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Local Seismicity around Tehri Dam, Garhwal Himalaya

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Abstract

Tehri dam with a height of 260.5 m is the highest earth and rock fill dam in India. It is situated on the confluence of the Bhagirathi and the Bhilangana rivers in the Garhwal Himalaya and located in the highly strained region of the north-western Himalaya. The region around Tehri dam lies in zone IV & V as per the seismic zoning map of India where the 1991 Uttarkashi earth-quake M_b~6.6 and the 1999 Chamoli earthquake M_b~6.4 have occurred.

The local seismicity in the environs of Tehri dam is being monitored for last more than two and half decades. For this purpose, a local seismological network was deployed by the Department of Earthquake Engineering in September 1993 under the scheme of Department of Science and Technology (DST). The network has been upgraded time to time. Presently, 18-stations of state-of-the-art seismological network is being operated around Tehri dam reservoir area. The spatial variation of local seismicity follows the trend of surface trace of MCT in the Garhwal Lesser Himalaya. The focal depth distribution of seismic events along and across the strike direction of the regional tectonic features reveal the confinement of activity within 10 to 15 km.

In the present paper, attributes of local seismicity for more than two and half decades have been presented for Tehri dam. In addition, the changes in seismicity due to dam reservoir as a part of Reservoir Induced Seismicity (RIS) has been studied and no correlation of seismicity activity with the dam reservoir filling has been observed even after about seventeen years filling/drawdown of dam reservoir.

Keywords: Microearthquake, Seismicity, MBT, MCT