

Regional to country-based seismic hazard modeling A sample case: Earthquake Model of the Middle East (EMME) Project to Revision of National Seismic Hazard Maps of Turkey Project

Sinan Akkar¹ 

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Seismic risk mitigation and minimizing the loss of human lives as well as social and economic disruption due to earthquakes depend on reliable seismic hazard assessment. Global and local collaborative efforts in this perspective should be integrated to provide transparent, consistent and public-open models and tools to harmonize the seismic hazard around the globe. One of the most successful programs to serve for this objective is the GSHAP Global Seismic Hazard Program that delivered the worldwide distribution of 475-year return period peak ground acceleration (PGA). The challenge in sustainable and progressive improvement of global seismic hazard assessment that is, literally, initiated by the GSHAP program is currently undertaken by the non-profit Global Earthquake Model (GEM) Organization (www.globalquakemodel.org). GEM not only aims to provide harmonized seismic hazard models around the world but also gathers worldwide data and experts to develop tools and resources for transparent earthquake risk assessment anywhere in the world. Seismic Hazard Harmonization in Europe (SHARE; www.share-eu.org) and Earthquake Model of the Middle East (EMME; www.emme-gem.org) projects are recently finished regional projects under this viewpoint for estimating hazard in the broader Europe and the Middle East extending to the Afghan borders, respectively. The former project is granted by the European Council under the 7th Framework Program whereas the latter project is supported by the industry (JIT) for public safety against earthquakes. GEM Organization is involved closely in these two sister projects and they are considered as regional programs within the GEM main body. (GEM is currently finalizing two other similar sister projects in South America and Central Asia). SHARE and EMME projects started with a year of difference; SHARE being ahead and they cooperated closely to exchange knowledge and expertise in different topics of regional probabilistic seismic hazard modeling. Turkish scientists actively involved in these projects for seismic source modeling, ground-motion characterization and hazard calculations as Turkey is the border country between the neighboring regions covered by SHARE and EMME. A little after the

✉ Sinan Akkar
sinan.akkar@boun.edu.tr

¹ Bogazici University, Istanbul, Turkey

end of EMME, the The Disaster and Emergency Management Presidency in Turkey (public agency responsible of national seismic hazard map and building design code in Turkey) granted the “Revision of National Seismic Hazard Maps of Turkey (T-SHM)” project stimulated by the needs of improved definition of design ground-motion while updating the national earthquake design code. The project is also supported by the Turkish Catastrophe Insurance Pool (TCIP) for more sophisticated financial loss models to define well-constrained earthquake insurance premiums. The 2-year project gathered local earth scientists and earthquake engineers from different Turkish universities and institutions who are specialized in different topics of probabilistic seismic hazard assessment. Some of these experts participated in SHARE and EMME projects, which makes this local (national) project an example interface to show the interaction between regional and country-based seismic hazard assessment.

This special issue compiles and documents the main outcomes of EMME and T-SHM projects with emphasis on the recent state-of-knowledge in historical and contemporary earthquake catalogs, seismic-source and ground-motion characterization. The papers document the level of compatibility and interaction between regional and national hazard projects that use the state-of-art methods in seismic hazard assessment. Some of the papers in the special issue will also address the implication of new seismic hazard maps in the definition of lateral earthquake loads in the recently updated Turkish earthquake code.

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