Setting the tone: The importance of water and its management

Centre for Science and Environment
Twin challenges

- **Rapid urbanization** – massive growth in cities in the global South; means more water for their needs and more waste
- **Climate change** – increased weather variability
- **Problem** is that our pattern of urbanization and with it pattern of water-waste management is highly resource intensive; capital intensive
- **Leading to inequity; unsustainability**
NOT ALONE

But inevitable?
Global SINKS
Ten metropolitan cities of the world that are on the verge of an imminent water crisis

Number of months in which water scarcity is 400%:
- 0
- 1
- 2
- 3
- 5
- 6
- 9
- 12
- No data
- 200 water-stressed cities of the world

Prepared by UIE/CSE Data Centre
Infographic by Rizwanur Singh, Analysis by Soumya Sengupta
Around 200 cities running out of water

- **Nairobi** – Sources of water – Dams, springs and aquifers. Faces water deficit of 0.2 million cubic metres per day

- **Bengaluru** – Sources of water - Rivers and groundwater are the main sources. The total number of extraction wells has shot up from 5,000 to 0.45 million in the past 30 years. The water table has shrunk from 10-12 metre (m) to about 76-91 m in just two decades. Recharge of groundwater is minimal due to unplanned urbanisation

- **Sanaa, Yemen** – Source of water – Groundwater. The city dug 200-300 m down in search of water and even reached the fossil aquifer – which will be over in a decade
Climate risked world increased vulnerability

• Climate change is real
• Resulting in increasing extreme and variable weather events
• Add to this
• Our mismanagement of water is real
• Resulting in water scarcity; pollution; flood and crisis of health and loss of livelihood
Water wisdom is key

• Rain will be seasonal; more variable
• Cities will need more water for growth
• Industries will need more water for growth
• But cities and industries will, if we do not, plan today and differently, use clean water and discharge untreated waste water
• Pollution will increase
• Water scarcity will increase
Question?

• Is the current system of water-waste management in cities appropriate for us?

• Can we build water-secure Africa or Asia if the system is designed so that it can meet the needs of some and not all?

• Can we do this in this age of climate change-risk unless we rethink and rework the system to plan for all and to plan for sustainability
Paradigm of water

Water sourced from further and further away
Leads to increasing cost of supply
Leads to high distribution losses
Distribution loss means less water to supply at end of pipeline
Less water means more costly water
Cannot supply to all or take back waste of all

Leads to inequity (Cape Town: 15% people get 4% water supply)
‘Official inequity’

DELHI: CAPITAL INEQUITY (IN LPCD)

Narela (31)
Civil lines & Rohini (274)
Pahar Ganj (201)
Old City (277)
Shahdara (130)

West Delhi (202)
Karol Bagh (337)
NDMC (462)

Najafgarh/Dwarka (74)
Cantonment (509)
New & South Delhi (148)
Mehrauli (29)

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
Groundwater: abused

When water supply does not reach poor people use groundwater
When water supply tariffs increase rich people use groundwater
But this is not accounted for
Cities only consider ‘official’ groundwater use
Millions depend on private wells, tanker mafia, bottled water
No recognition of this water source; no respect for its management
Where pipeline does not reach, people depend on groundwater. Falling groundwater levels tell us about inequity.

1960
Where water was found (in metres, below ground level)

- 0 to -2
- -2 to -5
- -5 to -10
- -10 to -20
- -20 to -30
- -30 to -45
- -45 to 50
- Delhi quartzite

2002
Where water was found (in metres, below ground level)

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- -5 to -10
- -10 to -20
- -20 to -30
- -30 to -45
- -45 to 50
- Delhi quartzite

LPCD: Litres per capita daily
Source: Central Ground Water Board, 2002
Present and future lost

Groundwater recharge requires **local recharge**
But waterbodies are discounted. Not considered part of water system
Water bodies in cities are critical to hold excess rainwater during floods; recharge groundwater
With climate change role of **sponges** more critical
Otherwise we go **from floods to droughts**
Water=waste

Cities plan for water, forget waste
80% water leaves homes as sewage
More water=more waste

But cities rarely have funds to take back waste of all, treat waste of all and then re-use and recycle waste of all
Partial treatment = pollution

The current water-sewage is both capital intensive and resource intensive.

We can take the waste of some in our cities, connect it to underground pipes, transport it to treatment plants, even treat the waste and discharge clean water to rivers.

But cost of this system is high.

So we can subsidize the treatment of waste of some and not all.
Inequity = pollution

• If system cost is unaffordable for all then it will be unsustainable for all

• If we cannot take back the waste of all and treat it then it will be mixed with the treated waste of some

• = Pollution of our rivers and waterbodies
Agenda for water wise

- Have to reduce cost of water supply
- Requires cutting length of pipeline
- Requires ensuring cost of treatment of water is kept low (pollution is low)
- Requires recharge of groundwater for supply of local water
- Bottom-line: cut costs so that we can supply to all and take back waste of all
Agenda: focus on wastewater

• Focus on wastewater and not just on water
• This is where our opportunity is
• Current system is about bringing water (long distance) and then taking back waste (long distance)
• Today we need plan to reuse and recycle wastewater -- every drop to be converted back to water. We do not consume water
Agenda: Reuse waste

• In many parts of our world people are disconnected from official pipelines
• This ‘on-site’ waste treatment is not part of problem but part of new solution
• Today waste from on-site systems taken and discharged into waterbodies. Leading to pollution
• But can this waste be collected and put back on land?
Agenda: Re-invent Re-work

1. Plan deliberately to **cut costs** of water supply
2. Invest in local water systems
3. Reduce water demand
4. **Spend on sewage** not on water
5. Cut costs on sewage systems by making on-site part of the off-site. Investing in wastewater treatment
6. Recycle and reuse every drop
7. Plan for all and not for some
• Water is about societies wisdom to live with scarcity and excess
• Water availability is in our hands
• Requires us to do things differently – very differently
• Water management is about courage and our politics. To plan for all. To deliver for all
• Sustainability not possible without equity