

Flood policy needs complete overhaul

India must learn from the ecological pioneers and carefully adapt the learnings to our own conditions



WATER: REFORM OR PERISH

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As the frequency and intensity of floods have increased in India, the immediate reflex is to place the blame squarely on climate change. But the alteration in the distribution and intensity of rainfall over the past three decades places an even greater burden on policy-makers to initiate long overdue reforms, through which we can avoid and mitigate the worst impacts of extreme rainfall events.

The central focus of flood policy in India has been engineering solutions. Apart from large dams, India has constructed 35,000 km of embankments parallel to rivers in their floodplains. But the problem has only got worse over time. In 2008, a breach in an upstream embankment of the Kosi river led to a thousand deaths and displacement of 3.35 million people. In north Bihar, despite continued construction of embankments, flood-prone area has increased 200 per cent since Independence, partly because embank-

ments end up obstructing natural drainages and impede natural building up of river deltas and floodplains. In the Kosi, embankments have dramatically increased the accumulated sediments in this river with already exceptionally high sediment load, whose roots lie in massive erosion of its upper catchments. The consequent super-elevated riverbed leads to breaches in embankments, worsening the flood situation, especially because settlements have been encouraged on floodplains and drainage lines.

The origins of our approach to flood management can be traced to the colonial period. A study of experiments with flood control in the delta regions of eastern India from 1803 to 1956 shows how this region was transformed from a flood-dependent agrarian regime to a flood-vulnerable landscape. The colonial administration developed the idea of flood control to secure its property regime and revenue collection strategies. Embankments designed to insulate lands from inundation were the first flood control works deployed by the British in the Odisha delta. When the iconic engineer Sir Arthur Cotton (in whose memory stands a museum in Rajahmundry) was called upon to survey the delta in 1858, he came up with one of those classic pronouncements, which (even though deeply flawed) have guided water policy in India till today: "All deltas require essentially the same treatment", which meant that their rivers needed to be controlled and regulated into an invariable and constant supply.

So, how do we overthrow this colonial legacy to forge new solutions? First,

by going back to the fundamentals of science and acknowledging the interconnectedness of different elements in the water cycle. Let's understand this with the example of the Kerala floods this month, which have occurred for the third year in succession. Like the 2013 floods in Uttarakhand, the Kerala floods clearly illustrate the importance of the health of catchment areas, which deliver our water to us. Reckless (and largely illegal) construction activity and quarrying in the eco-fragile Himalayas and Western Ghats have exponentially increased the probability of landslides. The Madhav Gadgil and Kasturirangan committees have already argued for recognising the invaluable ecosystem services provided by the Western Ghats and to design a development paradigm that recognises, values and protects them. Our insistent ignoring of this advice continues to imperil people living in these regions.

What is worse, most of Kerala's dams are concentrated in the Western Ghats. And there is a constant conflict between the demands of power generation, which requires reservoirs to be full and the imperatives of flood control, which can only happen if the dams are relatively empty before the deluge. In any case, most of our dams are meant for either irrigation or power, with flood control being a secondary objective. Instead, as secretary, earth sciences, government of India himself recently suggested, poor reservoir management has made dams an aggravating factor in floods, as happened in Surat in 2006, Chennai in 2015 and Bihar in 2016. Even within these constraints, alternative strategies for reser-



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voir management can actually be worked out. A great example is the 144 km river Chalakudy in Kerala, where the construction of as many as six large dams has completely altered the natural hydrological regime of the river. But a group of engineers and social scientists have designed an alternative sustainable reservoir operations management strategy, which was endorsed by all six riparian MLAs, after an intense period of social mobilisation. Such plans need to be carefully studied and replicated across the country.

What has further aggravated the problem of floods, especially in urban areas, is the destruction of natural pathways of water through the city towards the river or the sea. Once we block these, where will flood water go, but into our homes and workplaces? Hyderabad in 2000, Ahmedabad in 2001, Delhi in 2003, 2009 and 2010, Chennai in 2004, 2015 and 2017, Mumbai in 2005 and 2017, Kolkata in

2007, Jamshedpur in 2008, Guwahati, Kochi and Srinagar in 2014, Thiruvananthapuram in 2017... it is a recurrent, endless saga of urban floods. But even as we recount them, we forget that Chennai had more than 600 water bodies in the 1980s. Today not even a third survive. Hyderabad has lost 3,245 hectares of wetlands in the last 15 years. Bengaluru had 262 lakes in the 1960s. Today hardly 10 have any water. The Bellandur lake even caught fire in 2015, 2017 and 2018 due to the chemically active sludge dumped into it. Alleppey, the "Venice of the East" is struggling to clean and desilt its beautiful lake system, which protected it from floods in the past. We have criminally neglected and encroached upon these water bodies that act as sponges for excess water and whose natural drainages provided a safe exit for flood waters.

Copenhagen, London, New Orleans, Chicago, Rotterdam, Melbourne and New York are all acknowledging that the increasingly frequent cloudbursts of the 21st century demand a recognition that the economy is but a small element within the larger ecosystem. Their planning reflects exciting "building with nature" and "room-for-the-river" perspectives, with much greater emphasis on low-cost blue-green infrastructure that connects urban hydrological functions (blue) with vegetation systems (green). India can do well to learn from these ecological pioneers by carefully adapting learnings to our own conditions.

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