



A review of multiple natural hazard risks in Germany

Heidi Kreibich (1), Kai Schröter (1), Philip Bubeck (1), Stefano Parolai (2), Bijan Khazai (3), James Daniell (3), Michael Kunz (4), Holger Mahlke (4), and Tobia Lakes (5)

(1) German Research Centre for Geosciences GFZ, Section 5.4 Hydrology, Potsdam, Germany (kreib@gfz-potsdam.de, ++49 331 2881570), (2) German Research Centre for Geosciences GFZ, Centre for Early Warning, Potsdam, Germany, (3)

Karlsruhe Institute of Technology KIT, Geophysikalisches Institut, Karlsruhe, Germany, (4) Karlsruhe Institute of Technology KIT, Institute for Meteorology and Climate Research (IMK-TRO), Karlsruhe, Germany, (5) Humboldt-Universität zu Berlin, Geoinformation Science Lab, Geography Department, Berlin, Germany

Germany is experiencing various natural hazards and their impacts are expected to increase due to socio-economic and climatic changes, if an efficient risk management is not able to counteract. The international disaster database EM-DAT lists 79 events, namely earthquakes (3), extreme temperatures (9), floods (18), wet mass movement (1), storms (47) and wildfire (1) between 1950 and 2011; all together causing more than 10.000 fatalities and more than 40 billion US\$ damage in Germany. The event with the highest human loss was the heat wave of 2003 with more than 9.000 fatalities. The event with the highest economic damage was the flood in 2002 causing €1.600 million damage.

The aim of this paper is to offer a new perspective on multiple risk assessments in Germany by giving a systematic and comprehensive review on existing hazards and risk management strategies. Such a multiple risk assessment is particularly important because the potential for a natural event to cause a disaster depends on how vulnerable an exposed community is to such hazards. Human actions can reduce the damage to people and property but can at the same time increase the exposure to risks and exacerbate the impacts of hazardous events. To significantly improve risk management, i.e. decrease vulnerability and increase resilience of a region, more effort is needed than the well-established hazard-specific risk assessments. Planners and decision-makers need to be aware of and informed about all pertinent hazards in a region. Thus, to compare different hazards and to evaluate changes in risk, we propose the need of a consistent multi risk assessment.