

A continuation of the Asia-Pacific Risk Index for natural disasters: extending the record for an updated analysis from 1900-2015

James Daniell (1,2), Trevor Daniell (3), Katherine Daniell (2,4), Bijan Khazai (1), Andreas Schaefer (1), and Friedemann Wenzel (1)

(1) Geophysical Institute & Center for Disaster Management and Risk Reduction Technology, Karlsruhe Institute of Technology, Karlsruhe, Germany (j.e.daniell@gmail.com), (2) General Sir John Monash Scholar, General Sir John Monash Foundation, Melbourne, Australia., (3) Faculty of Engineering, Computing and Mathematical Sciences, The University of Adelaide, Adelaide, Australia., (4) ANU College of Arts and Social Sciences, Australian National University, Canberra, Australia.

In 2010, an Asia-Pacific risk index was created for the CECAR5 (Civil Engineering Conference for the Asia-Pacific Region) by Daniell et al. (2010a) for floods and earthquakes, using empirical and analytical risk data for direct as well as socio-economic community vulnerability.

The socio-economic situation of countries can aggravate the physical risk of natural disaster impacts, as demonstrated by the impacts of earthquakes in Christchurch and Tohoku 2011; add to this a number of deadly typhoon (Haiyan 2013), cyclone (Yasi 2011), flood (Thailand 2011), bushfire and weather effects, and significant changes to the index in 2010 have been seen. At least 10,000 historical events have been recorded since 1900 across the Asia-Pacific region (western Pacific).

The database for global socio-economic indicators was produced to allow comparison of countries in terms of their socio-economic situation for use in risk studies. In addition, a global damaging natural disasters database (CATDAT) has been created over the last 14 years to better understand the historical impact of natural disasters on the Asia-Pacific region as well as globally.

Simplified hazard models have been used in conjunction with historical damage data added to human exposure. Post-flood and post-typhoon loss models have been produced this methodology.

The relative country level rural and urban building inventories and historical building trends are used to define levels of vulnerability, exposure and hazard. From this, physical and community risk indices are derived for the countries of the Asia-Pacific region. It was found that the vulnerabilities in communities of developing countries such as Indonesia and the Philippines can further intensify the impact from direct damages by many times, showing the increased need for earthquake and flood risk reduction policy.

Trends based on HDI and other indicators within the fields of economy, poverty, demographics, governance and environment are also presented, showing the influence of these factors on country-level fragility and resilience showing Philippines and Japan to be the highest at risk countries in absolute and relative terms.

(a) Daniell, J.E., Daniell, K.A., Daniell, T.M. & B. Khazai: A country level physical and community risk index in the Asia-Pacific region for earthquakes and floods, Paper No. 0392, 5th CECAR Conference Proceedings, Sydney, Australia, 2010.