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Coastal geohazards and storm surges: The Indian context

K. S. Murty
101/28 Hindustan Colony, Amaravati Road, Nagpur 440033, India. murtysk1931@yahoo.co.in

India is blessed with a bountiful variety of habitats: from the coast to the Himalayas, the diversity of India's natural habitat is virtually unmatched. The major physical features of India and her geogrphical position in the Indian Ocean indicate a centuries-old relationship with the sea. In view of the location and height of the Himalayas, the country's trade routes are situated on the coast. The coastline extends over 6,000 kms and deep into the Indian Ocean, with vast expanses of sea on three sides, and it also suggests the intensity of the relationship between the country and the sea. If the Himalayas are in a severe seismic zone, the coastline is equally subject to severe geohazards, like cyclones. Several millions of people depend on the coastal bounty for survival. The 2004 December tsunami is a harsh reminder of the sufferings of those mllions. In the last 100 years, while earthquakes accounted for the death of 80,000 people, cyclones caused death of 120,000 people, including 15,000 by the tsunami of December 26, 2004. India's ranking in the top 10 disasters varies from 1st to 7th, with tropical cyclones occupying positions at 2nd to 7th, between 1737 and 2000 A.D. Recording of disasters in India has been poor. Attention to disasters was very poor, despite several cyclones that hit the Andhra coast in 1977 and 1978. The 1977 cyclone caused more than 8,500 deaths of human beings. 30,000 heads of cattle and 244,000 goats. No year passes without a cyclone hitting the east coast of India and the seasonal frequency varied between 0 in February to 4 in October-November on the east coast, with a maximum of 13 on the west coast in October, as recorded between 1891 and 1982. In coastal India, a 24-km wide belt has been identified as a hazard zone by the cyclonic Review Committee in 1984, while the wind damage could extend over a much wider belt upto 100 km inland and the tidal bore may sweep deep inside the land through the mouths of the rivers. The 1999 cyclone that hit the Orisaa coast killed more than 15,000 people and rendered more than a million people homeless. Shelters have been built in the cyclone-prone areas on the coast and the communication systems have been modernised. After the 2004 tsunami, a storm surge and tsunami warning system as been set up that operates from Hyderabad. This involved strengthening the exisiting seismological network to indicate near real time occurence of a tsunamigenic earthquake. The surge during the 1977 cyclone was one of the most devastating surges in the recent past along the east coast of India. The Indian Meteorological Department installed cyclone warning centres on the east coast. Detection radars have been installed that can track cyclones within a range of 400 kms from the coast. Beyond this range, satellite imageries are used. The OCEAN SAT-1 AND 2 serve this purpose. Climate change is expected to cause rise of sea levels and countries with vast coastlines have necessarily to take appropriate steps to face the challenge in future and India is among them.