

Printed from

THE TIMES OF INDIA

Study on temblors to help build quake-proof structures

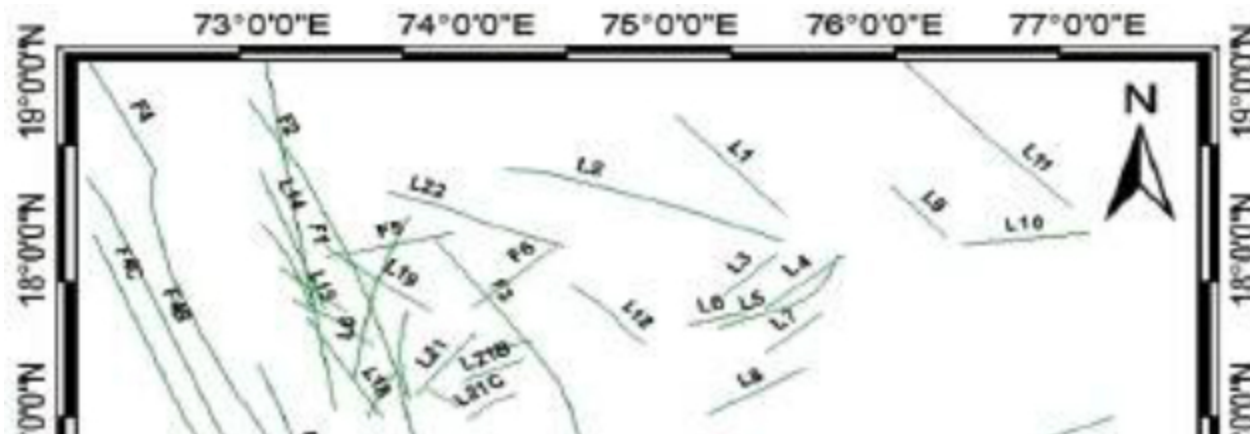
TNN | Sep 21, 2018, 11.21 AM IST

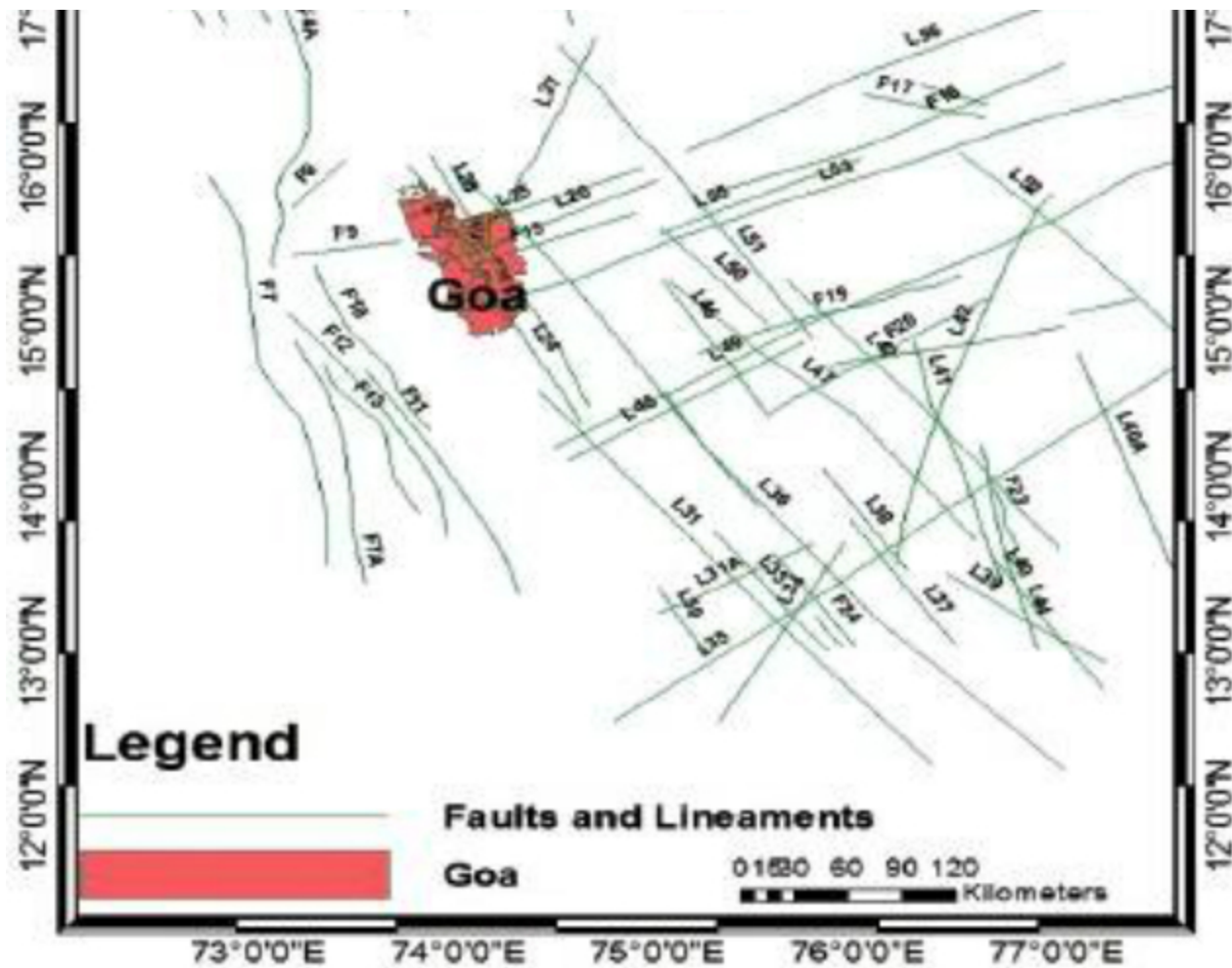


MARGAO: Even as Kerala picks up the pieces in the aftermath of the floods that ravaged the state, the preparedness of Goa in responding to natural disasters has come to the fore. However, a 2014 research by civil engineering professors has led to the development of fault and seismicity maps for Goa. The tectonic maps are expected to help in construction of quake-proof buildings in Goa.

A research paper, 'Different seismicity levels for the state of Goa, India,' authored by Nisha Naik, associate professor of civil engineering, Goa Engineering College, Farmagudi, and Deepankar Choudhury, professor of civil engineering, IIT Bombay, explains the seismic hazard analysis carried out by them for Goa, considering three scenarios, based on which seismic

hazard maps were developed for the state, for the first time.





“In the first scenario, it is considered that all the faults and lineaments are capable of producing earthquakes, and in the second, it is assumed that the past history is the worst that could have happened and only those faults and lineaments are considered in the vicinity of which earthquakes have occurred in the past. The third scenario is obtained from the two scenarios and is considered to be of middle level severity compared to the first and second scenario,” the paper states.

The seismic hazard maps are developed for the three scenarios and the analysis is done with respect to Mapusa, Panaji, Ponda, Margao and Vasco.

The study shows that the maximum hazard level occurs at the southwestern region of Goa which is found to be in Canacona taluka for all three scenarios and partly in the southern part of Quepem taluka along with the Canacona taluka for scenario 1.

“As more faults/lineaments become stressed or active, the highest hazard is observed in the southwestern portion of Goa state. The hazard in the central part of Goa increases and spreads over to northern and the eastern region in the most critical scenario 1,” the paper states.

The fault map and the seismo-tectonic map of Goa that were developed attempt to ascertain the extent of influence of past earthquakes in the seismic influence zone on Goa. A seismo-tectonic map shows the location of all seismic sources and seismic events occurring in the seismic influence zone.

In their paper titled, ‘Development of Fault and Seismicity Maps for the State’, Naik and Choudhary state that maximum intensity VII on MSK scale could be felt in the Goa in case of re-occurrence of past earthquake events at or near the same location. The MSK intensity scale is defined from I – XII.

“The occurrences of 1993 Latur earthquake and 1997 Jabalpur earthquake were unexpected and were big disasters. The other major earthquakes were 1967 Koyna earthquake which threatened the Koyna dam and the 2001 Bhuj earthquake. Goa is located about 250km from the Koyna dam and about 350km from Latur. A seismic study of Goa is essential as no such study is available,” the paper states. It states that Goa is placed in Zone III as per the seismic zonation map of IS 1893-Part I.

Explaining the application of the research for Goa from seismology point of view, Satyesh Kakodkar, assistant professor of civil engineering, Don Bosco College of Engineering, Fatorda, said the tectonic maps would aid in designing quake-proof structures in the state thereby enhancing Goa’s preparedness towards disaster response.

“In order to calculate rational estimation of seismic forces likely to act on the foundation and the structure, soil response during and after earthquake is essentially required to be studied. During earthquakes the soil deforms dynamically and carries the foundation with it. In turn the induced motion in the superstructure creates new stresses in the foundations. The maps will help engineers in predicting the soil response and seismic response to earthquake loading to prevent structural failures,” Kakodkar said.