Source : www.thehindu.com Date : 2023-02-14

HILL OR CITY, URBAN PLANNING CANNOT BE AN AFTERTHOUGHT

Relevant for: Indian Polity | Topic: Executive: Structure, Organization & Functioning ; Ministries and Departments of the Government

February 14, 2023 12:08 am | Updated 10:25 am IST

At Joshimath, Uttarakhand | Photo Credit: V.V. KRISHNAN

On December 24, 2009, a tunnel boring machine in Joshimath, Uttarakhand, hit an aquifer about three kilometres from Selang village. This resulted in the loss of nearly 800 litres of water per second (enough to sustain the needs of nearly 30 lakh people per day). Soon after, groundwater sources began drying up even as the water flow reduced but never stopped. Meanwhile, Joshimath has no system to manage wastewater. Instead, the large-scale use of the soak-pit mechanism could exacerbate land sinking. Ongoing infrastructure projects (the Tapovan Vishnugad dam and the Helang-Marwari bypass road) may also worsen the situation.

Land subsidence incidents in hilly urban India are becoming increasingly common —an estimated 12.6% of India's land area is prone to landslides, especially in Sikkim, West Bengal and Uttarakhand. Urban policy is making this worse, according to the National Institute of Disaster Management (and highlighted in the National Landslide Risk Management Strategy, September 2019). Construction in such a landscape is often driven by building bye-laws that ignore local geological and environmental factors. Consequently, land use planning in India's Himalayan towns and the Western Ghats is often ill-conceived, adding to slope instability. As a result, landslide vulnerability has risen, made worse by tunnelling construction that is weakening rock formations.

Acquiring credible data is the first step toward enhancing urban resilience with regard to land subsidence. The overall landslide risk needs to be mapped at the granular level. The Geological Survey of India has conducted a national mapping exercise (1:50,000 scale, with each centimetre denoting approximately 0.5 km). Urban policymakers need to take this further, with additional detail and localisation (1:1,000 scale). Areas with high landslide risk should not be allowed to expand large infrastructure; there must be a push to reduce human interventions and adhere to carrying capacity. Aizawl, Mizoram, is in 'Seismic Zone V', and built on very steep slopes. An earthquake with a magnitude greater than 7 on the Richter scale would easily trigger over 1,000 landslides and cause large-scale damage to buildings. But the city has developed a landslide action plan (with a push to reach 1:500 scale), with updated regulations to guide construction activities in hazardous zones. The city's landslide policy committee is cross-disciplinary in nature, seeking inputs from civic society and university students, with a push to continually update risk zones.

Further, any site development in hazardous zones needs assessment by a geologist (with respect to soil suitability and slope stability) and an evaluation of its potential impact on buildings that are nearby. It may need corrective measures (retention walls), with steps to prohibit construction in hazardous areas. In Gangtok, Sikkim, the Amrita Vishwa Vidyapeetham has helped set up a real-time landslide monitoring and early warning system, with sensors assessing the impact of rainfall infiltration, water movement and slope instability.

Flood risk is the second issue. In August 2019, Palava City (Phase I and II) in Dombivli, Maharashtra experienced heavy flooding, leaving residents stranded. Seasonal rain is now increasing in intensity, and the reason for the flooding soon became evident — the township, spread over 4,500 acres, was built on the flood plains of the Mothali river. When planned townships are approved, with a distinct lack of concern for natural hazards, such incidents are bound to occur. There are more examples. Floods in Panjim, Goa, in July 2021, led to local rivers swelling and homes being flooded, leaving urban settlements along the Mandovi affected. Again, urban planning was the issue; the city, built on marshlands, was once home to mangroves and fertile fields, which helped bolster its flood resilience. In Delhi, an estimated 9,350 households live in the Yamuna floodplains, while the UN Intergovernmental Panel on Climate Change report of March 2022 has highlighted the risk Kolkata faces due to a rise in sea levels. The combination of poor urban planning and climate change will mean that many of India’s cities could face devastating flooding.

Flooding in Bengaluru, in 2022 | Photo Credit: K. MURALI KUMAR

Flood-proofing India’s cities will require multiple measures: urban planners will have to step back from filling up water bodies, canals and drains and focus, instead, on enhancing sewerage and stormwater drain networks. Existing sewerage networks need to be reworked and expanded to enable wastewater drainage in low-lying urban geographies. Rivers that overflow need to be desilted regularly along with a push for coastal walls in areas at risk from sea rise. Greater spending on flood-resilient architecture (river embankments, flood shelters in coastal areas and flood warning systems) is necessary. Protecting “blue infra” areas, i.e., places that act as natural sponges for absorbing surface runoff, allowing groundwater to be recharged, is a must. As rainfall patterns and intensity change, urban authorities will need to invest in simulation capacity to determine flooding hotspots and flood risk maps.

Urban India does not have to embrace such risks. Instead, cities need to incorporate environmental planning and enhance natural open spaces. Urban master plans need to consider the impact of climate change and extreme weather; Bengaluru needs to think of 125 mm per hour peak rainfall in the future, as against the current 75 mm. Urban authorities in India should assess and update disaster risk and preparedness planning. Early warning systems will also be critical. Finally, each city needs to have a disaster management framework in place, with large arterial roads that allow people and goods to move freely. India’s urban journey is not limited to an election cycle. It must plan for a multi-generational process.

Feroze Varun Gandhi is a three-time Member of Parliament from the Pilibhit Lok Sabha constituency in Uttar Pradesh and the author of the new book, ‘The Indian Metropolis: Deconstructing India’s Urban Spaces’

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