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BKC, Thane, Antop Hill at risk of extreme flooding, says study

Vaishnavi Chandrashekhar | TNN | Updated: Jul 24, 2018, 05:57 IST



MMRDA ground at BKC

MUMBAI: Bandra-Kurla Complex (BKC), Thane, Bhiwandi and Antop Hill are among the areas most at risk from extreme floods, according to RMSI, a leading risk management consultancy that works with major insurers and government agencies.

The assessment shows, expectedly, that the areas around the rivers and creeks are at high risk from extreme flooding. Kalina, Sahar Road, BKC and Dharavi all lie along the Mithi river and were inundated during the 2005 Mumbai deluge when 944mm of rain descended on the city in just one day.

TimesView

Thirteen years after the 26/7 deluge, authorities have taken some good measures: opened pumping stations, started a full-fledged disaster management cell, and improved drain networks in traditionally vulnerable areas. But much remains to be done. For one, the city needs a comprehensive and continually updated flood risk assessment to keep up with new flooding areas. As importantly, authorities need to start marking flood risk zones on their development plans and regulating construction within those areas. The government needs to wake up to the fact that climate change is increasing the risk of extreme rainfall events and large-scale measures need to be taken if Mumbai is not to keep drowning.

GLOBALLY, CITY 8TH ON STORM RISK LIST

- Mumbai ranks 8th among cities most exposed to storm risk across the world
- There has been a three-fold increase in extreme rainfall events between 1950 and 2015 across central India, including Mumbai
- Extreme rainfall event was defined in an IIT study as over 150mm in a day
- Probability of an extreme rainfall event like 26/7 could double by 2080s in a climate change scenario
- A 1-in-100 year flood is not a flood that occurs once in a hundred years but one that has a 1% chance of happening in any year

26-7-2005 MUMBAI

But the risk model also identifies Thane, Bhiwandi, Mumbra and Kalwa, along the Ulhas River and Thane Creek, as high flood-risk areas.

HUMAN FACTORS TO BLAME FOR INCREASING RISKS, SAYS STUDY

Areas most at risk from extreme floods

CITIES

- Ahmedabad
- Bombay
- Chennai
- Bengaluru
- Kolkata
- Delhi
- Hyderabad
- Kochi
- Bhubaneswar
- Allahabad

Mumbai region

- Kalina
- Antop Hill
- Dharavi
- Bhandup/Kanjur
- Marg East
- Shivaji Nagar
- Mulund East
- Bandra East/BKC
- Chembur
- Bhiwandi
- Thane
- Mumbra
- Divia
- Kalwa
- Sarawali
- Sahar Road/Airport

1% PROBABILITY OF A DELUGE EVERY YEAR

A 1-in-100 year flood is not a flood that occurs once in a hundred years but one that has a 1% chance of happening in any year

Similarly, a one-in-ten-year event refers to an event that might have a 10% chance of occurring in any year

The 26/7 event in Mumbai, when 944mm rain came down on the city in 24 hours, is considered a 1-in-150 to 200 year event

Legend: 25-1 mtr high flood, 2-3 mtrs, 4-5-5.99 mtr, 6mtrs and above

Source: RMSI

Mumbai came to a halt on July 26, 2005 as it received 944mm of rain in just one day. Recent IIT Bombay studies on the Mithi and Oshiwara river basins have shown significant increases in flood hazard due to construction on their flood plains

These areas are most at risk from extreme floods because they are low-lying and see frequent flooding but also because they are developed areas vulnerable to damage and loss

Note: Risk assessment of these areas is based on RMSI's flood risk model which uses a combination of river flow data, rainfall data, flood protection infrastructure information obtained from various flood agencies, land use/land cover data, SDO soil map of India, and digital elevation data from multiple sources

Among Indian cities most at risk are Ahmedabad, Mumbai, Chennai, Bengaluru, Kolkata, Delhi, Hyderabad, Kochi, Bhubaneswar and Allahabad.

Why are inland areas such as BKC, Thane, Bhiwandi and Antop Hill at such high risk from from extreme floods? Pushendra Johari, head of risk and insurance at RMSI, notes that low-lying areas in the island city are more influenced by high tide events. "Water in these areas drain out into the sea quickly," he said. "But in areas farther inland, the water won't go anywhere for a long time."

Moreover, he notes, a lot of new construction and business is coming up in Thane and Bhiwandi. So exposure of people and assets to natural hazards in those areas has risen. "Risk is a combination of hazard and exposure," he noted.

Vasai-Virar is not quite as high risk in this assessment. The recent floods there were due to short-term conditions such as clogged drains combined with high rainfall, said RMSI. The RMSI assessment deals with extreme flood hazard—under conditions of heavy rainfall—and not local or chronic water-logging. This longer-term flood risk is based on a model that uses historical rainfall and water-flow data with information on topography, land use, and infrastructure.

The government has not yet undertaken a comprehensive flood risk assessment for the region. But such a study is needed, said V K Phatak, former chief planner at the Mumbai Metropolitan Region Development Authority. "In fact, it should be an ongoing exercise given changing the rainfall patterns," he said.

Globally, Mumbai ranks eighth among cities exposed to storm risks, according to a 2014 report by global reinsurer Swiss Re. And climate change is thought to be increasing those risks.

There was a three-fold increase in extreme rainfall events between 1950-2015 across central India, including Mumbai, according to a study by scientists from IIT Bombay and the Indian Institute of Tropical Meteorology. Another study by RMSI found that the probability of an extreme rainfall event like 26/7 could double by the 2080s in a climate change scenario.

Still, RMSI attributes much of the rise in urban floods over the last 15 years to human factors such as inadequate drains and unplanned urbanization, including destruction of wetlands and waterbodies. Indeed, recent IIT Bombay studies on the Mithi and Oshiwara river basins have shown significant increases in flood hazard due to construction on their flood plains.

"We have not taken flood risk assessment seriously enough," said Rakesh Kumar, head of the National Environmental Engineering Research Institute (NEERI). "All our actions are based on current data. We put a pump in Hindmata because it gets flooded. But we need macro measures as well that are integrated into the planning process."

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TIMES VIEW: Thirteen years after the 26/7 deluge, authorities have taken some good measures: opened pumping stations, started a full-fledged disaster management cell, and improved drain networks in traditionally vulnerable areas. But much remains to be done. For one, the city needs a comprehensive and continually updated flood risk assessment to keep up with new flooding areas. As importantly, authorities need to start marking flood risk zones on their development plans and regulating construction within those areas. The government needs to wake up to the fact that climate change is increasing the risk of extreme rainfall events and large-scale measures need to be taken if Mumbai is not to keep drowning.