



Excreta Matters: 7th Citizens' Report on the state of India's Environment

An agenda for water-prudent and
waste-wise India



Need to reinvent

- Rapid urbanization is creating new water stresses
- Violence is growing: Rural – urban, rural - industrial
- Already cases of protest and police firing over water allocation to industry or city
- **Indian cities need to become prosperous without more water**
- How is that possible?

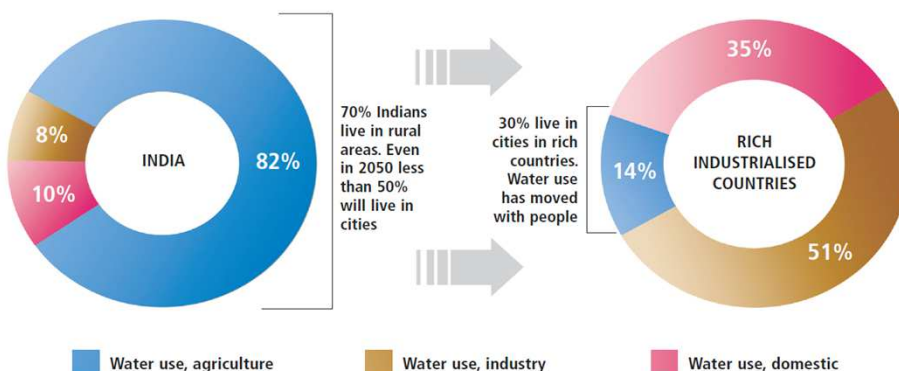


Water for growth?

Cities & industries need water for growth

WATER TRANSITION THAT WILL NOT HAPPEN

Urban-industrial growth needs water but in India, even as this sector will grow, people will continue to live in rural areas and depend on agriculture



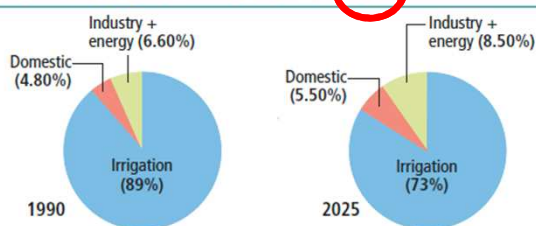
Source: Anon 2009, *Water in a Changing World*, Third UN World Water Development Report, UNESCO, Paris



Vague old water sums

UPDATE REQUIRED: THE LAST TIME INDIA ESTIMATED ITS FUTURE WATER USE WAS IN 1999

Category	1990 (BCM)	2025 (BCM)
Irrigation	460	688
Domestic	25	52
Industry + energy	34	80
Total	519	942



BCM: billion cubic metres

Source: Anon 1999, National Commission on Integrated Water Resources Development, Ministry of Water Resources, Delhi



Recent information shows otherwise

SOBERING PROJECTIONS: THE FUTURE OF SIX KEY INDUSTRIAL SECTORS (IN MLD)

Sector	Freshwater withdrawal 2008-09	Freshwater consumption 2008-09	Projected withdrawal 2020-21	Projected consumption 2020-21
Power	108,334	13,995	117,940	23,597
Paper and pulp	2,375	238	3477	483
Iron and Steel	1,860	674	4482	1,901
Fertilizer	545	273	652	379
Cement	249	249	674	674
Aluminium	441	27	1246	94
Total	113,803	15,455	128,471	27,132

71-CITY SURVEY: HOW LEAKAGE LOSSES CREATE THE REAL SHORTFALL IN WATER ACTUALLY SUPPLIED

	Demand 2005 MLD	Supply 2005 MLD	Gap in 2005 MLD	Shortfall in supply, 2005 (%)	Leakage loss MLD	Supply after loss, 2005 (MLD)	Demand-actual supply gap, 2005 (MLD)	Shortfall in actual supply, 2005 (%)
Metro	17,987	16,591	1,396	8	6,150	10,441	7,546	42
Class I	2,879	2,775	104	4	706	2,069	811	28
Class II & III	129	123	7	6	21	101	28	22
Total	20,996	19,489	1,507	8	6,877	12,611	8,385	40

MLD: Million litres daily

Source: Anon 2011, 71-City Water-Excreta Survey, 2005-06, Centre for Science and Environment, New Delhi

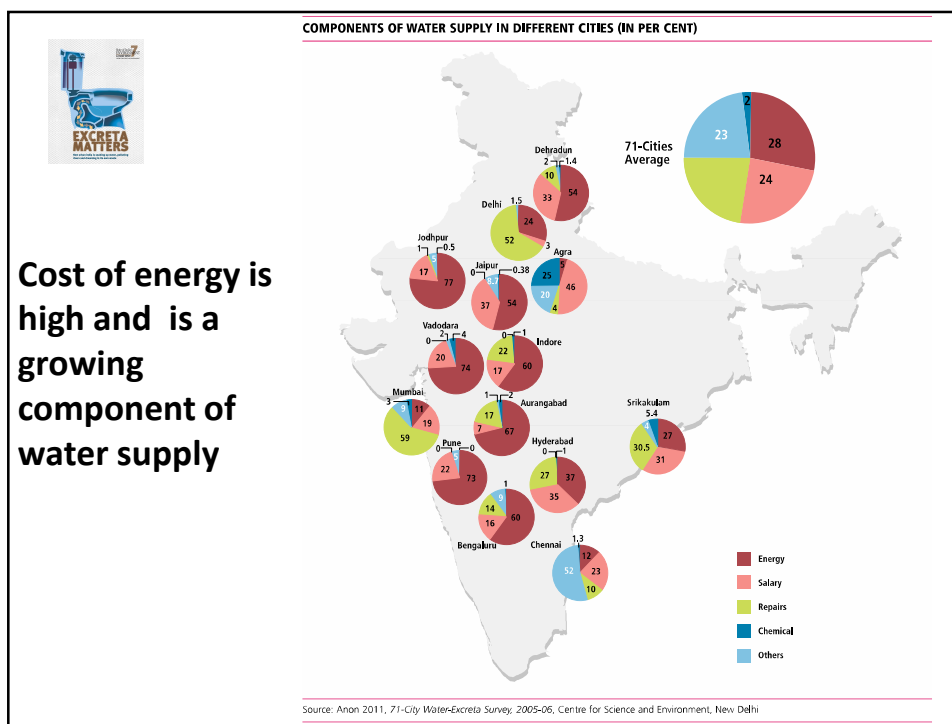
71-CITY SURVEY: WATER THAT ACTUALLY TRICKLES DOWN TO SLUMS



Source: Anon 2011, 71-City Water-Excreta Survey, 2005-06, Centre for Science and Environment, New Delhi

Leakages

Water inequity grows



EXCRETA MATTERS

Groundwater: **abused**

Those that do not get piped water suck out groundwater

But this is not accounted for

Cities only consider 'official' groundwater use

Lakhs depend on private wells, tanker mafia & bottled water

No recognition of this water source; **no respect** for its management



Water → waste

Cities plan for water, **never for waste**

We take in water, excrete sewage

More water = more waste

There is **no account** for sewage

Cities have **no clue** how they will convey waste of all, treat it, clean rivers

Cities **only dream** of becoming New York or London



Sewage **sums**

Sewage generated = 38,255 MLD

Capacity to treat = 11,788 MLD (30%)

Sewage actually treated = 8,251 MLD(22%)

Cost of treating remaining 26,467 MLD ranges from Rs 26,500 to Rs 105,868 crore

Delhi and Mumbai alone have **40 per cent** of sewage treatment capacity in the country

78 % sewage is officially untreated and disposed off in rivers, lakes, groundwater

Fill it, flush it, forget it



Planning for **hardware**

Cities plan for treatment not sewage

- Treatment plants are not simple answers
- Can build plants to treat, but there is no waste being conveyed for treatment
- Most cities do not have underground sewage but engineers sell pipe-dreams of **catching up with infrastructure**
- Politicians buy pipe-dreams

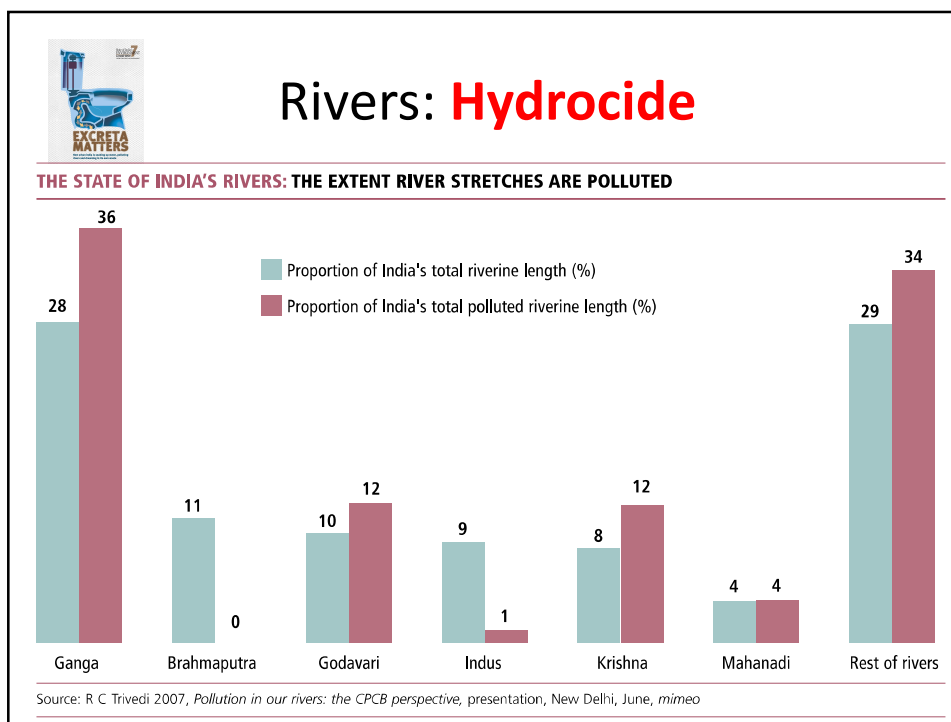


Partial treatment=**pollution**

Cities do not control pollution

Cost of building system is high

- City can build sewage for **few** not all
- Spends on building pipes, repair and energy costs of pumping to treatment plant of this waste
- Spends to treat waste of **few**
- Treated waste of **few** gets mixed with untreated waste of **majority**
- The result **is pollution**



Generation of **lost** rivers

- Delhi knows only Najafgarh – a dirty drain of Yamuna. It was Sahibi – which once flowed from the Aravalli into a jheel
- Hindon – River or Drain
- Kali – nadi or drain
- Ludhiana knows Budha Nullah as a drain. But this was a darya – a river

Generation of lost rivers. **How many more will we have to lose before we remember**



Cannot pay **full** costs

Infrastructure is not a simple answer

Assumption that infrastructure is about costs is **flawed**

1. Water tariffs are high in many cases
2. Tariffs are high but recovery is poor because meters do not work
3. Poor pay high costs; money or with their health
4. Where tariffs are high, people move to groundwater
5. Water-sewage-pollution costs are high and **unaffordable by all**



Economics is not a simple answer

Cities cross-subsidize with high tariff on industries and commercial

But industries move to groundwater

Unsustainability grows

Cities unable to recover costs

IT IS A CROSS-SUBSIDY: WHAT CITIES CHARGE FOR INDUSTRIAL WATER USE

City	Commercial (Rs/kl)	Industrial (Rs/kl)
Agra	17.50	35
Amritsar	6.40	6.40
Allahabad	7.50	12.50
Alwar	4.68	11
Aurangabad	16	39
Bengaluru	36-60	60
Bhilwara	11-16.50	11-16.50
Bhubaneswar	8	8
Chennai	50-60	50-60
Cuttack	2.88	2.88
Delhi	10-100	10-100
Dhanbad	7	7
Gwalior	20	30
Hyderabad	35	35
Indore	11	22.50
Jabalpur	10.50	10.50
Kolkata	10	NA
Lucknow	6	6
Nagpur	12	20
Pune	16	16
Rajkot	12	12
Ujjain	25	25
Vadodara	10.80	10.80

kl: kilolitre;
Source: Compiled



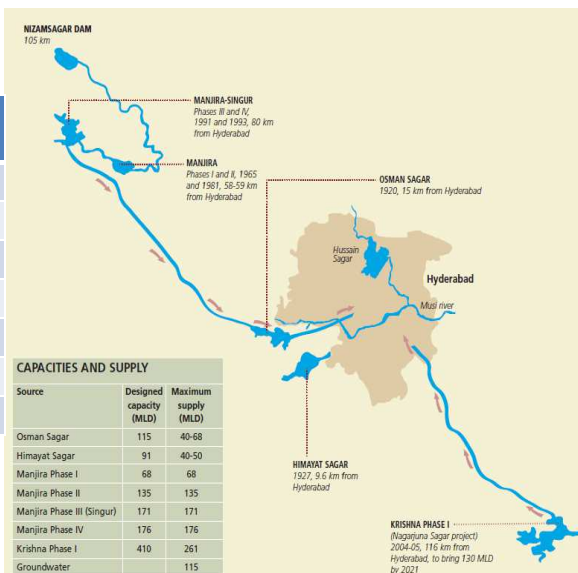
Hyderabad's water-sewage sums

Municipal	2005		2011	
Population	7 m		8.2 m	
Water demand	HMWSSB	CPHEEO	HMWSSB	CPHEEO
	1300 MLD (187 lpcd)	1216 MLD (175 lpcd)	1833 MLD	1435 MLD
Sources	Surface and groundwater			
Source (official)	Groundwater	Surface	Groundwater	Surface
	12%	88%		
Actual supply after loss	558 MLD (after 40% loss)		918 MLD, 40% loss (UAW)	
Population served	70% covered by system			
Water treatment plants	5			
Sewage generated	HMWSSB	CPCB	HMWSSB	CPCB
	600 MLD	605 MLD	1180 MLD	
Length of sewage network	2400 km. 100% in 165 sq km central area		Pipelines being laid in 450 sq km peripheral areas	
Sewage treatment facilities	2		3, capacity 533 MLD	
Actual treatment			426 MLD	



Hyderabad Water Supply

Source	Year	Distance (KM)
Osman sagar	1920	15
Himayat sagar	1927	9.6
Manjira – 1	1965	58
Manjira – 2	1981	59
Manjira – 3	1991	80
Manjira – 4	1993	80
Krishna	2004	116



Hyderabad Water Supply

- HMWSSB in charge of water supply and sewage of Hyderabad and adjoining municipalities
- City draws water from Nagarjuna Sagar 100 KM and Godavari 186 KM away (also lifted 500 M)
- Total distribution network is 2300 KM, 0.6 million connections (77% domestic, 20% slums)
- 115 MLD groundwater drawn officially. Unofficial figures are double this



Hyderabad Water Supply

- Early water sources – Hussain sagar, Osman sagar and Himayat sagar
- Network of 50 lakes built to store water
- Surface water has tanked
 - 934 tanks recorded in 1973
 - 834 in 1996
 - 18 ponds <10 Ha lost
 - From 1964 – 1990, area under water bodies fell from 2.5% to 1.5%



Water crisis as tanks disappear

- Encroachments and pollution are destroying Hyderabad's tanks
- Extensive flooding and backflows of sewage e.g., Nadeem Colony
- Interconnecting channels have been blocked worsening floods e.g., by Hyderabad Golf Association
- Projects with an impact on tanks
 - Taj Banjara
 - Lanco Hills
 - Aliens Project
 - Aparna Sarovar



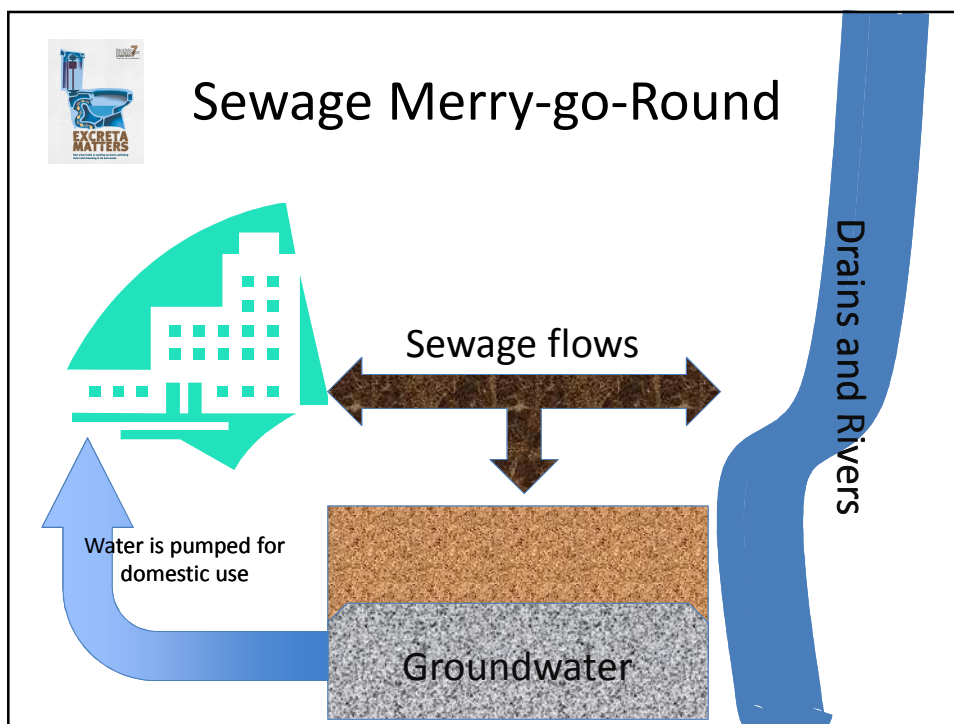
Musi River

- Emerges from Ananthgiri hills 90 KM west of city and runs 28 KM within city limits
- Drainage includes Hyderabad municipal corporation area + surrounding municipalities
- Untreated sewage discharge 700 - 800 MLD from city
- BOD 80-100 X bathing water standard (3 mg/litre)



Sewage Situation

- HMWSSB 1180 MLD
- 100% coverage of lateral sewers in core area
- 18 nallahs carry treated and untreated sewage to Musi River
- Peripheral areas remain poorly serviced, largely with septic tanks cleaned by informal service providers
- Sewage from upmarket areas flows into low-lying talabs



The Way Ahead – Water

- **Investment of Rs. 4622 crore**
 - 100% coverage by 2016
 - Increase supply to 8 hours a day by 2016
 - 24X7 by 2021
 - Reduce losses to 15% by 2021



The Way Ahead – Sewage

- Rs. 1076 crore for sewerage network + treatment plants
- 10 new plants to treat 600 MLD under National River Conservation Directorate along Musi River
- Use different technologies to treat sewage to < 5 BOD (nearly bathing quality)
- 51 MLD plant to be commissioned shortly



Reform agenda: affordability

Action: Cut costs of water supply

- Augment local sources. Give them legal protection. These include lakes, ponds, feeder channels and catchments
- Recharge/store groundwater based on geo-hydrological studies



Water Conservation

- **R**euse/ **R**ecycle water. Grey water for gardening
- Treat sewage for industry/farming :: Use a mix of technology
- Treat used water for domestic use
- Replace catchments that have disappeared with RWH from all built-up areas (roofs, roads, etc) to recharge tanks and ponds – augment local water quantity



Plan for **sewage**

Action: Plan for sewage before water

Sewage = resource

- **No water scheme must be passed without sewage component**
- Plan **differently** for sewage treatment **now**
- Mantra is decentralisation
 - Use open drains/rivers as treatment zones
 - Use lakes and ponds as treatment zones
 - Treat locally so that treated water can be used locally

Sewage must be our obsession



Excreta does **Matter**

- Is about **affordable** urban growth
- Is about **inclusive** urban growth – planning for all and not some
- Is about **sustainable** urban growth – planning for true-green cities
- Is about our need to re-invent **growth without pollution**



We all live downstream

