

# **Seismic hazard microzonation can play a major role in earthquake disaster mitigation**

**J R Kayal**

Formerly: Geological Survey of India, Kolkata

Member: The Mining Geological and Metallurgical Institute of India, Kolkata

Email: [jr.kayal@gmail.com](mailto:jr.kayal@gmail.com)

Earthquake prediction with exact *time, space and magnitude* is yet to be achieved by the geoscientist community of the world. Even if a successful (?) prediction is achieved, it may not be of much practical benefit to the society. If a large earthquake is predicted near a populated city area, say few weeks in advance, is it possible to evacuate the city for weeks or is it possible to save the properties and buildings in the city? The seismic hazard microzonation (SHM) has emerged as an important tool to mitigate earthquake disaster in saving lives as well as properties. The SHM evaluates the ground shaking and related phenomena due to local site conditions based on geological, geophysical, geotechnical and seismological investigations. On the basis of estimated SHM, a geographic domain is divided into small units of likely hazard / risk levels, called SHM map. This map may be used not only for disaster management but also for making safe buildings / urbanisation to mitigate earthquake disaster.

Some 50 years back casualties were almost same in developed and in developing countries for a large earthquake. Today, the developed countries minimised it (almost to zero), but in the developing countries casualties as well as property losses are rather much enhanced, may be by 100 times, due to population explosion, unawareness and irresponsible non-engineered construction in earthquake prone areas. For an example, the 1905 great Kangra earthquake ( $M \sim 8.0$ ) in the western Himalaya caused some 19,000 casualties, but if such event occurs today it would cause some 1.9 million casualties due to population growth, unawareness and irresponsible constructions. In India, the government has taken much initiative for preparing SHM maps for almost all (about 80) cities in the country and for educating common people about seismic hazards, but people are yet to develop awareness. I believe that the civil engineers have a great role in implementing the SHM knowledge in designing safe buildings and the media to develop awareness to mitigate natural disasters.

*Key words:* Seismic hazards, microzonation, earthquake prediction, geological geophysical geotechnical and seismological investigations.