

FIERCE CYCLONES COULD BE LINKED TO CLIMATE CHANGE

Two intense cyclones have hit India in almost a year. That is totally consistent with what scientists have been warning will be a consequence of climate change



Cyclone Phailin, which struck Odisha last year, was the second strongest storm ever to hit India's east coast. (Image by Save The Children)

Scientists say that while it is still too early to conclude the recent cyclones that struck India's east coast are due to global warming, they could be a pointer towards things to come.

On October 12, tropical cyclone Hudhud pounded Visakhapatnam on India's east coast, leaving at least 26 dead, wrecking power and telecommunication lines, uprooting trees and shattering the airport terminal roof. The cyclone was strong enough to cross 2,000 kilometres over land and cause an avalanche in the Himalayas, leading to at least 30 more deaths.

In an eerie coincidence, Cyclone Hudhud hit the coast exactly a year and a day after another monster storm, Cyclone Phailin, struck the Odisha coast north of Visakhapatnam. Meteorologists said as per their records, Phailin was the second strongest storm to hit India's east coast.

"Based on these two events (Phailin and Hudhud), it is not possible to talk about a trend. However, the two very intense tropical cyclones in the past two years is consistent with likely occurrence of more intense tropical cyclones in a warming world," Bhupendra Nath Goswami, former director of Indian Institute of Tropical Meteorology (IITM), Pune, told indiaclimatedialogue.net.

“I think we should wait a few more years to get enough statistics before we conclude that global warming is leading to intense cyclones. If theory is right, the recent intense storms such Phailin and Hudhud could very well be the indicators of what holds for the future,” said Govindasamy Bala, professor, Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore.

Bala said that the Intergovernmental Panel on Climate Change (IPCC)'s fifth assessment report projection for the north Indian Ocean basin has “large uncertainty” about the frequency and intensity of cyclones under global warming. “But theories on tropical cyclones do predict intense storms with climate change,” he added.

India uses weather models to predict and track and intensity of cyclones like Hudhud but the country does not yet have a climate model that can project the 21st century's climate. Therefore, there are no projections from India on tropical cyclones for 2050 and 2100, Bala observed.

Cyclones are not new to Visakhapatnam and other areas of India's east coast. “Once tropical cyclones form, they generally move in a west-northwest direction, although once in a while one may recurve to the east.” Goswami explained, when asked why more cyclones hit India's east coast.

In 2008, a study by the Organisation for Economic Cooperation and Development (OECD) mentioned Visakhapatnam among the port cities with high exposure and vulnerability to climate extremes. The city is vulnerable on two counts – sea level rise due to global warming, and vulnerability to fierce tropical cyclones.

A recent study by The Energy Resources Institute (TERI) and USAID looked at how sea level rise and extreme weather events would affect Visakhapatnam's infrastructure and services. The study predicted inundation, waterlogging and floods in the city. It also identified hotspots within Visakhapatnam that were particularly vulnerable to storm surges and flooding due to cyclone and heavy rains.

Some of the vulnerable areas are residential, commercial, institutional, heritage and conservation sites. There are some ecologically sensitive areas as well.

The TERI-USAID study also analysed rainfall trends from 1979 to 2009 and found that even as the total monsoon rains decreased during the period and there were fewer rainy days, there was a rise in extreme rainfall incidences in the region.

On the face of it, Visakhapatnam and the Indian east coast's recent tryst with cyclones is in keeping with the IPCC's latest report, which cited a study that predicted the frequency of tropical cyclones would either increase or remain unchanged, while the intensity, as measured by maximum wind speed, could increase by 2-11% by the end of the century. Apart from storm damage, this can affect regional water resources. The report said rising levels of soot or black carbon and aerosols or very fine particles in South Asia resulted in a decline in sea surface temperature which, in turn, was linked to a reduced . Scientists observed a link between the reduced vertical wind shear in the region to an increase in the number of very intense storms.

A 2012 IPCC report on managing the risks of extreme events and disasters to advance climate change adaptation also said that heavy rainfall due to tropical cyclones are likely to increase with global warming. Also, the average tropical cyclone wind speed is likely to increase in some ocean basins.

But regional scientists caution that there are still large uncertainties in the links.

While most models do show that small-scale extreme rain events are likely to increase in a warming world, “there is no consensus on the trend of either frequency or intensity of tropical cyclones,” Goswami said.

According to him, this may be due to the fact that the global models that provide boundary conditions (boundary between air, land and water) for the regional models are generally of low resolutions and “their simulation of statistics of tropical cyclones have large biases.”

“There is no concrete evidence on the likelihood of the frequency and intensity of tropical cyclones increasing due to global warming” in the latest IPCC report yet, though it has concluded that the intensity of tropical cyclones is increasing, especially in the north Indian Ocean, said S.H.M. Fakhruddin, consultant, water engineering and climate risk management at the Regional Integrated Multi-Hazard Early Warning System (RIMES) in Bangkok. But, he added, in general, warmer ocean water temperatures will increase the intensity of a storm.

Tadepalli Satyanarayan Murty, tsunami expert and professor at the department of civil engineering, University of Ottawa, felt that Hudhud was not as strong as its predecessors that hit India’s east coast in recent years. The destructive cyclone that struck Bangladesh in 1970, for example, had a storm surge of nine metres; the 1997 cyclone in Andhra Pradesh was six metres; the 1990 cyclone again in Andhra Pradesh was four metres. The super cyclone that hit Odisha in 1999 had a storm surge of 8.5 metres. The storm surge in Phailin was five metres.

The 2012 IPCC report on extreme events observed that increased exposure to extreme weather events would result in higher direct economic losses from tropical cyclones, and the losses would depend on future changes in tropical cyclone frequency and intensity. Disasters associated with extreme climate events would also impact population migration and relocation, it added.

Bala said Hudhud demonstrated the “absolutely stunning” accuracy of prediction, in terms of the date, time, location and intensity of winds, three days ahead. “We must congratulate the India Meteorological Department for their improving forecasts in recent times. The lead time of three days was wisely used by the disaster management team to save lives,” he added.

That was in the coastal region. What the weatherman had not foreseen was the Hudhud would fail to lose its intensity over land. The result was 19 deaths in Uttar Pradesh, according to the state government, and then the deaths due to the avalanche in the Himalayas in western Nepal.

Source : <http://www.thethirdpole.net/fierce-cyclones-could-be-linked-to-climate-change/>