

Land use conversion and climate change can make a deadly combination for Mumbai

The coastal landscape of Mumbai has changed drastically in the last few years | Photo Credit:

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For the second time in a little more than a decade, rain and floods brought Mumbai, India's commercial capital, to a grinding halt. The city recorded nearly 300 mm of rain on August 29, one of the heaviest spells in the city's history. It was much lower than the all time single-day record of 944 mm of July 2005, but it was enough to bring the city to its knees.

The media reported on the impact on citizens, the failure of the local administration to first anticipate and then deal with the situation. While this remained focused primarily on the causes of flooding, there was another series of reports on larger phenomenon at play: Global warming and changing land use in the city. This makes a deadly combination indeed.

The coastal landscape of Mumbai has changed drastically in the last few years — satellite imagery following the August deluge shows, for instance, how mangrove forests in areas like Thane, Malad, and the Manori creek, have been lost or encroached upon. The new airport that was approved in Navi Mumbai a few years ago will destroy nearly 160 hectares of mangroves. The initial proposals by the Mumbai Metropolitan Region Development Authority had suggested the reclamation of more than 20 sq.km. of the city's salt pans for housing and other projects. The desire for more land is clearly jettisoning the security of the city and this is only expected to grow more pronounced as weather patterns become more extreme and also more uncertain with climate change.

Capacity to cope

There are two threads of discussion that are relevant here. On the positive side is the realisation, at least to an extent, of the importance of ecosystems like the mangrove. This is reflected in the creation in Maharashtra of a mangrove cell to protect and regenerate mangroves. Mumbai has some very good patches of mangroves, two of which (in Vikhroli and Airoli in Navi Mumbai) were included in a list of 12 important mangrove systems in India recently released by the Mangrove Society of India. While protection of the mangroves is unlikely to completely prevent the kind of events Mumbai has seen recently, the move will certainly help ensure a better capacity to cope. A 2009 study by scientists at the University of Delhi and Duke University in the United States showed, for instance, that villages with wider mangrove belts suffered relatively lesser damage during the 1999 'super cyclone' that ravaged the Odisha coast and killed an estimated 10,000 people.

A study published in May 2017 in the journal *Hydrobiologia*, pointed out that in the U.S., wetland coastal protection services provide an estimated \$23.2 billion per year against economic losses as well as deaths associated with major storm events.

Huge challenges

The bigger challenge in India comes however from the overarching thrust given to industrial expansion and infrastructure development.

This is starkly visible in the NITI Aayog's recently-released 'Three year action agenda 2017-18 to 2019-20'. While the action agenda for coastal regions does list issues surrounding coastal zone management and regions vulnerable to cyclones, flooding, earthquakes and tsunamis, these are included only as broad generalities. The major thrust, clearly, is on exploiting the land and the

resources along the coasts for aggressive economic growth, suggesting as it does port development as part of the Sagarmala programme, easing of sea-river movement, a massive thrust to tourism development, creation of a 2500 km long East Coast Economic corridor running from Visakhapatnam to Chennai, and the creation of 14 Coastal Employment zones based on the Chinese model of Special Economic Zones.

Conservation and protection are clearly not a priority — and this is a matter of serious concern, not just for Mumbai but for regions all along India's coastline. The NITI Aayog report itself notes that nearly 250 million people in the country live within 50 km of the coastline. And no amount of infrastructure development or economic growth will ensure their protection as the case of Mumbai has shown not once, but twice in little more than a decade.

The writer researches issues at the intersection of environment, science, society, and technology.

Jaggi Vasudev's Rally for Rivers claims they will, but this is not based on the most nuanced science

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