



A tale of three cities

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On the ground in ... Vizag

Cyclone 'Hudhud' path

'Stripping' of structures in high wind

Small & medium industries impact

Shipyards impact

Secondary impacts – water supply canals

Agricultural impact

Shoreline erosion

- Port & shipyard – downstream impact on supply chains of large national industries
- Civic infrastructure and MSME (Micro, Small and Medium Enterprises) – high impact from building design
- High secondary risks – e.g. water supply canal breach, potential damage to fuel and chemical storage
- Major livelihood impact – 60,000+ hectares of horticultural and agricultural damage
- Climate change will drive frequency of incidents

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On the ground in ... Allahabad

- Cities as “cogs in a wheel” – part of much larger ecological, social, commercial systems

City	Area of city (ha)	Area with sewerage (ha)	Un-sewered area (ha)	Un-sewered area (%)	Drains
Kanpur	25,810	7,558	18,252	71	37
Allahabad	9,516	2,013	7,507	78	57
Varanasi	18,058	1,635	6,422	86	73


Source: UP government 2010, Provisional results of the Executive Committee of the State Ganga River Conservation Authority, La draw, nswrnr

Stretch	Discharge (MLD)	BOD load (kg/day)
Kanpur	800	634,915
Unnao	78	12,988
Etahpur-Radwanilly	1,491	36,148
Allahabad	294	35,943
Minapur	149	9,471
Varanasi	411	9,607
Total	3,622	738,152


Source: CPCB 2015 Pollution Assessment: River Ganga, Central Pollution Control Board, MoEF, July

Basin	Area (ha)	Population	City
Basin-1 (Palka mata)	28.80	26,264	Allahabad
Basin-2 (Palka mata)	28.20	5,656	Allahabad
Basin-3 (Kachha mata)	14.20	1,329	Allahabad
Basin-4 (Kachha mata)	48.50	2,276	Allahabad
Kodari drain	20.00	1,043	Allahabad
Ponghat drain	8.00	761	Allahabad
Solari drain	34.80	1,087	Allahabad
Mariya drain	65.00	3,389	Allahabad
Musafira drain	46.00	538	Allahabad

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On the ground in ... Ajmer




- Ajmer city's own SWOT analysis identifies:
 - Poor availability of water is major threat
 - Improper channelization of rainwater and backflow into major drain from Annasagar lake over HFL
- Identifies water leakage prevention, rainwater harvesting incentives and recycling of waste water as some key initiatives

		Target	Achieved
Water Supply	Connections	100%	83%
	Per capita supply	135 lpcd	100 lpcd
	Metering	100%	40%
	ContinADay of supply	24 Hrs	1 Hr
	Quality	100%	80%
	Cost Recovery	100%	38%

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Smart cities in India ...



... it's about *depth*

- Issues are harder – “constrained optimization problems”, solutions non-trivial
- Capital is NOT the only constraint (i.e. you can't throw money at the problem !)
- Solutions have to be holistic, long-term and cut across *infrastructure, process, citizens*
- There's an opportunity to *leapfrog* – don't have to “re-learn”

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Smart is ... Resilient

Integrated operations for multi-agency coordination

Deep analytics for multi-hazard risk assessment & mitigation

Data-driven decision support for emergency response

Recovery planning under constraints

Smart is ... Clean

Key design point : What is the optimal design of the end-to-end waste management system – taking into account physical and commercial constraints ?

Note : Varanasi data shown

Coverage of sewage system in Varanasi

Open defecation hotspots in Varanasi

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Smart is ... Sustainable

- An end-to-end **resource management** approach to Water

Mapping of all water assets and metrics across stakeholders

Standardised representation of assets

Proactive operations

Hydraulic models for leak / pressure management

Historical information and trends

corporation

Citizens and Information
Foundational building blocks of India's Smart Cities

Civic issues

Inaccessible Sidewalks

Condition: **Report** | Bad | Terrible

Type: **Step** | Pothole | Other

Size: **Small** | Medium | Large

Record voice note

Upload

Water Miser

Traffic demand management

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