Towards harmonized seismic hazard assessment in the Asia Pacific region

*Ken Xiansheng Hao[1,2], Hiroyuki Fujiwara[1], Marco Pagani[2]

1.National Research Institute for Earth Science and Disaster Prevention(NIED), 2.Global Earthquake Model Foundation(GEM)

Nowadays –even in developed countries –earthquake occurrence is causing surprise and showing the necessity of introducing risk reduction policies, which should be instead part of enduring initiatives. Promoted by OECD, since 2009 the Global Earthquake Model initiative (GEM) is trying to raise awareness and promote a collaborative assessment of earthquake risk. The GEM Foundation is currently a growing public-private partnership, including over 10 private companies active in the financial and engineering sector, and more than 20 public organizations and associate members encompassing international organizations such as the UN International Strategy for Disaster Reduction. GEM released the OpenQuake-engine in 2013 and OpenQuake Platform in 2015, the latter providing access to seismic hazard and risk models (SHA), datasets and tools (http://www.globalquakemodel.org/openquake/about/platform/). One of GEM's main targets is to work together with local communities on building a global SHA mosaic of hazard and risk models within 2018.

Appointed as the organization in charge of developing national SHA in Japan, NIED is fully committed with GEM and is working at the national and regional level to promote GEM principles. NIED joined in 2012 GEM as a representative of Japan to strength the public part of GEM's partnership and to share with the global community the Japanese experience gained during the recent destructive events, particularly on hazard modeling. The lessons learned after the 2011 Tohoku-oki for example are particularly relevant. In the new hazard models created by NIED after a four years effort, various changes and improvements have been introduced to address the lack of large earthquakes along the main subduction structures particularly along the east coast. For example, in the case of the Nankai Trough the 2014 model contains a set of 15 mutually exclusive occurrence cases where each case may contain independent ruptures is used to model the occurrence of the largest events. The Openquake-engine, GEM's core technology, has recently adapted the unique idea and supported its modeling approach, which might be also used now for other subduction interface sources.

In the last decade NIED carried out a series research cooperation projects with neighboring regions and distance countries particularly after the 2008 Wenchuan earthquake. Examples of these collaborations are the JST-MOST-NRF strategy SHA program which involved Japan-China-Korea between 2010 and 2013, the series of Japan-Taiwan-New Zealand SHA workshops, as well as interaction exchanges with numerous professional and organizations. With most open databases, open-source software and state-art technology, and professional and leading organization, GEM supports NIED in these international collaborations aiming at exchanging experiences and to the promotion of common standards and model in the East Asia region, the Asia Pacific region, as well as global region.

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