

Killer Tsunami of December 26th, 2004: Implications to coastal zone management

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At 0628hrs IST on the morning of December 26th, 2004, a shallow earthquake with focus at a depth of 10 km, and a magnitude of 8.9 on the Richter scale occurred, with epicenter located at 3.298°N-95.779°E off Sumatra, Indonesia. The earthquake's epicenter was located at 257 km SSE of Banda Aceh, Sumatra, Indonesia; 990 km SSE of Port Blair, South Andaman Sea, India; 1806 km ESE of Colombo, Sri Lanka; and 2028 km SE of Chennai, India. As a consequence to this seismic activity tsunamis were generated which hit different coasts in the Indian Ocean with devastating effects, to both human life and property. Both the east and west coasts of India, particularly parts of eastern coast were the worst hit. Although entire Kerala coast experienced the effects of tsunami waves, a stretch of 10 km along the Kayamkulam estuary (9° 2' N to 9° 9.5' N), was the most affected in terms of inundation, run up, and erosion. Coastal inundation was rampant along this stretch with run up extending up to 1.5 km eastward from the shoreline, with the influx brought by tsunami. After witnessing the devastating power of the sea in destruction of concrete structures as well as seawalls constructed for protecting the coast, it would be prudent to leave a safe buffer zone from the shoreline. It would be wise to adhere to the coastal regulation zone act. The present tsunami effects have amply demonstrated the lesson, which nature teaches time and again, that seawalls are not the panacea for coastal erosion problems.

The need of the hour is to have capabilities to predict tsunami occurrence. Another area that needs research attention is the role of resonance amplification in explaining why along the coastlines of bays and gulfs the tsunami amplitudes are so large while at other nearby locations the amplitudes are considerably smaller. Therefore scientific emphasis should be on better predictions of earthquake epicenter and intensity, the physics of tsunamis, and the consequent run up and inundation patterns. The same information is vital for flooding and storm surge eventualities. Increasing the public awareness, and dissemination of run up and inundation patterns to civic administration for evacuation management, would certainly curtail the intensity of devastation of life and property.