

عنوان مقاله:

LESSONS LEARNED FROM ELE STUDIES IN URBAN EARTHQUAKE-PRONE AREAS

محل انتشار:

هفتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1394)

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نویسندگان:

Dominik LANG - *Senior Advisor, NORSAR, Kjeller, Norway*

Abdelghani MESLEM - *Research Engineer, NORSAR, Kjeller, Norway*

Sergio MOLINA - *Professor, University of Alicante, Alicante, Spain*

خلاصه مقاله:

Predicting the likely consequences of an earthquake to a nation, a city or an individual facility is generally covered by the scientific field of earthquake loss estimation (ELE). Traditionally, ELE studies have been conducted empirically (e.g. Risk-EU approach) mainly because of a lack of instrumental ground motion data and the limitations of structural analysis techniques. However, with the advent of nonlinear structural analysis tools (e.g. the nonlinear static pushover analysis) and the introduction of Capacity Spectrum Methodologies (CSM), ELE studies have been more and more conducted in an analytical-predictive way. Analytical ELE studies for a test bed, i.e. a city or a region, require estimates on the expected groundmotion characteristics including effects of local subsoil conditions, vulnerability of the prevalent building and infrastructure typologies, as well as exposure of the same. The paper at hand discusses the challenges and the associated uncertainties that are inherently connected to each of the three components, ways to either minimize or handle these uncertainties, and how the final results of analytical ELE studies can still be considered as valuable output given the involved uncertainties. More importantly, the paper will shed light onto the technical and nontechnical problems and challenges involved during the practical conduct of ELE studies. These challenges may not only affect the practical conduct of the data collection, but also increase the uncertainties of collected input and inventory data, and not the least hamper the practical implementation of results and the initiation of mitigative actions. The paper will thereby relate to various ELE studies and risk mitigation initiatives that were conducted during past years mainly in developing countries.

کلمات کلیدی:

Uncertainty, Vulnerability, Exposure, Seismic Loss

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