



Modelling of the socioeconomic consequences of an earthquake at the urban scale and induced responsibilities.

Cyrielle Dollet and Philippe Guéguen

ISTerre, Université Grenoble Alpes, Université Savoie Mont-Blanc, CNRS, IRD, IFSTTAR, Grenoble, France

In moderate-to-low seismic hazard regions, the estimation of the socio-economic consequences of an earthquake at an urban scale is a costly, difficult but essential task, since the necessary resources become insufficient for seismic evaluation. However, public authorities have the duty to take into account this risk and mitigate it according to their resources. Thus, the positioning of the acceptable level of responsibility in the implementation of the earthquake regulations and the induced economic cost is a key issue. The responsibility of the public persons but also that of insurers in their approach to prevent is at the forefront when natural disasters happen. The modification of the seismic regulation has a direct impact on the level of responsibility. In this study, the impact of prevention's policies implemented is translated in terms of decision variables thanks to the qualitative analysis of the interviews conducted with elected representatives, insurers, technicians, lawyers and first-aid workers. Consequently the decision variables selected are damages to structures, the number of deaths, injuries, homeless people to be managed, the repairing's costs for damaged buildings or their destruction / reconstruction, the impact on economic activity (business interruption) and responsibility. Thus, in this study, by analyzing the existing global earthquake data bases as well as the literature, a loss database listing all the world earthquakes between 1906 and 2018 with a magnitude greater than 4.5 has been updated and prepared showing the social losses (dead, wounded...) and economic losses (direct and indirect costs, number of buildings destroyed or damaged...), in relation with the ground motion footprint provided by USGS Shake-Map. In this talk, we first analyzed the relevancy of information contained in the databases, related to earthquakes and induced losses and we propose a first analysis of the flat file from the database, in terms of loss prediction and consequences.