Infruence of large earthquakes on the seismic hazard evaluation: Case study for the Gulf area

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On 12 November 2017 at 18:18 UTC, magnitude 7.3 earthquake occurred on the Iran–Iraq border, with an epicenter approximately 30 km away from Halabja, at shallow depth of 20km. It was felt throughout the Gulf area and as far away as Pakistan and the United Arab Emirates. With more than 540 people killed and some 8,000 injured, as well as many more unaccounted for, it was the deadliest earthquake of 2017.

The earthquake was located within the Zagros fold and thrust belt, part of the broad and complex zone of continental collision between the Arabian and Eurasian Plates where the relative convergence of the plates is about 26 mm per year. The maximum intensity in the epicenter was VIII on the Mercalli intensity scale, which describes a severe shaking.

Although the most intense shaking experienced during earthquakes generally occurs near the rupturing fault and decreases with distance away from the epicenter, the shaking at one site can easily be many times stronger than at another site equally far from the origin. It is assumed that the earthquake mechanism and the regional and local geologic conditions are the cause of that difference in shaking and supplementary research is needed to investigate which settings and parameters are the most responsible.

Macroseismic data suggested that this type of large earthquakes produce wide scale damage and many hundreds of deaths and injuries. Further modelling work based on factors such as the size of the event, population density and what is known about the local construction practices is required for the Gulf region. Combining this information with estimates of where and how often earthquakes will occur would allow for better seismic hazard and risk calculation, building design and mitigation strategies for future large earthquakes.