Preventive Tools for a Disaster Resilient Society

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Policy development to deal with natural hazards involves multidisciplinary studies, elected officials, citizens and other stakeholders. Two very important, but fundamentally different, concepts need be considered: hazard and risk. For earthquakes, the hazard is the occurrence of a natural phenomenon such as ground shaking and risk is the probability of an adverse consequence of hazard on humans or their built environment caused by such sporadic events. For society, the goal of developing a seismic policy is to reduce seismic risk through hazard estimation, vulnerability and exposition reduction. History proved that Global Seismic Hazard Assessment Program (GSHAP, 1992–1999) maps are highly misleading and unreliable. Since 1999, all 60 earthquakes with magnitudes ≥ 7.5 were “surprises” for GSHAP: in half of the cases “big surprises” (DOI:10.3103/S0747923912020065). The Emilia (Italy) May 2012 earthquake extends inadequacy to medium-size events (*Eos*,93,Dec2012): the number of victims was limited by the day and time of occurrence. Also, the numbers of fatalities in recent disastrous earthquakes were much higher than that projected from GSHAP maps, by approximately two-three orders of magnitude (DOI:10.1007/s11069-012-0125-5). Advances in understanding the physics of earthquakes and the access to modern e-infrastructures allow realistic numerical simulation of seismic waves propagation (DOI:http://dx.doi.org/10.1016/B978-0-12-380938-4.00003-3) and the computation of reliable hazard scenarios (pos.sissa.it/archive/conferences/162/.../EGICF12-EMITC2_132.pdf) for use in preventing or reducing risk. This is an effective tool to impact Society and Economy in creating a community with a Disaster Resilient Society.