# Economic and Environmental Concerns of Himalayan Earthquakes with Example of Mw 7.6, 2005 Kashmir Earthquake

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The Himalayas represent one of the most active mountain system in the World. It has hazard of shallow (< 20 km) earthquake due to head-on collision of the Indian and Eurasian plates. The great earthquakes (> Mw 7.0) are located along the segments of the Himalaya arc with recurrence interval of ~ 300 Ma ±100 Ma. The devastating Mw 7.6, October 08, 2005 Kashmir earthquake occurred along the northwestern segment the Himalayas arc. Its epicenter was located about 26 km north of the Muzaffarabad with focal depth of about 11 km. The earthquake occurred along the active Balakot-Bagh fault (BBF) of the Himalayan trend (NW- SE) with a ground rupture of ~70 km and throw between 2-7 m. It was destructive with intensive ground-shaking, ground rupture, landslides, and building collapse over a vast region of 30,000 sq km. Most of the building in the town of Balakot, Muzaffarabad, Garhi, Chikar Khas, and Bagh located along the trace of the fault were destroyed with estimated economic loss of US$ ~5.1 billion and ~86,000 human lives, displacement of ~ 500,000 families, and loss of ~ a million jobs. As a matter of concern, this earthquake of relatively lower magnitude caused more deaths as compared to many great earthquakes of even higher magnitude along the Himalayan arc due to over-population along the active fault. Pakistan is seismically most active, due to the active convergent (Himalayas/Makran) and strike-slip Chaman fault systems, with examples of destructive earthquakes such as Mw 7.5, 6 June 1819 Run of Kutch Sindh with 3200 casualties, Mw 7.8, 24 September 1827 Lahore with ~1000 casualties, Mw 7.7, 31 May 1935 Quetta with 40,000-60,000 casualties, Mw 8.1, 28 November 1945 Pasni with

~4000 casualties, and Mw 7.7, 24 September 2013 Awaran Baluchistan with ~1000 casualties. These earthquakes raise concerns for identification and mitigation of future earthquake hazard to avert economic and human losses. This presentation is an attempt to create awareness about the earthquake hazard in the concerned quarters. Both, Government and Public are urged for safety measures with restricted development in the red zones, relocation of population away from the active faults, declaration of high-risk earthquake hazard zones as State Parks, establishment of museums for earthquake awareness/education, and construction of earthquake resistant buildings for sustainable development.