

COMPILED AND EDITED BY THE **CONNECT TEAM** BASED ON INPUT FROM
THE FEATURED **RESEARCHERS**

KUSALA RAJENDRAN (PROFESSOR, CENTRE FOR EARTH SCIENCES):



(MANOJ SUDHAKARAN)

Earthquake mechanisms, recurrence and hazard evaluation

The Himalaya—formed by the India-Eurasia collision about 40 million years ago—is the northern boundary of the Indian subcontinent, and Burma-Andaman arc is its eastern boundary. Both of these are active tectonic boundaries which have made parts of the Indian subcontinent exceptionally vulnerable to earthquakes and resultant hazards like tsunamis. Kusala Rajendran's research seeks to further our knowledge on how earthquakes are generated along the plate boundary systems and to develop source and recurrence models, leading to more effective earthquake and tsunami preparedness and hazard mitigation. Her investigations have led to several recent publications in leading international journals.

Rajendran's ongoing projects, many of them in collaboration with CP Rajendran, a professor at the Jawaharlal Nehru Centre for Advanced Scientific Research, are

helping develop a better database for earthquake hazard models for the central Himalaya region. Based on archaeological and historical data as well as geological proxies, she and her team have dated the last great earthquake in this region at around 700 years ago. Only a few months before the high-magnitude earthquake that hit Nepal, her seismo-tectonic models predicted a large strain build up and a renewal time of about 600 years, meaning that this segment of the Himalaya was due for the next big earthquake. Rajendran's research also suggests that the Nepal earthquake in 2015 ruptured only about 150 km length of the fault, leaving adjoining segments ready for future earthquakes.

One of her research projects, funded by Indian National Centre for Ocean Information Services (INCOIS), aims to build earthquake source models for the Andaman-Sumatra plate boundary and the Indian Ocean earthquakes and also developing tsunami cycles. Studies by Rajendran's team along the Andaman and Nicobar Islands and the east coast of India suggest that tsunamis had occurred there in the past with an approximate interval of 500 years. These observations together with the numerical models for coastal inundation provide inputs for the Indian Tsunami Early Warning System at INCOIS.



At Sidhababa Cave, Nepal, during a field work with students and collaborator. The field work was to determine whether there was any damage within the cave due to ground shaking after the 2015 earthquake.



Rajendran with her team (MANOJ SUDHAKARAN)