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In fact: Many floods, different, yet similar

The annual flooding of the basins of rivers like the Brahmaputra is difficult to prevent. Not so the increasingly common deluges in India's biggest cities — manmade disasters only exacerbated by unusual rainfall.

Written by **Kaushik Dasgupta** | Updated: August 29, 2017 11:18 am

Earlier this month, a freak conjunction of four atmospheric systems dumped an unusual amount of rain within the span of 24 hours on Bengaluru — and because stormwater drains could not cope with the downpour that broke the daily record for August for more than 120 years, the city's low-lying areas were inundated, water entered homes in many neighbourhoods, and the authorities had to use boats to ferry stranded people.

A little more than a year ago, another downpour over a few hours, too, had paralysed life in India's IT hub. In their report, 'Urban Floods, A Case Study of Bangalore' (Journal of the National Institute of Disaster Management, April 2009), T V Ramachandra and Pradeep P Mujumdar, hydrologists at the Indian Institute of Science, Bengaluru, blamed floods in the city on the "lack of drainage upgrade works, the encroachment and filling in the floodplain on the waterways, obstruction by the sewer pipes and manholes and relevant structures, deposits of building materials and solid wastes with subsequent blockage of the system, and also flow restrictions from under-capacity road crossings (bridge and culverts)".

They wrote that "the lack of planning and enforcement has resulted in significant narrowing of the waterways and filling in of the floodplain by illegal developments", which has "subsequently caused flooding to other properties that have not previously been flooded".

The repeated flooding in Bengaluru is similar to deluges that drowned Chennai in November 2015 and Srinagar in 2014 — even though those floods caused far greater havoc and tragedy. All are the result of urban planners giving the short shrift to a fundamental principle of hydrology: natural water bodies soak up excess rainfall and use it to replenish groundwater; inter-related drainage systems created by these ponds, streams, lakes and channels then release the excess water into larger water bodies — oceans and big rivers. Our cities are increasingly getting shorn of such 'sponges'.

Bengaluru, Ramachandra and Mujumdar wrote, "is just one example of bad water management practices. Years of siltation of tanks have reduced their water storage capacity. Encroachments of nalas, lakes and other water bodies, choking of streams and stormwater drains, have taken their toll". In a separate report, 'Wetlands, Treasure of Bangalore: Abused, Polluted, Encroached and Vanishing' (December 2015), co-authored

with Sudarshan P Bhat, Asulabha K S, Sincy V, and Bharath H Aithal, Ramachandra wrote that 98% of the famous lakes of Bengaluru were encroached, rendering the city vulnerable to flooding even after normal rain. Bengaluru had more than 250 lakes about 50 years ago. Today, fewer than 10 remain in a healthy state.

floods, flooding, Bengaluru floods, guwahati floods, Chennai Srinagar floods, Delhi floods, Gurgaon floods, explained news Inundated Srinagar in 2014. Tashi Tobgyal/Express Archive

The pattern is similar elsewhere. After the Srinagar floods of 2014, a report by the New Delhi-based nonprofit sustainable development advocacy group Centre for Science and Environment (CSE) noted that in the past 100 years, more than 50% of Srinagar's lakes, ponds and wetlands have been encroached upon to construct buildings and roads.

The demands of urban development very often turn a city into a flatland that militates against its natural topographical and hydrological features. But when there is excess rainfall, the water follows the city's natural incline. Forgotten river channels sometimes

spring back to life, but with disastrous consequences. Mumbai authorities had virtually forgotten the city's Mithi river until the catastrophic flooding of July 26, 2005. What was once a flowing river had been blocked at every corner; there were encroachments and constructions on the riverbed and at the point where the river would discharge into the sea. In Delhi, a stream used to feed the Yamuna at about the same place where the busy ITO area is today. It is not without reason that the area is one of the worst waterlogged when it rains heavily.

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Bengaluru, Chennai, Mumbai, Srinagar, Delhi, Gurgaon, etc. are all examples of human intervention that have rendered a city unfit to deal with a deluge. But floods are also a natural occurrence. In Assam and north Bihar, for example, they happen almost every year. In his paper, 'Hydrology of Floods in South Asia' (November 2002), Shafiqul Islam of the University of Cincinnati showed how a combination of weather patterns and topography leads to regular flooding of the Brahmaputra. As the ice melts in the Himalayas, the water channels downstream swell. When the river enters Assam from Arunachal Pradesh, it experiences a steep fall in gradient, causing the water to hurtle down at a furious pace. During the monsoon, when the river is swollen with the precipitation from the Eastern Himalayas, its channels can't take the huge volumes gushing down at high speed. Siltation and sedimentation in the channels compound the situation.

There is, however, a human hand in such floods as well. With increasing deforestation in the Eastern Himalayas, the run-off has increased, which means as the water rushes towards the plains, it carries along more sediment. The riverbed in the plains is full of sediment, impairing the Brahmaputra's carrying capacity. Earlier, the forests would soak up a lot of the run-off — somewhat like the wetlands.

In Guwahati, the human culpability for the floods increases. The deluge here seems similar to the ones in Bengaluru, or other Indian cities. Guwahati's bowl shape anyway makes it prone to waterlogging; poor urban planning has increased its vulnerability. Wetlands that could have soaked up the rainwater or channelled them to the Brahmaputra are choked with garbage; they get clogged during heavy rain and the

water spills on to the roads. A 2014 report of the Assam State Disaster Management Authority said: “The city does not have a planned drainage system to take care of sewage, so the natural channels become all the more important. The condition of these channels are not very convincing as they are constantly covered with garbage.”

Most wetlands in Guwahati are on the verge of extinction today. Unless natural sponges are revived and restored, India’s cities will remain vulnerable to manmade flooding, especially as climate change makes rainfall patterns increasingly more erratic.