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THE Extremely Severe Cyclonic Storm *Fani* hit Odisha on 3 May 2019 at a wind speed of 175 kmph. It caused extensive damage to the state of Odisha leaving behind a trail of destruction, damaging seaside hotels, snapping electric wires, uprooting electric poles, trees and mobile towers. A large number of houses were damaged and 64 lives were lost.

The impact of the cyclone was felt in 14 districts, the pilgrim town of Puri being the worst affected. The administration faced the problems of green debris, no electricity, and water scarcity. The waters of the Lake Chilika became saline.

Yet, the Government of Odisha deserves credit for its preparation to combat Fani. Evacuation of people from the coastal areas reduced casualties. But all this could not have been possible without the accurate forecasts of the India Meteorological Department (IMD), which deserves to be commended.

*Fani* originated from a tropical depression that formed west of Sumatra in the Indian Ocean on 26 April rapidly intensifying into an Extremely Severe Cyclonic Storm and reaching the peak intensity on 2 May. The IMD began tracking the depression near Sumatra on 26 April. Later that day, the Joint Typhoon Warning Center (JTWC) issued a Tropical Cyclone Formation Alert on the system.

Later, the storm slowly coalesced while moving northward and was upgraded to a deep depression on 27 April. At the same time, the JTWC began warning on the system. Soon, the IMD upgraded the system to a cyclonic storm and gave it the name Fani.

IMD informed that the cyclone would transform into an extremely severe cyclone or category IV cyclone and that it would make landfall in the middle of Odisha coast on South Puri on 3 May. It may be noted that cyclonic storms are five times more frequent in the Bay of Bengal than in the Arabian Sea. The above forecasts were very accurate and Cyclone Fani behaved as per the forecast which is a tribute to the forecasting techniques of the IMD.

Coastal hazard management involves developing an effective and efficient system of monitoring the movement of cyclones through satellites, radar and aircraft and giving advance warning to enable the people to evacuate threatened areas. A map of Hazard Prone Belts has already been prepared.

The Geosynchronous INSAT-1B Satellite can continuously monitor cyclones. The S-Band Radar is used for monitoring and tracking of cyclones. The India Meteorological Department (IMD) tracked the storm and issued numerous yellow warnings for much of the south-eastern part of India when the cyclone started to intensify.

Prior to Fani’s landfall, the Odisha Disaster Rapid Action Force (ODRAF) and fire stations, and the National Disaster Response Force (NDRF) moved at least a million people from Fani’s projected path onto higher ground and into cyclone shelters, which reduced the resultant death toll. Last year, before Cyclone Titli, the state had evacuated just over a fifth of that. The authorities deployed around a thousand emergency workers and 43,000 volunteers in these efforts. It sent out 2.6 million text messages to warn of the storm in addition to using television, sirens and public-address systems to communicate the message.
About 7,000 kitchens were operated to feed evacuees in 9,000 storm shelters. The Indian Navy readied naval ships and aircraft at Arakkonam and Visakhapatnam air bases to prepare for the storm’s aftermath and aid in reconnaissance, rescue and relief operations. The Odisha government arranged “300 powerboats, two helicopters and many chain saws, to cut downed trees”.

The evacuation began around 10 am on May 2 and continued till the early hours of May 3; temporary kitchens were set up in the shelters. A total of 85,000 people were moved to cyclone shelters. More than 135 temporary cyclone shelters were opened in the city to accommodate needy people. The shelters were equipped with basic essentials including medicines and food. All government schools in the Bhubaneswar Municipal Corporation (BMC) area were utilized as shelters to accommodate more people if needed. Children, women and elderly were given priority in the shelters.

The Bhubaneswar Municipal Corporation (BMC) had requested private advertisers to remove hoardings and other display boards to prevent passersby from getting hurt. Even a 60 kmph strong wind could blow them away.

Once the cyclone started waning, the NDRF, ODRAF and firemen got to work, clearing roads of trees and other debris. But for at least ten days after Fani, most of Puri, Bhubaneswar and Cuttack had no power, as the cyclone had severely damaged electric poles. People faced acute shortage of water and struggled to find ATMs with cash.

As mobile connectivity was patchy, they could not take to social media and WhatsApp to let the outside world know of their plight. Those in Bhubaneswar who could afford to check into hotels, which relied on diesel gensets, did so.

The scars left by past cyclones have made Odisha take disaster management very seriously. Cyclones Phailin, Titli and Fani have shown Odisha having a high level of preparedness.

**Damages - Looking Ahead**

Fani caused grave damage to Odisha’s green cover as nearly 22 lakh trees were destroyed in 11 coastal districts. More than 7.2 lakh trees were uprooted or damaged in Bhubaneswar. In Puri, where Fani made Landfall about 49,000 trees were uprooted. Around 17,000 trees were uprooted in Cuttack.

Fani completely tore apart the green cover of the Balukhand Wildlife Sanctuary that was once a visual delight for many while travelling along the Puri Konark Marine Drive and is home to around 4000 spotted deer and other wild animals. Asia’s biggest brackish water lake, Chilika became drastically saline due to increased inflow of seawater, affecting marine life.

In Bhubaneswar, many roads were demudded of their tree cover. With the lush green canopy completely lost, the city’s pollution and mercury levels rose. Decorative and exotic species which had been planted in the city were lost.

The trees present on the roadside such as *Alstonia scholaris* (Chatim/Chahatiyan) withstood Fani. This shade giving tree is so hardy that it can reportedly withstand winds of speed up to 300 kmph. It can grow fast without much care. Neem, Jamun and Banyan are other disaster resistance trees that withstood the onslaught of Fani. Sunari, Radhachuda and Krishnachuda trees are fragile and could not withstand the heavy wind of Fani.

Adopting modifications in the construction design that would strengthen structures to withstand the onslaught of fierce winds, surge waves and floods, and developing a massive wall of multistoried forests all along the vulnerable coast are two very important measures that need attention.

Mangrove forests are being developed along Odisha’s coast particularly off Ganjam, to minimise the destruction caused by cyclones. In 1999, when the Super Cyclone hit the state, mangrove forests along the Kendrapada Coast significantly reduced the number of deaths there. The mangroves also reduced livestock loss.

During cyclone Fani, the mangrove trees in the Balukhand Sanctuary in Konark near Puri were able to withstand the fierce wind. Mangroves are salt tolerant trees, also called Halophytes. About 70,000 wind-resistant trees/saplings 10-12 feet tall are also proposed to be planted in and around Bhubaneswar and within Nandankanan Zoo.

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