

Seismic and volcanic risk assessment considering interactions in a multi-risk framework

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A multi-risk approach adopts a multi-hazard and a multi-vulnerability perspective in which the problems of risk harmonization and risk interactions become the fundamental scientific issue. Volcanic areas are generally located in geodynamic and geographic contexts in which multiple hazardous events such as earthquakes or landslides can affect independently or in cascades of events the same exposed elements. The multi-hazard is then a wide concept that, in general terms, can be split into two possible lines of applications:

(1) multi-hazard assessment may be seen as the process of assessing different (independent) hazards threatening a given (common) target area, and (2) it represents the process of assessing possible interactions or cascade effects among the different hazardous events.

In this work, we analyse different cases of cascading effects among hazards in Naples, Italy. We analyse in particular the seismic and specific volcanic hazards considering some interactions at the hazard level (i.e. cases in which the occurrence of one event/hazard affects the occurrence probability of another), and interactions at the vulnerability level, in which the effects on exposed elements caused by one hazard, will affect the element's vulnerability to the other one. The analysis described in this paper has been carried out in the framework of the FP7 European project 'MATRIX' (New multi-hazard and multi-risk assessment methods for Europe), and the project 'Quantificazione del Multi-Rischio con approccio Bayesiano: un caso studio per i rischi naturali della città di Napoli', funded by the Italian Ministry of Education, Universities and Research (Ministero dell'Istruzione, dell'Università e della Ricerca).