



## Excreta Matters: 7<sup>th</sup> Citizens' Report on the state of India's Environment

An agenda for water-prudent and waste-wise India

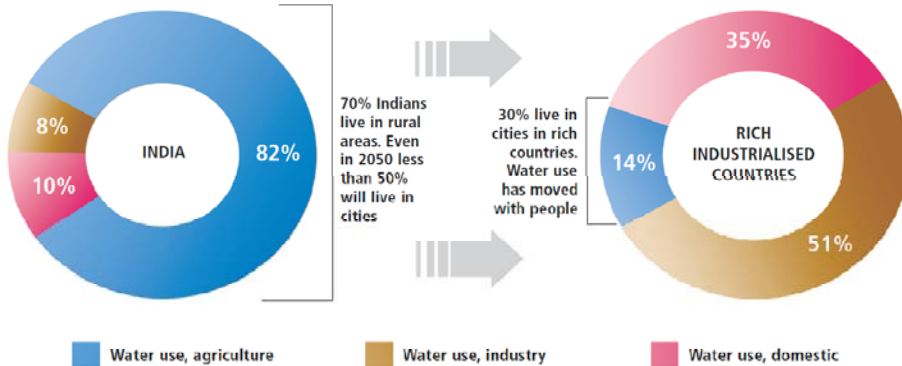


## Water for growth?

Cities-industries need water for growth but India's water use is not changing with its demographics

### 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

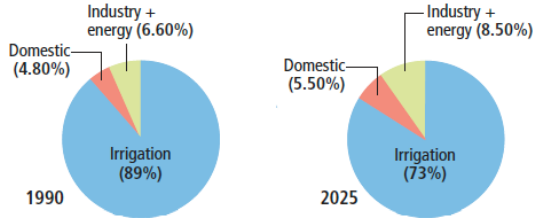


Source: Anon 2009, *Water in a Changing World*, Third UN World Water Development Report, UNESCO, Paris



**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
<b>Total</b>	<b>519</b>	<b>942</b>



BCM: billion cubic metres

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



**CSE study shows water use in key industrial sectors will double by 2020-2021**

**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
<b>Total</b>	<b>113,803</b>	<b>15,455</b>	<b>128,471</b>	<b>27,132</b>

MLD: Million litres daily

Source: Chandra Bhushan 2010, *Challenge of the New Balance*, Centre for Science and Environment, New Delhi



## Need to reinvent

- Otherwise violence will grow
- Already cases of protest and police firing over water allocation to industry or city
- **Indian cities and industries need to grow but with be water prudent. Be water-waste wise**
- How is that possible?



## Our study

- [file:///localhost/Users/sunitanarain/Desktop/Excreta matter vol.1 PDF/Final chapters for book/Master Excel Checked.xls](file:///localhost/Users/sunitanarain/Desktop/Excreta%20matter%20vol.1%20PDF/Final%20chapters%20for%20book/Master%20Excel%20Checked.xls)



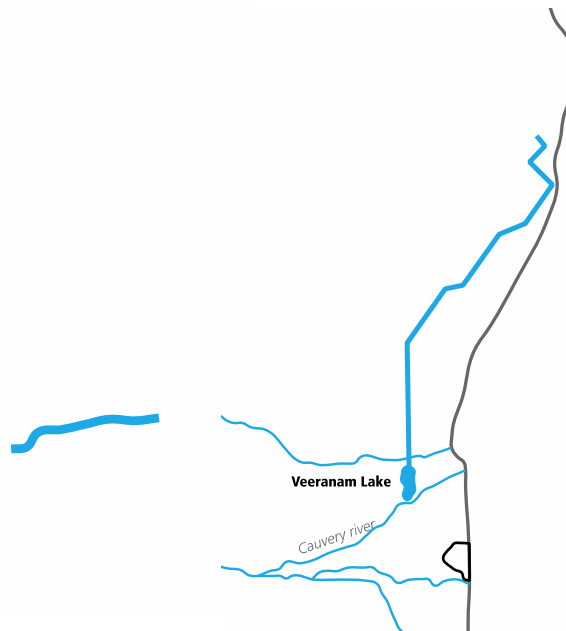
71 city data analyzed  
City water-waste profiles  
Where does water come?  
Where does waste go?  
Simple questions  
But not asked  
Never answered



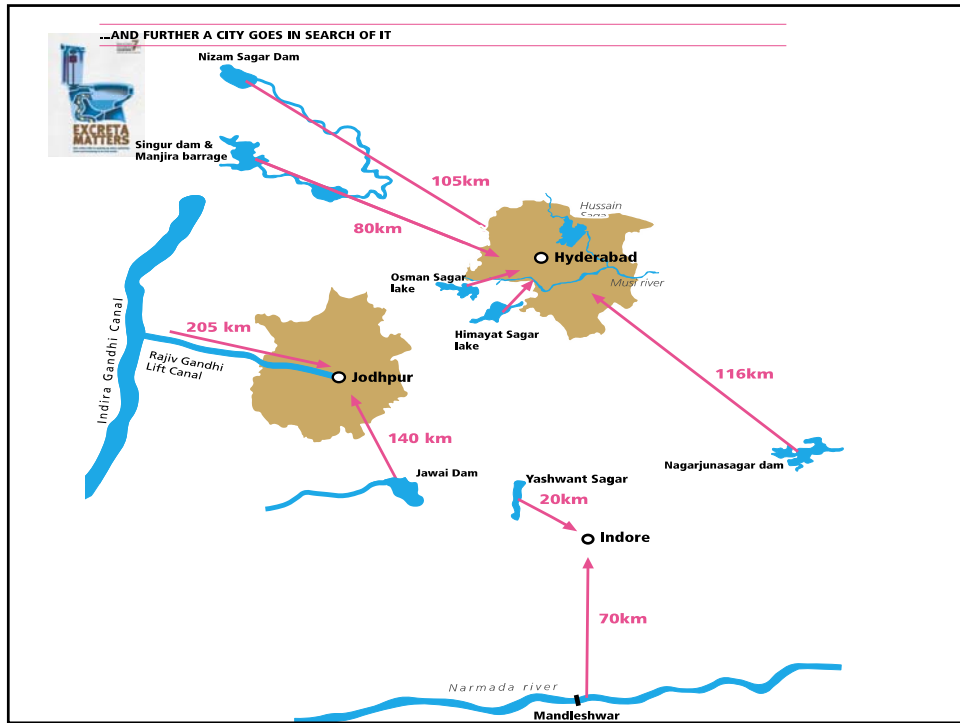
## The water story

Water supply in cities: Planners obsessed with water, **not supply**

- Water sourced from further and further away
- Leads to increasing cost of supply
- Leads to high distribution losses
- Less water to supply at end of pipeline



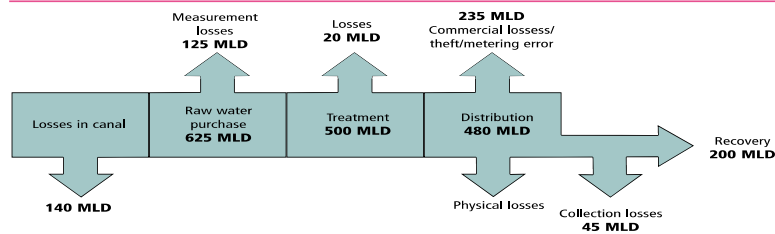
Source: Anon 2011, 71-City Water-Excreta Survey, 2005-06, Centre for Science and Environment, New Delhi



## Nagpur: **lost** accounts

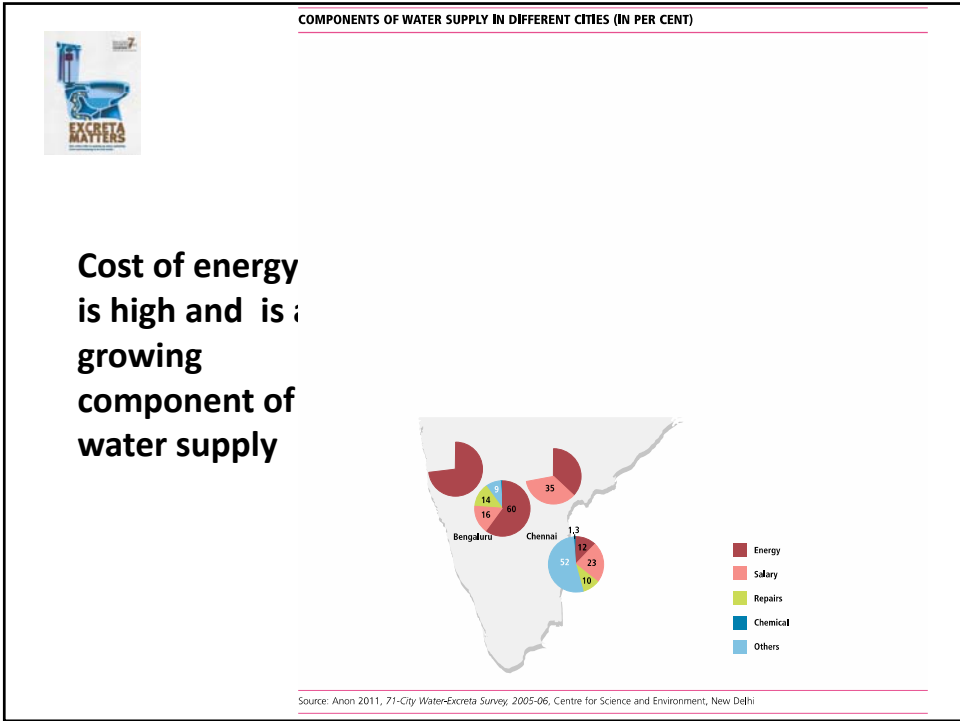

- Only city with accounts of **where** water is lost
- **765 mld** – sourced from tiger reserve of Pench – 45 km away. Ends with **200 mld**

DRIP DROP OFF: NAGPUR'S WATER HIGHWAY ILLUSTRATES HOW WATER GETS LOST



System efficiency : 32%  
 Annual loss : Rs 56 crore  
 Loss with depreciation : Rs 75 crore

MLD: million litres daily  
 Source: S S Hasak, 2011, "24x7 Water Supply Project of Nagpur", presentation made to Union ministry of urban development committee, April, *mirro*

**Political economy of water**

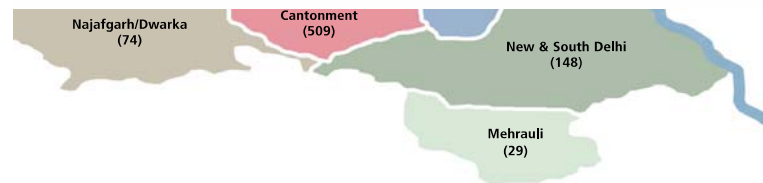
System is capital and resource intensive  
 System is designed **not to work for all, only for some**

**Add to stress on groundwater**  
**Leads to bad health and crippling costs**



= 'Official inequity'

DELHI: CAPITAL INEQUITY (IN LPCD)



LPCD: Litres per capita daily; NDMC: New Delhi Municipal Corporation  
 Source: Sunita Narain et al 2007, *Sewage Canal: How to Clean the Yamuna*, Centre for Science and Environment, New Delhi



## Part II: Political economy of defecation

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



## Excreta: **sums**

- 2009:

Sewage generated = 38,255 mld

Capacity to treat = 11,788 mld (**30%**)

Sewage actually treated = 8,251 mld (**22%**)

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

**We flush, we forget**



## 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





**Cities do not have drains**  
**New growth cities are growing without drains**  
**Backlog and front-log impossible to fix**  
**As cities fix one drain, another goes under**

**71-CITY SURVEY: AREA COVERED BY CLOSED DRAINS  
 SHOWS REAL STATE OF SEWAGE COLLECTION**

% of area covered

0-10	Cuttack, Guwahati, Jabalpur, Jammu, Ranchi, Thane, Aizawl, Bathinda, Bhilwara, Siliguri, Srikakulam
10-30	Agra, Alwar, Aurangabad, Indore, Mathura, Meerut, Puducherry, Thiruvananthapuram, Dehradun, Dewas, Hubli-Dharwad, Jhansi, Kozhikode, Lucknow, Solapur, Tumkur, Udaipur, Ujjain, Dhanbad
30-50	Allahabad, Bengaluru, Bhopal, Delhi, Lucknow, Patna, Srinagar, Amritsar, Bhubaneswar, Jodhpur, Mumbai
50-70	Faridabad <sup>2</sup> , Hyderabad, Jaipur <sup>1</sup> , Kanpur, Kolkata, Nagpur, Gwalior, Mussoorie, Nainital, Rajkot, Vadodara, Yamunanagar
> 70	Chennai, Pune, Surat, Gurgaon <sup>2</sup>

<10

Guwahati, Jabalpur, Jammu,  
 Ranchi, Thane, Aizawl,  
 Bathinda, Bhilwara, Jammu,  
 Jabalpur, Siliguri,  
 Srikakulam

<sup>1</sup>Claims 80% coverage in CSE survey, 65% in City Development Plan for JNNURM; <sup>2</sup>Faridabad and Gurgaon: only old-city within municipal limit included  
 Source: Anon 2011, *71-City Water-Excreta Survey, 2005-06*, Centre for Science and Environment, New Delhi



## Bengaluru: sewage sums

- 3610 km of sewage pipes
- 14 sewage treatment plants = **781 mld**
- Generates 800-1000 mld of sewage
- **But treats only 300-400 mld**
- Rest does not reach
- Now plans to build 4000 km more pipes
- **Builds, grows and more lines need repair**
- **Catch-up that does not catch-up**



## Partial treatment = pollution

### Cities do not control pollution

Cost of building system is high

- City can build sewage system for **few**
- Spends on building pipes, repair and energy costs of pumping to treatment plant of this waste
- 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
- Mumbai knows only Mithi – a dirty drain. It even calls it a drain. But this was its river
- 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**



## Public vs Private?

- Not the question
- Investment is the issue
- Management is the issue

### **BUT**

- Private sector experience in this sector **limited**
- Current contracts about public investment, private profit: **PIPP**



## Cannot pay **full** costs

### **Infrastructure is not a simple answer**

If water-sewage-pollution costs are high then recovery will be difficult

Current contracts underestimate costs of system – building, refurbishment, repair

Current contracts do not plan for sewage

PPP will not work. Must design system for **affordability** and **sustainability**



## AGENDA FOR FUTURE



### **Affordable water**

- **Agenda: Cut costs of water supply**
- Supply to all and not some

To reduce losses in distribution; reduce costs of supply, cities must depend more on local water systems. **Catch water where it falls**

Cities **must legislate** to protect local water bodies, **do rainwater harvesting**



## Lakes: **Present lost**

As groundwater is not considered as critical for water supply, recharge is neglected

Land is valued, **water is not**

No legal protection for city lakes, catchment and drainage systems

Sponges of cities being destroyed. **Deliberately**



## Lakes: **Future gain**

- Climate change is new threat
- Extreme rainfall events will grow
- More rain, fewer rainy days
- Cities need sponges to capture rain, recharge for scarcity
  
- Planning for local water sources will be key water security and climate change



## Reduce water use

**Agenda: Demand and not supply management**

**Must reduce wastage, reduce intra-city inequity, reduce demand of water**

Promote water-efficient appliances

Promote **water-prudent** cities

Promote **water-wise** societies



## Plan for **sewage**

**Agenda: Plan for sewage before water**

- **No water supply without sewage component**
- **Sewage must be our obsession**



## Plan **differently** for sewage

### **Design to treat all waste**

- Treat waste in open drains and not wait to build all drains

### **Treat waste to recycle and reuse water**


- Treat waste to generate wealth – not use water as carrier or for waste disposal



## Treat local; **recharge**


### **Treat waste locally so that reuse is possible locally**

- Cut costs of piping and pumping
- Treat using microbes/separation/biotic oxidation systems etc
- Treat to reuse, not to waste
- Every lake can be a water-treatment zone




**Amarnath ya**  
 in cold climat  
 altitude; diffic  
 sewage is tre  
 microbes  
 Sewage is cle  
 than 15 BOD  
**Waste is turn**  
 and returned to  
 hydrological cycle

**Re-design the flush toilet**



*Cleaning the waste of millions: toilets are dosed with microbes and so don't smell; waste goes to a reed bed and oxidation tank.*



**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 need to re-invent **growth but without pollution**





# Our common agenda

**Flush but do not forget**



**We all live downstream**

