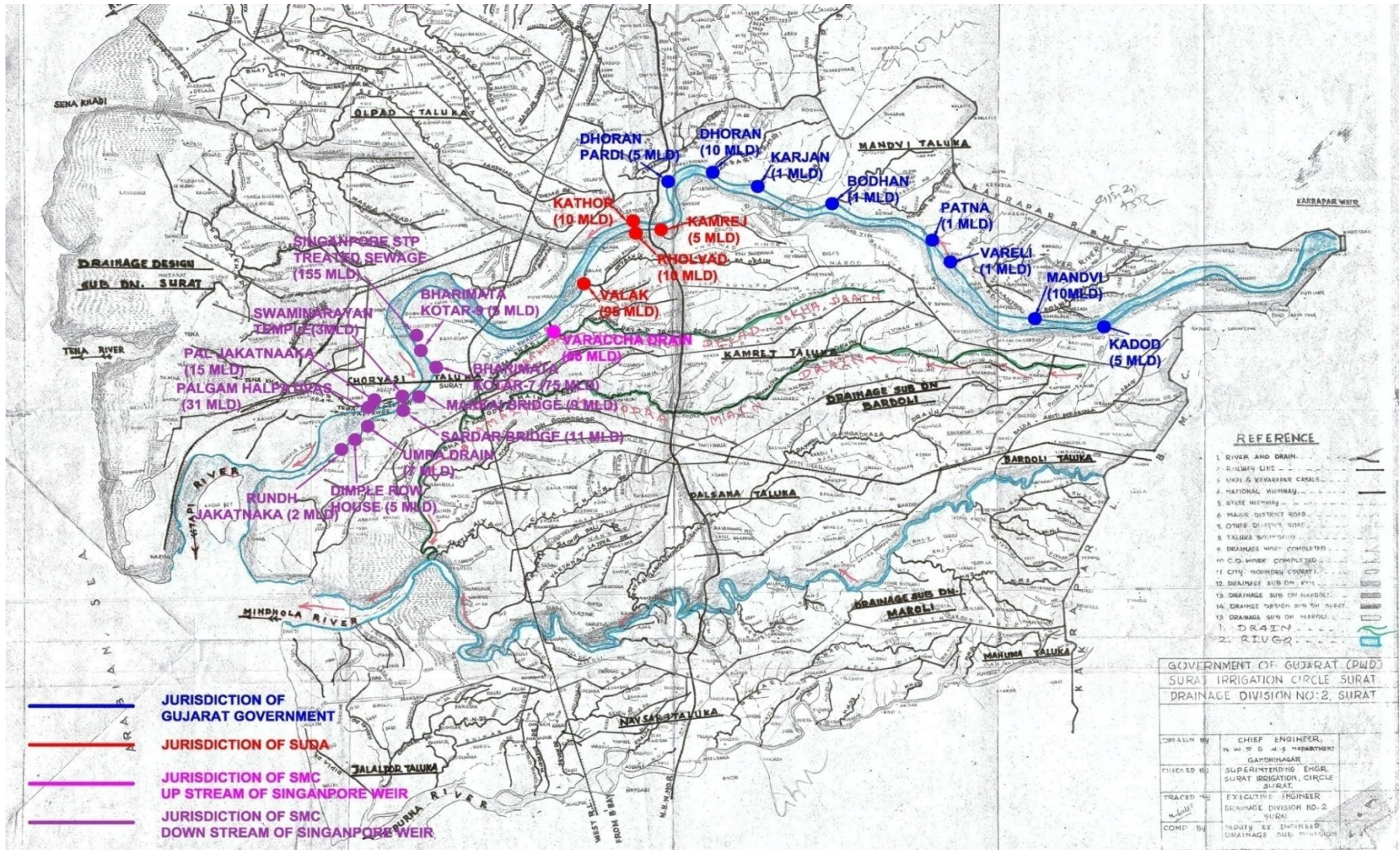
- Water Security
- Economic/
Livelihood
- Public Health
- River Ecology

Technical Assistance

- Water Monitoring
- Governance Coordination
- Feasibility Study

Project

- Collection/Treatment in SMC
- Collection/Treatment in SUDA
- Collection/Treatment in Statte



Drainage Outlets in the River Tapi

No.	Location	Flow, MLD (Avg. Flow)	No.	Location	Flow, MLD (Avg. Flow)
L1	Kadod	5	R1	Kamlapor - Mandvi	10
L2	Kamrej	5	R2	Vareli	1
L3	Kholwad	10	R3	Patna	1
L4	Valak	95	R4	Bodhan	1
L5	Varachha drain	66	R5	Karjan	1
L6	Nr. Bhari mata Kotar 9	5	R6	Dhoran	10
L7	Singanpore STP Treated Sewage	155	R7	Dhoran Pardi	5
L8	Nr. Bhari mata Kotar 7	75	R8	Kathor	10
L9	Makkai Bridge	9	R9	Swaminarayan Temple- Adajan	3
L10	Sardar Bridge- Athwa Gate	11	R10	Nr. Pal Jakat Naka	15
L11	Umra drain	7	R11	Batha Nr. Palgam Halpatiwas	31
L12	Nr. Dimple Row House	5			
L13	Rundh Jakat Naka	2			

Total flow from various drainage outlet from Kakrapar to ONGC bridge : > 500 MLD

Block Cost Estimates – Summary

No.	Location	Flow, MLD (Avg. Flow)	Estimate (Rs. Crore)
(A) From Kakrapar to NH – 8 (SUDA Boundary)			
1	Left Bank	5	30.00
2	Right Bank	29	86.00
	Total (A)	34	116.00
(B) Within SUDA area			
1	Left Bank	110	221.00
2	Right Bank	10	42.00
	Total (B)	120	263.00
(C) Within SMC area			
1	Left Bank	335	395.00
2	Right Bank	49	98.00
	Total (C)	384	493.00
	Total (A) + (B) + (C)	538	872.00
	2% Administrative Charges		17.44
	5% Contingency Charges		43.60
	1 % Labour Cess		8.72
	Grand Total		941.76

Summary of Benefits

- Success of Tapi River cleaning can be achieved when upstream areas (14 villages) beyond SUDA limits are covered by underground drainage network and 100 % drainage coverage is achieved within SMC and SUDA boundaries.
- Clean drinking water for 5.5 Million population of Surat city and urban agglomeration,
- Clean river will attract more recreational activities,
- Clean eco-systems and social life in buffer areas of river will highly improved
- River accessibility

Engagement Approach

- Urban Development and Urban Housing (Govt. of Gujarat)
- Special Purpose Vehicle (SPV) / Surat Municipal Corporation
- Surat Urban Development Authority
- Irrigation Department (Govt. of Gujarat)
- District Collector, Surat and District Collector, Tapi District
- Central Water Commission (Govt. of India)

Critical Path Issues

- Funding available from state and central government funding's,
- Inter-agency coordination,
- Governance issues,
- Umbrella authority to run the project
- Innovation in technology for future benefits

Next Actions

Immediate

- Need approval from Government of Gujarat,
- Need funding approval,
- Meetings with stakeholders (SMC, SUDA, DC Offices, CWC, UD&HD) after approval
- Identification of priority locations for physical work
- Water quality testing (for all parameters) at all locations/outlets,

Medium-term

- Preparation and publication of tender for physical work
- Start physical work at priority locations,
- Establish monitoring mechanisms,
- Development of O&M strategies,
- Strategies for awareness generation
- SPV formation and mandate for SPV
- User charges reforms

Long-term, Visionary

- Operation and Maintenance
- Tapi Vision 2030

Thank You

A city is only as strong as its weakest link.

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