



# Cyclone Tauktae, Yaas: How cyclone prediction techniques work, why they are important and how to prepare for storms

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To understand this, Financial Express Online interacted with geospatial company RMSI's Senior VP for Sustainability, Pushpendra Johari.



He also explained what has changed now that cyclones forming on the Arabian Sea are coming towards India.

**Cyclone Tauktae, Cyclone Yaas:** Recently, the western coast of India witnessed Cyclone Tauktae and its devastating impact. The cyclone turned into an extremely severe cyclonic storm in the hours leading up to the landfall in Gujarat, and while on its way to make the landfall, it passed by Mumbai and wreaked havoc there as well. The phenomenon was also surprising to India because the cyclones forming over Arabian Sea do not usually impact the country and rather move towards the west, but this is the second cyclone the country has seen on the western coast in the past two years. It is even rarer for the first cyclone of the year to form over the Arabian Sea and make landfall in India. But, the country has barely carried out complete relief and rescue missions on the western coast and now, the eastern coast is also about to face a cyclonic storm in the coming days.

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It is, therefore, important to predict cyclones well in time so that the authorities as well as the people have enough time to prepare for the calamity. India Meteorological Department (IMD) gives warnings about upcoming cyclonic storms so as to help people prepare. But how do these techniques work? And what should people do at their end to minimise the impact of such cyclones? To understand this, Financial Express Online interacted with geospatial company RMSI's Senior VP for Sustainability, Pushpendra Johari.

Talking about the prediction techniques used in this aspect, Johari said, "Cyclones are a hazard that impact through winds, surge and floods induced by heavy rains. Thus, there are two aspects in cyclone prediction. One is prediction of the cyclone track and landfall location. This is done using numerical weather prediction models that have achieved very good accuracies now. The second is prediction of the wind, surge and rainfall induced floods associated with the cyclone. Here wind and surge estimation is done using a combination of empirical and numerical models and flood estimation is done by applying hydrological and hydraulic models. Both have been applied to great success."

"The track forecasts start coming about 3 days in advance but they are more accurate within 2 days of the event landfall. Thereafter, track advisories are done every 3 to 6 hours," he said when asked about the time window that authorities get with the help of these predictions. "Advance forecasts for an incoming cyclone can help coastal authorities in planning and undertaking emergency measures, and insurance companies to prepare for potential payouts," he added.

He also shared ways in which the damaging impact of cyclones can be minimised. "The impact of any hazard could be categorized into life and property. A Decision Support System for such emergencies can inform authorities to issue early forecasts on the upcoming cyclone and can undertake immediate measures to safeguard the people. In addition, this could also inform some of the measures that could be taken to safeguard the assets. For example, in the Tauktae cyclones, the barges could have been moved closer to the coast based on a forecast suggesting that those are at risk of detaching. We are currently implementing these kinds of solutions for various government agencies as well as the public sector," he said.

Johari further added, "Similarly, there is a strong need to improve the performance of our electric power and communication network. For example, use of Tendons can reduce vibration in Towers, Masts and Stacks thereby reducing the risk, horizontal and vertical stiffeners as well as active and passive dampers connected to the hangers reduce vibrations. There is a strong initiative through CDRI for this."

However, most of these measures need to be taken at governmental level or by companies. What can be done by people at their own level to prepare for the cyclone as well as its aftermath? Johari gave a few examples of what can be done by people:

- Gather emergency supplies for your home and car and stay indoors.
- If the advisory directs to evacuate, then evacuate to a government shelter or any safe area of your choice
- Park your car away from trees
- Avoid moving outside or driving through flooded areas and standing water
- Bolt doors and windows with cross wooden plants or bars from inside, so they get additional support to bear the wind load
- If the roof is made of tiles, try to cover those with a wire mesh strongly bound to the sides so that it doesn't fly away
- Place a generator and any gasoline-powered engine outside at least 20 feet from any window, door, or vent.

He also explained what has changed now that cyclones forming on the Arabian Sea are coming towards India. "The recent cyclone, Tauktae, is the most devastating cyclone experienced in the west coast of India. It's a very unique cyclone that ran parallel to our western coastline impacting all the States in the western coast, especially Gujarat and Diu. If we go back to history, it's very rare that the first cyclone of the season happens in the Arabian Sea. The frequency has now been increasing as is evident in the last five years. This was not happening earlier. Recent climate change studies have highlighted the rising sea surface temperature in the Arabian Sea. This is increasing the cyclone frequency in these regions. We should improve our preparedness even further to deal with more such events in future," he shared.

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