

NIT-K to develop resilient breakwater against tsunami

Centre awards research project to National Institute of Technology-Karnataka in Surathkal with a view to preventing devastating impact

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The Union Ministry of Ports, Shipping and Waterways has awarded a research project to the National Institute of Technology-Karnataka (NIT-K), Surathkal, to develop new techniques for the protection of coastal area from the devastating impacts of tsunami.

The focus of the particular project is to develop new techniques for the breakwater of New Mangalore Port (NMP) which can make the breakwater resilient against tsunami-induced damage.

The resilient breakwater can block the tsunami in the sea or at least reduce the height of the tsunami waves to a great extent. In this way, tsunami can't reach the seashore and thus, tsunami-induced damage can be prevented or reduced to a great extent.



A breakwater in sea at Panambur near New Mangalore Port. ■ FILE PHOTO

Assistant Professor in the Department of Civil Engineering in the institute Babloo Chaudhary is the principal investigator of the ₹45 lakh project titled "New re-

silient breakwater for safety of port and harbour against tsunami".

Katta Venkataramana, a professor, and G. Sridhar, Assistant Professor of Civil

Engineering, both belong to the department, are co-investigators of the project.

A breakwater is a coastal structure which is built to protect the seashore from

the adverse effects of sea waves. The breakwater is constructed in the sea (near the seashore) and it stands on the seabed.

Generally, breakwaters are used for ports and harbours to protect the port from the destructive effects of sea waves. They provide tranquil seawater in the port area. Moreover, breakwaters are also used for the protection of seashore from tsunami.

However, breakwaters are vulnerable to tsunamis. Many breakwaters were damaged and they even collapsed during tsunamis like the one in the Indian Ocean in 2004 and also in the Great East Japan Earthquake and the Tsunami in 2011, a NIT-K release on Tuesday quoted Mr. Chaudhary as saying.

Tsunamis are triggered by earthquakes. Therefore,

studies should be conducted to determine whether the developed countermeasures are effective during an earthquake that precedes a tsunami.

In the proposed project, the breakwater of New Mangalore Port will be modelled (scaled down) in a laboratory and tests will be conducted in a tsunami flume facility to be developed by the team members of the project.

The uniqueness of the flume is that it can be used for earthquake motion as well as tsunami generation. The performance of the existing breakwater under tsunami impact will 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 by insertion of

sheet piles and geogrid in the seabed foundation soils, the release said.

According to Mr. Chaudhary, several physical model experiments and computer-aided simulations will be carried out to evaluate the effectiveness of the techniques and countermeasures against an earthquake and tsunami.

"The countermeasures proposed in this project will not only be specific to New Mangalore Port breakwater but they will also apply to breakwaters across the coastline of the country," he said.

"All these countermeasures will be cost-effective and environmental friendly. Some of these techniques are applicable for existing breakwaters. However, other techniques are suitable for new breakwaters," Mr. Chaudhary said.