

THE TIMES OF INDIA

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Climate financing: US approves bill to reduce Wagon

US lawmakers have approved a bill to reduce the amount of climate financing that the US provides to developing countries. The bill, which is part of a larger package of climate legislation, would reduce the amount of US aid to developing countries from \$50 billion to \$30 billion over the next five years.

Rafale: COP to serve privilege notice to Modi?

The Indian government is expected to receive a notice from the Committee of Parliament on External Affairs regarding the purchase of Rafale fighter jets from France. The notice is expected to be issued in the next few days.

Attacked, cop shoots daocit

A police officer in Mumbai was shot at by a group of men who were protesting against the government's decision to allow the entry of foreign workers into the country.

Transport stir: Potatoes up ₹4

The price of potatoes in Mumbai has increased by ₹4 per quintal due to a shortage of supply in the market.

Idea, Voda pay DoT ₹7,300cr

The Department of Telecommunications (DoT) has received ₹7,300 crore from Idea and Voda for the spectrum auction.

Umpire selection: Email alleges bias

An email was sent to the Indian Cricket Control Board (ICCB) alleging bias in the selection of umpires for the upcoming cricket matches.

Indranil's son depose in case

Indranil's son has been called to depose in court regarding the case involving the late actor's estate.

US CO files 135% more patents in India than do all top desi labs

HOW THEY STACK UP

Company	Patents Filed	Patents Granted
US CO	135%	135%
DRB	28	176
DCM	28	176
DRB	28	176
DCM	28	176
DRB	28	176
DCM	28	176
DRB	28	176
DCM	28	176

MLA's with us, boasted lynch mob: Victim's friend to cops

BJP Legislator Alleges Plot To Malign Him

Chandrashekhar



Mumbai: This is a shocking revelation. The BJP legislator, Chandrashekhar, has alleged that a group of people, including some MLAs, were involved in a plot to malign him. He claims that they were trying to frame him for a crime that he did not commit.

Iran's now India's second biggest oil supplier, govt in fix

Rahul

Iran has become India's second largest oil supplier, and the government is in a fix to deal with the situation. The government is trying to diversify its oil sources to reduce its dependence on Iran.

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

Vaishnavi Chandrashekhar

A study by an IIT has found that BKC, Thane, and Antop Hill are among the areas most at risk of extreme flooding in Mumbai. The study also found that there has been a three-fold increase in extreme rainfall events between 1950 and 2015 across central India.

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

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. A leading risk management consultancy that works with major insurers and government agencies.



26-7-2005 MUMBAI

Office hubs vulnerable, P 3

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

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.

But the risk model also identifies Thane, Bhiwandi, Mulmabra and Kalva, along the Ul-

has River and Thane Creek, as high flood-risk areas. Among Indian cities most at risk are Ahmedabad, Mumbai, Chennai, Bengaluru,

Kolkata, Delhi, Hyderabad, Kochi, Bhubaneswar and Allahabad.

Office hubs vulnerable, P 3

PIO couple sells IT firm, rakes in \$2bn

Mumbai: The couple has sold their IT firm for \$2 billion. The couple, who were in the IT industry for over 20 years, have decided to exit the industry and sell their firm.

wood Narayana

STARTED WITH...

16

wood Narayana

STARTED WITH...

16

Fast-growing office hubs most prone to flooding

Many Biz Centres Located Inland, Water Drains Slowly

Vaishnavi Chandrashekhara

Mumbai: Why are inland areas such as BKC, Thane, Bhiwandi and Antop Hill at such high risk from from extreme floods? Pushpendra 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

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.

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 chro-

nic 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."

HUMAN FACTORS TO BLAME FOR INCREASING RISKS, SAYS STUDY

Areas most at risk from extreme floods

CITIES
Ahmedabad | Mumbai | Chennai | Bengaluru | Kolkata | Hyderabad | Kochi | Bhubaneswar | Allahabad

Mumbai region
Kalina | Antop Hill | Dharavi | Bhandup/Kanjur Marg East | Shivaji Nagar | Mulund East | Bandra East/BKC | Chembur | Bhiwandi | Thane | Mumbar/Divia | Kalwa | Sarawali | Sahar Road/Airport

1% PROBABILITY OF A DELUGE EVERY YEAR

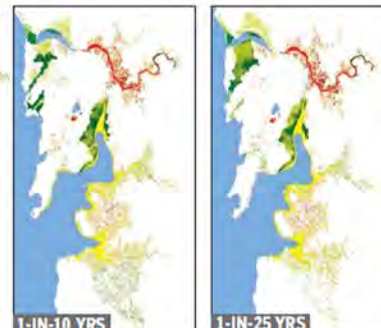
> A 1-in-100 year flood is not a flood that occurs once in a hundred years but one that has a 1% chance of happening in any year

> 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



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, FAO soil map of India, and digital elevation data from multiple sources

'Risk of 26/7-like deluge could double in future'

RMSI is a global GIS consultant focused on assessing natural hazard risks, including flood, earthquake, and cyclones. It provides such assessments to insurers—nine general insurance companies in India—and also works with government and international agencies. Pushpendra Johari, the head of Risk & Insurance at RMSI, has over twenty years of experience including with the US Federal Emergency Management Agency (FEMA). He spoke to Vaishnavi Chandrashekhara:

Q: What is a flood risk assessment?
A: A flood risk assessment tells us that if a once-in-100-year rainfall event or a once-in-10 year event happens, then this is the kind of flooding we may see. We have to distinguish between water-

logging, which is a localized and perennial problem, and flood risk. Waterlogging happens when there is high tide or drains aren't working well. It can happen even when there is not a lot of rain if the drains are clogged with, for example, sand from construction in an area.

Q: Do your models show an increase in flood risks?
A: Yes. The amount of rainfall is not necessarily changing but the amount in a given period of time is. When I was young, we used to see a steady amount of rain through the entire week. Now we have a lot of rain in a short burst. When it pours for a few hours, there's clogging. When it pours heavily for a few days, we are likely to have flooding.

Q: Do you integrate climate change into the model?
A: We keep evaluating how the model has performed and if there is change in rainfall patterns, we change the model. Another way is to look at climate change projections but there are some 18 [climate change] models each with different results. So which one do you believe? After 2005, we did do an analysis for OECD, where we were asked to remodel the 2005 Mumbai flood event for a climate change scenario. We found that the chances of such an event could double in the future. This indicates climate change is increasing extreme events.

Q: How often do you update your model?
A: Whenever there is a new flood, we test our models. In Chennai, for ex-

ample, we had teams on the ground after the 2015 floods, checking the high water marks and comparing it to our model. This year, we updated our flood risk because some pin-codes are changing, either there is more construction in the area or more rainfall.

Q: Where do you see a lot of change?
A: In Mumbai, there is not a lot of change. High risk areas continue to be high. We hear there are some mitigating measures being carried out in Bandra-Kurla Complex and we will see if that has a mitigating impact in the future. Chennai has seen a huge change. Twenty to thirty years back, it had 100-odd waterbodies that acted as sinks for excess water, now there are 29-30 waterbodies left. And that is what is changing that city's flood risk.

Mom of rescued newborn traced to Bengaluru

George Mendonca

Navi Mumbai: A police team that rescued a newborn boy from four traffickers has traced his mother to Bengaluru and found her begging with her two children outside a dargah. After arresting the traffickers, police recovered documents of the delivery at a Bengaluru hospital and traced the mother.

A source said, "The woman, in her early 20s, had delivered on July 13. Nagina Khan, a trafficker, approached her, saying her physically challenged brother was unable to become a father and would give the baby a good life." On July 20, Khan brought the newborn to Mumbai.

Meanwhile in Mumbai, her accomplice had assured to arrange a baby boy after Vishal Dubey, a decoy customer, sought a baby and agreed to buy a boy for Rs 3 lakh, as demanded by the gang.

Orkut founder to feature at Malhar 2018

Urvasli Valecha

Mumbai: The St Xavier's Annual Fest, Malhar 2018, will be held from August 15-17.

"This is a landmark year as it is the 40th year of Malhar and 150th year of our college," said Nivedha Kannan from the public relations team of Malhar 2018. She added, "Our theme is The Time Turner. It conforms with the legacy of our college, which is in its 150th year and how with time we have evolved." The keynote speaker for Conclave 18 will be Nadir Godrej, MD of Godrej Industries, an alumnus of Xavier's. Orkut Buyu, founder of Orkut, will be the international speaker for the event.

Kannan said that the fest also has a line-up of events to promote various social causes.

DRT relocation delay: Is FinMin asleep, asks HC

Mumbai: The Bombay high court on Monday asked Centre's counsel Shyam Mehta to inform it