

Special Issue

Seismology in India—An Overview

ABOUT THIS ISSUE

India is unique as far as earthquakes are concerned. The northern part of India, the Himalayan frontal arc, is seismically one of the most active intracontinental regions in the world, where four great earthquakes, i.e. the 1897 Shillong earthquake, the 1905 Kangra earthquake, the 1934 Bihar-Nepal earthquake and the 1950 Assam earthquake, occurred in a short period of 53 years. The 1819 Rann of Kutch earthquake provided the earliest well-documented instance of faulting during an earthquake. The 'Allah Bandh' created by it was some 25 kilometres in length and 3 metres in height. R. D. Oldham, then director of the Geological Survey of India, identified Love and Rayleigh waves on seismograms of the 1897 Shillong earthquake. His monograph is one of the most important source books in seismology. In recent years, the Shivaji Sagar Lake created by Koyna Dam in Maharashtra became the world's best-known example for reservoir-induced seismicity. The largest known reservoir-induced earthquake, of 6.3 magnitude, occurred on 10 December 1967 at Koyna and the activity is still continuing.

In the recent Uttarkashi earthquake of 20 October 1991, which claimed over 1500 human lives, the truth of the old saying "houses and not earthquakes kill people" was once again proved. Poorly constructed houses were devastated while houses with proper design survived even in high-intensity areas.

While short-term prediction of earthquakes has not yet become a reality, zones where great earthquakes are likely to occur are fairly well-known. It is necessary to estimate the hazard potential of the possible locales of future earthquakes taking into account geological features, damage during past earthquakes, and other factors, and make preparations such as designing and building quake-resistant structures to mitigate the effects of an earthquake in such zones. In India, which has not been affected by a great earthquake since 1950, there has developed a false sense of security. This issue of *Current Science* is intended to focus attention on strengthening seismology-related work in India. This is especially appropriate for the nineties, the 'International Decade of Natural Disaster Reduction' (IDNDR).

This issue puts together work in different topics of seismology in the last two decades. The last such effort was made in 1970 by the Indian Geophysical Union, Hyderabad, when a special issue on seismology in India was brought out on the occasion of the Upper Mantle Project symposium. The present issue has 21 articles by leading seismologists from universities, research institutions and government departments. These articles deal with field and instrumental studies of earthquakes; crustal and upper mantle structure; focal mechanism, tectonics and stress field; strong motion recording, seismic zoning and earthquake risk map; reservoir-induced seismicity; and earthquake precursors-related studies in India.

Harsh K. Gupta