New ways to protect coasts from tsunami

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A group of faculty members from NITK Suratkal led by **Dr Babloo Chaudhary**, Assistant Professor, Department of Civil Engineering, is working on the development of new techniques which can be used for the protection of Indian coasts from the devastating impacts of tsunami as part of an R&D project sponsored by the Ministry of Ports, Shipping and Waterways, GOI. A press release stated that NITK has been awarded a research grant of Rs 45 lakh for this purpose. Prof Katta Venkataramana and Dr G Sridhar are Co-Investigators.

Under this project, they will develop new techniques for the breakwater of New Mangalore Port (NMP) which can make the breakwater resilient against tsunami-induced damage. The resilient can block tsunami in the sea or at least reduce the highest of the tsunami up to a great extent.

A breakwater is a coastal structure that is built to protect the seashores from the adverse effects of sea waves. It is constructed in the sea (near the seashores), and stands on the seabed. Generally, the breakwaters are used for ports and harbours to protect the port from the destructive effects of the waves and provide tranquil seawater in the port area so that port activities such as loading, and unloading of cargo and passengers from ships can be done smoothly. Unfortunately, the breakwaters are vulnerable to tsunamis. Many breakwaters were damaged and even collapsed during the past tsunamis like the 2004 Indian Ocean Tsunami and 2011 Great East Japan Earthquake and Tsunami. Almost all the ports and harbours along the coastlines of the Indian peninsula have another type of breakwater known as Rubber Mound Breakwaters. The rubber mound breakwater is built by placing huge blocks of quarry rocks on the seabed. Since the breakwater has no foundation, it may not withstand a catastrophic event such as a tsunami. Therefore, it is of utmost importance to develop countermeasures for future tsunamis.

In the present project, the breakwater of NMP will be modeled (scaled down) in the laboratory; and tests will be conducted in the tsunami flume facility developed by the professor, which is the only one of its kind in the country. The uniqueness of the flume is that it can be used for earthquake motion as well tsunami generation. The performance of the existing breakwater under tsunami impact would be studied first. Later, the breakwater model will be made resilient by adding countermeasures such as placement of geogrids, gabions, and geobags in the main body of breakwater; and insertion of sheet piles, and geogrid in the seabed foundation soils.

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