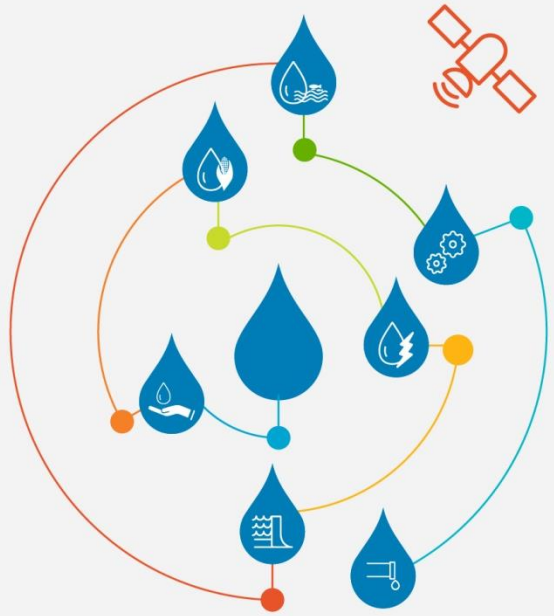
Jaipur (Rajastan): Water Scarcity and the Role of STPs in Minimizing Groundwater Contamination



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03/10/2018

India: Urban Sewage Scenario

Estimated Sewage in India: 62,000 MLD

Treatment Capacity only 37%: 23,277 MLD

Rest: randomly dumped in rivers, seas, lakes and wells, polluting three-fourths of the country's water bodies.

63% of sewage generated in urban India not treated

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Rajasthan Water Scenario

- Driest state, avg rainfall 570 mm (National Avg: 1170 mm)
- 207 blocks in dark zones out of 237 (CGWB)
- Drought like situation in 26 out of 33 districts
- Annual water table loss: 1 to 3 meters
- Around 90% drinking water met by groundwater
- Water supply: once in 24 hrs: 161 towns, once in 48 hrs: 49 towns, once in 72 hrs: in 12 towns, demand-supply deficit 10 BCM

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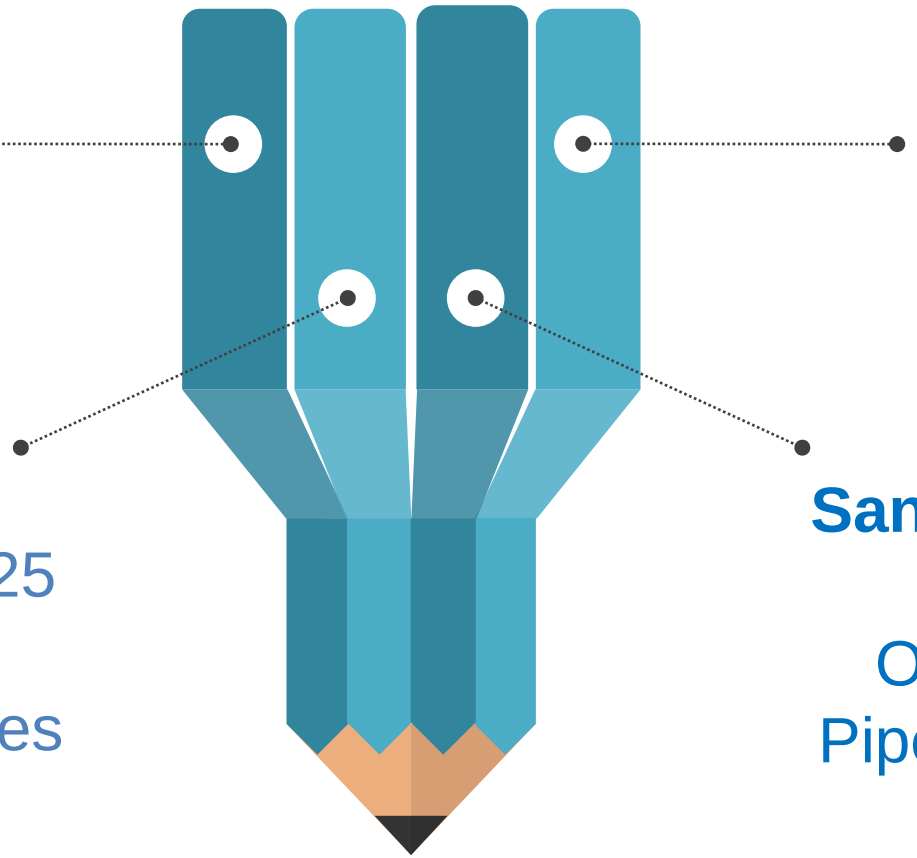
Jaipur

10th Megacity ,Capital of Rajasthan State
Annual growth rate 5% (2001 and 2011),
Population 3.1 million.
Floating Population:10 %



Economy: Trading, administration, tourism a, & local handicrafts industries

Water scarce City,
Groundwater depleted:25 metres
All 13 blocks : Dark zones

Sanitation Coverage: 2011 census
Open Defecation: 39 %
Piped Sewer System: 36 %
Septic tanks: 18 %

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Urban Sewage Scenario: Jaipur

- Total wastewater generation approx. : 378 MLD.
- Existing capacity of STPs : : 235 MLD
- 62 % Treated rest 38% or 144 MLD not properly treated.
- Unhygienic City (rank 215 among 476 Cities, Swachta Surveksan)

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Source: RUIDP

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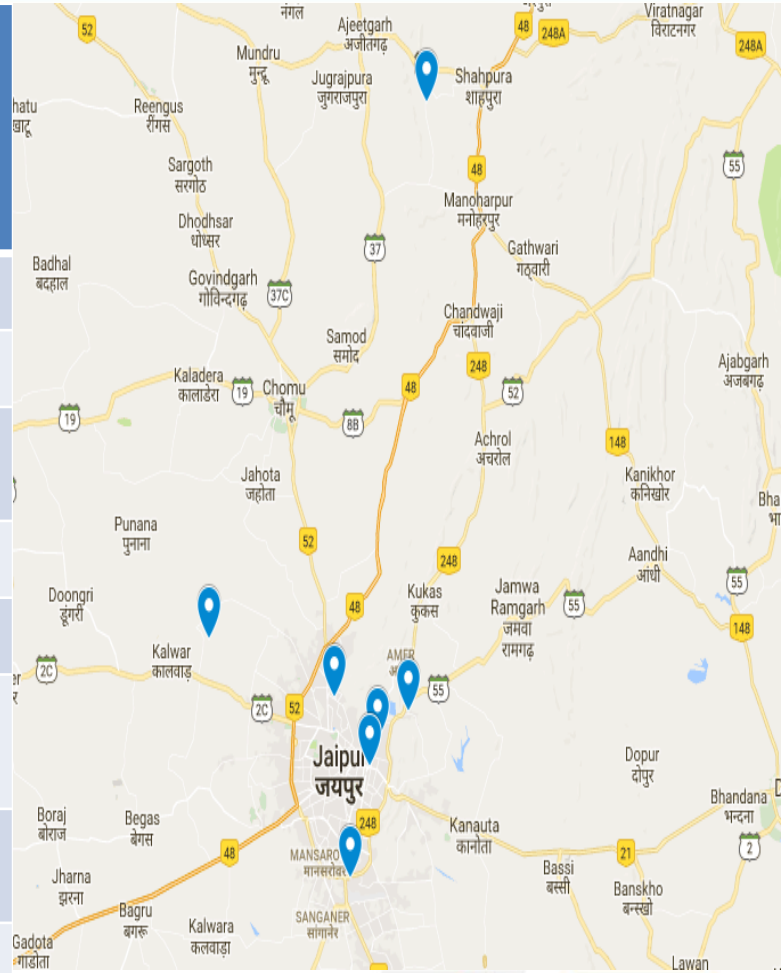
STPs in Jaipur City

S. No	STP Location	Project Funded by	Year of commission	STP installed Capacity MLD	Technology
1	Delawas-I	ADB	2006	62.5	ASP
2	Delawas-II	ADB	2011	62.5	ASP
3	Jaisinghpura Khor	ADB	2011	50	ASP
4	Amer Road	ADB	2006	27	ASP
5	Jawahar circle	RUIDP	2010	1.0	MBR
6	JDA Ramnivas Garden	RUIDP	2014	1.0	MBR
7	Vidyadhar nagar	RUIDP	2014	1.0	MBR
8	Gajodharpura	RUIDP	2013	30	ASP



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Government Initiatives

Formation of RUIDP i.e. Rajasthan Urban Infrastructure Development Project,
→ led to the implementation of STP project at Delawas

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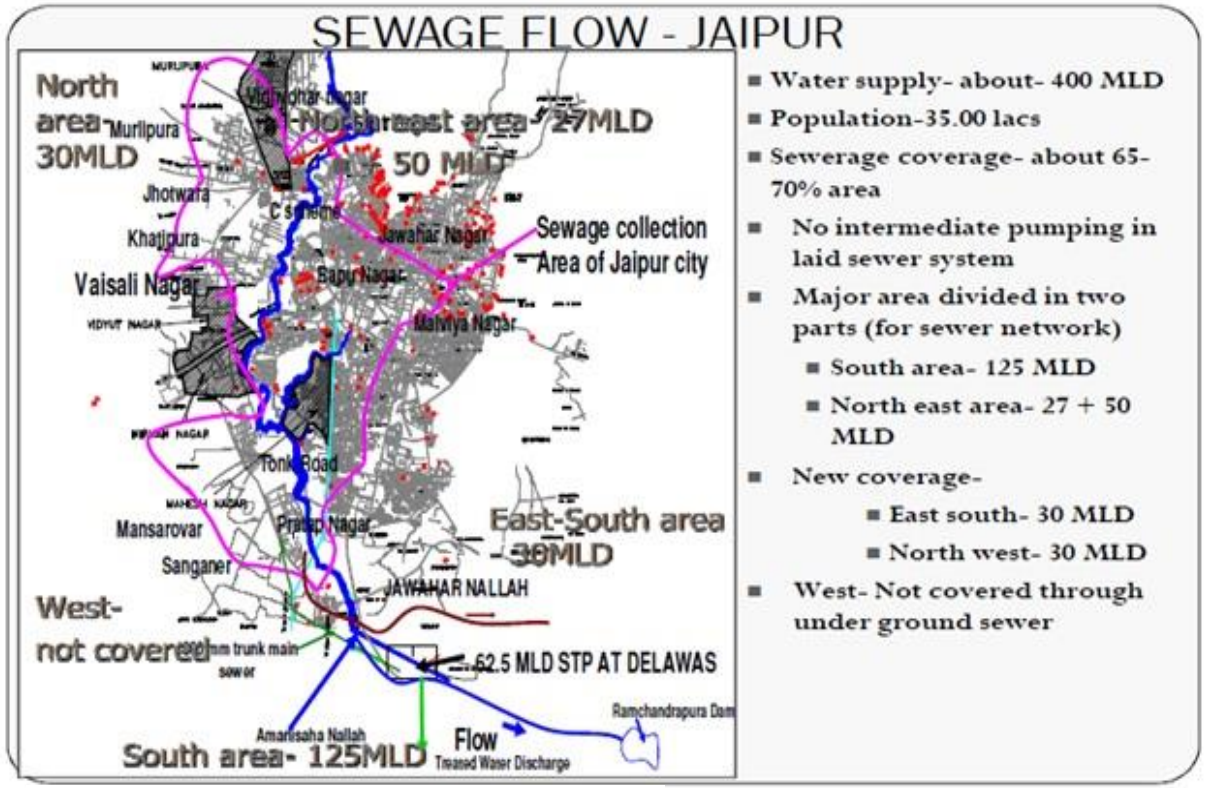
Sewerage coverage area South Jaipur & General Lay out of STP



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Raw Sewage Characteristics

Parameters	Initial Effluent	Final Effluent
pH	7.12	7.68
TSS	620 mg/l	40 mg/l
COD	776 mg/l	170 mg/l
BOD	320 mg/l	27 mg/l

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Prior to STP Commissioning

i. Wastewater drained into open road side drains
ii. Open drains blocked by waste dump by residents/ passer-by
iii. Waste Water discharged into Amanishah nallah
iv. Highly contaminated & harmful chemicals, also includes discharge of industrial waste
v. Untreated sewage used for growing vegetables/crops by farmers.
vi. Increasing stomach/intestine disease
vii. Underground water quality deteriorated
viii. Strong Foul smell in surrounding areas.

Post Commissioning of 125 MLD STP

- Direct contact eliminated, odour issue reduced
– Removing toxins, BOD within limit, Effluent used for agriculture.
– Land prices increased,100 times to 250 times.
– Huge infrastructure growth, Private hospitals, private universities
– More employment opportunities, better urban services.
– More residential complexes , enhanced social connectivity.
– No issues of water borne diseases / diarrhoea / infant & child mortality
– Effluent used for agriculture, beautification, revenues from farming.

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Conclusion: Delawas STP Plant

- Government of Rajasthan initiatives were an important success factor (e.g. formation of RUIDP).
- Perfect example, effectively dealing city wide sanitation & minimizing ground water contamination.
- Energy incentive, collects waste water from 25 Km surrounding
- No chemicals used, Recharges groundwater, effluent used for irrigation.
- Perfect example of waste to energy .
- Bringing organic pollutant concentration BOD below 30 mg/litres.
- Technological modifications to bring BOD below 20 mg/litres.
- JMC in a win-win situation, selling bio gas & electricity
- Delawas STP plant a success story created by ADB ,showcased to visitors, technical staff and research students across Jaipur.