Geophysical Research Abstracts
Vol. 16, EGU2014-6209-1, 2014
EGU General Assembly 2014

A knowledge integration approach to flood vulnerability

Bruno Mazzorana (1) and Sven Fuchs (2)

(1) Department of Hydraulic Engineering, Autonomous Province of Bolzano, Bolzano, Italy (bruno.mazzorana@provinz.bz.it), (2) University of Natural Resources and Life Sciences, Institute of Mountain Risk Engineering, Vienna, Austria (sven.fuchs@boku.ac.at)

Understanding, qualifying and quantifying vulnerability is an essential need for implementing effective and efficient flood risk mitigation strategies; in particular if possible synergies between different mitigation alternatives, such as active and passive measures, should be achieved. In order to combine different risk management options it is necessary to take an interdisciplinary approach to vulnerability reduction, and as a result the affected society may be willing to accept a certain degree of self-responsibility. However, due to differing mono-disciplinary approaches and regional foci undertaken until now, different aspects of vulnerability to natural hazards in general and to floods in particular remain uncovered and as a result the developed management options remain sub-optimal. Taking an even more fundamental viewpoint, the empirical vulnerability functions used in risk assessment specifically fail to capture physical principles of the damage-generating mechanisms to the build environment.
The aim of this paper is to partially close this gap by discussing a balanced knowledge integration approach which can be used to resolve the multidisciplinary disorder in flood vulnerability research. Modelling techniques such as mathematical-physical modelling of the flood hazard impact to and response from the building envelope affected, and formative scenario analyses of possible consequences in terms of damage and loss are used in synergy to provide an enhanced understanding of vulnerability and to render the derived knowledge into interdisciplinary mitigation strategies. The outlined formal procedure allows for a convincing knowledge alignment of quantified, but partial, information about vulnerability as a result of the application of physical and engineering notions and valuable, but often underspecified, qualitative argumentation strings emerging from the adopted socio-economic viewpoint.