

GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. 3088
TO BE ANSWERED ON **THURSDAY, August 07, 2014**

Discovery of Stanford University Scientists on Tsunami

3088. SHRI PALVAI GOVARDHAN REDDY

Will the Minister of **EARTH SCIENCES** be pleased to state:

- (a) whether it is a fact that Stanford University scientists have discovered ways to find out the Tsunami before 20 minutes of its occurrence, if so, the details thereof; and
- (b) to what extent the above discovery helps in reducing the damage that is caused due to Tsunami?

ANSWER

MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES (Independent Charge)
(SHRI JITENDRA SINGH)

- (a) Yes Sir. We understand that the scientists of the Stanford University have conducted preliminary experiments to simulate propagation of sound waves in the ocean due to the rupture on the sea floor during the 2011 Earthquake occurred off the coast of Japan. The basic principle is that sound waves propagate through seawater about 7 - 9 times faster than the tsunami waves, the difference in travel time of sound wave and tsunami wave could be used for possible early warning by few minutes. In the present case, the earthquake occurred at a depth of a shallow depth of 10 km resulting to rupture and vertical movement of oceanic plate, hence it was possible to simulate tsunami wave propagation.
- (b) The practical utility of this study for tsunami early warning is yet to be established as there are several constraints associated with this hypothesis, viz., geological features, characteristics of sound waves, propagation, deciphering the sound signals from other sources. However, further studies are required to test the repeatability of the above results and to develop/customise ocean/land-based sensors that can be deployed to record acoustic waves. Further, techniques need to be developed for real-time data analysis of acoustic data so as to adopt this technique for operational tsunami warning.
