Source : www.thehindu.com Date : 2018-10-02

# STUDYING FAULT LINES

Relevant for: World & Indian Geography | Topic: Important Geophysical phenomena - Earthquakes, Tsunamis & Volcanoes

Even very small reservoirs impounding water seasonally can cause deformation in the neighbouring region. Such deformation may add to the stress of a nearby fault, which if already critically stressed, can trigger an earthquake.

Based on Global Positioning System and satellite data, a team of researchers led by Vineet Gahalaut of the National Centre for Seismology, found crustal deformation in four reservoirs — Koyna, Tehri, Ukai, and Dharoi. These are of varying sizes and are located in different geological zones in India.

In two papers published recently in the journal *Bulletin of the Seismological Society of America*, the researchers concluded that there is “no lower threshold on the size of the reservoir to cause deformation” in the surrounding area.

A 6.3-magnitude earthquake near the Koyna dam that struck in December 1967, killing about 180 people, occurred about five years after it was built. Many smaller quakes occur each year .

“There are no reports of any earthquake from the other three reservoirs. But that does not mean there are no earthquakes. It is just that we don’t have adequate seismic monitoring network to collect data in these places,” said Mr. Gahalaut.

“The strength of the fault reduces when the reservoirs are full. Impounding of water causes stress, and the water that percolates from the reservoir lubricates the fault, thus reducing the frictional force, leading to reduced strength of the fault or even aiding the fault to fail, causing an earthquake,” he said.

In addition to deformation caused by loading of the reservoir, tectonic movement of crustal plates causes stress build-up. The fault fails, causing an earthquake, when the combined stress caused by the two factors crosses a critical point.

The researchers found that the eastern block of the Koyna-Warna fault zone is moving about 0.7 mm faster per year than the western block. Such anomalous motion adds stress to the fault, leading to earthquakes. Differences in the rock composition could be causing the differential movement. “We don’t know how much of compositional variation of the rock is needed for the differential motion between the blocks. We now need to study what is causing this differential motion,” said Mr. Gahalaut.



Last week Ram Kadam, a BJP MLA from Maharashtra, told the men in an audience that if they were interested in women who didn’t reciprocate the feeling,



END