What ails India’s waterbodies

SUSMITA SENGUPTA
WATER PROGRAMME
India’s first census of waterbodies finds that 97% of the water structures are in rural areas.
Waterbodies: Present lost

Groundwater is not considered as critical for water supply, recharge is neglected

• Urban planners cannot see beyond land
• Land is valued, water is not
• No legal protection for city lakes, catchment and drainage systems
• Waterbody and its catchment have been encroached upon or taken away for housing and other buildings

Sponges of our cities then get destroyed- encroached, full of sewage, garbage or just filled up and built over
Vanishing act

• Between 2000 and 2021, 10 big lakes the city of Bengaluru lost more than 90 acres of land due to encroachment
• A joint study by scientists of Indian Institute of Science published in 2016, revealed how the lakes got diminished due to unplanned urbanization
• Hyderabad is also losing its waterbodies. Between 1989 and 2001, 3,245 ha of waterbodies were lost, which is 10 times the size of Hussain Sagar, the major waterbody of the city
• Pallikarnai marshland in Chennai – flood sink in the city - The marshland that was around 5,000 hectares (ha) during independence got reduced to almost 695 ha (14 per cent of the original size) around 2016 and further to 550 ha in 2021. The only reason for all this was rapid urbanisation.
Vanishing act
Urbanisation in India

Rate of urbanisation between 1991-2031

Increased rate of urbanisation from 2.1 percent between 1991 to 2001 to 3.3 per cent between 2001 to 2011 and almost will increase to almost by more than 18 per cent between 2011 to 2031

Source: Bhagat, R B., 2011. Economic and political weekly and Ministry of Urban Development
Losing base

Loss of waterbodies to urbanisation is increasing the effects of flooding

<table>
<thead>
<tr>
<th>Population in urban India</th>
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<tr>
<td>2011</td>
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<td>377 million</td>
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<th>Metropolitan cities</th>
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<tr>
<td>2011</td>
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<tr>
<td>52</td>
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<table>
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<th>Population in metropolitan area</th>
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<tbody>
<tr>
<td>2011</td>
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<tr>
<td>160 million</td>
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<tr>
<th>Level of urbanisation</th>
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<tr>
<td>2011</td>
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<tr>
<td>31%</td>
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</table>

- Number of major flood events after 2000
- Loss in waterbodies/water spread due to urbanisation
- Population projected in 2021 and beyond (in million)

Sources: Research articles and documents; personal communication with government officials and researchers; Newspaper articles
Mumbai: flood cushions built up; Entire city went under water

1925

1994

Wet land

Built up
Mumbai: Between 1925 and 1994

• Built up: increased from 12 per cent to 52 per cent
• Lakes decreased from 28 to 18 per cent
Shrinking wetlands

**Deepor beel**: Encroached by stone quarries, dump yard. Channels to Brahmaputra are choked

**Silsako beel**: Has hotels and commercial establishments on one end, poor settlers on the other

**Borsola-Sorusola beel**: Commercial establishments. Refinery waste has polluted it

**Hansora and Damol beel**: No longer exist
Threatened catchments

Lake built to capture maximum rainwater now shows degraded hydrology
Outstanding court verdicts to save the lakes

No construction on Sukhatal lakebed near Naini lake, orders Uttarakhand High Court in 2022

The main recharge zone of the Naini lake is Sukhatal, a seasonal lake situated 50 metres above it
Outstanding court verdicts to save the lakes

Apex court rescues the second largest waterbody in the country 2020 by supporting livelihood

Fishermen lost their livelihood at Vembanad lake in Kerala – as their nets were removed by the builders
Outstanding court verdicts to save the lakes

Sukhna lake recognized as a living entity in 2020

Government of Punjab and Haryana fined Rs 100 crore each for freeing the encroachment from the catchment area of the lake
CENTRAL PROGRAMMES

• Atal Mission for Rejuvenation and Urban Transformation (AMRUT) launched in 2015 and subsequently 2.0 was launched in 2021
• Amrit Sarovar was launched in 2022
• Repair Renovation Restoration (RRR) was launched in 2005
• Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) was launched in 2006
• National Plan for Conservation of Aquatic Ecosystem was launched in 2013
Pat on the back: Delhi

- Following a NGT order, Delhi government (Delhi Jal Board – the water utility of Delhi) launched its project “City of lakes” to revive 159 waterbodies of Delhi.
- This project aims to increase water supply to meet the city's daily demand of 1,140 million gallons (MGD).
- The purpose of the revitalization project was to create a reservoir to stop urban flooding and to avoid choked drainage.
- The government also wants to enhance the aesthetic value of the landscape by ecologically reviving it and restoring the flora and fauna of the area around it.
- In the first phase around 23-24 lakes will be artificially created – work has started for 15 lakes already.
Four lake systems at Dwarka

Pappankala STP treated effluent -> Lake 1- Polishing treated water -> Lake 2- Polishing treated water -> Pumping Station- pumps 4km Way -> Najafgarh Lake

Dwarka lake
# Artificial lakes constructed by DJB

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of lakes dug at this location</th>
<th>Rise in groundwater between 2022 to 2023 (in m)</th>
<th>Location</th>
<th>Number of lakes dug at this location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pappan Kalan</td>
<td>2</td>
<td>6</td>
<td>Rohini</td>
<td>2</td>
</tr>
<tr>
<td>Najafgarh</td>
<td>1</td>
<td>3</td>
<td>Iradatnagar</td>
<td>5</td>
</tr>
<tr>
<td>Nilothi</td>
<td>3</td>
<td>4</td>
<td>Dwarka</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td></td>
<td><strong>Timarpur</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
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**Source:** DJB

Birds spotted near Najafgarh - Spot-billed Duck, Red-naped Ibis (its breeding in nearby tall trees along Drain), Greater Cormorant, Little Egret, Cattle Egret, Painted Stork, Black-headed Ibis, Black-crowned Night Heron, Ruff, Yellow-wattled Lapwing
Nekampur lake near Hyderabad: Example of community engagement

450 years old waterbody in Ranga Reddy district

2012
BOD: 26 mg/l

2022
BOD: 8.2 mg/l
DO: 1.2 mg/l
Nekampur lake near Hyderabad

Phytoremediation

300 species of birds, reptiles, amphibians and plants
What should be done?

• Urban planners should undertake a detailed mapping of waterbodies, natural drainage and flood-prone areas in cities using remote sensing
• This should be integrated with the drainage system of the city including rivers, rivulets, ponds, lakes and other natural drainage systems
• Policymakers should relook the development plans approved by city authorities and find out whether they violate the hydrological cycle of the city or not
• Finally, there is a need for stronger laws to protect urban lakes
• A single authority for the management and restoration of waterbodies is the need of the hour
Reading list

• Centre for Science and Environment. 2011. Churning Still Water. A briefing paper on the state of urban waterbodies, conservation and management in India
• https://www.downtoearth.org.in/blog/urbanisation/if-only-cities-can-see-wetlands-45270
• https://www.downtoearth.org.in/blog/water/lessons-from-bellandur-governments-should-allocate-more-resources-to-monitor-protect-lakes-89974
• https://www.downtoearth.org.in/factsheet/mumbai-once-again-on-the-verge-of-deluge-58564
• https://www.youtube.com/watch?v=PZJB7WIfRNg
Thank you

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