Geophysical Research Abstracts
Vol. 16, EGU2014-1216, 2014
EGU General Assembly 2014

Increasing stress on disaster risk finance due to large floods

Brenden Jongman (1), Stefan Hochrainer-Stigler (2), Luc Feyen (3), Jeroen Aerts (1), Reinhard Mechler (2), Wouter Botzen (1), Laurens Bouwer (4), Georg Pflug (2), Rodrigo Rojas (3), and Philip Ward (1)

(1) VU University Amsterdam, Institute for Environmental Studies, Amsterdam, Netherlands (brenden.jongman@ivm.vu.nl), (2) IIASA International Institute for Applied System Analys, Laxenburg, Austria, (3) European Commission - Joint Research Centre, Ispra, Italy, (4) Deltares, Delft, Netherlands

Recent major flood disasters have shown that single extreme events can affect multiple countries simultaneously, which puts high pressure on trans-national risk reduction and risk transfer mechanisms. To date, little is known about such flood hazard interdependencies across regions, and the corresponding joint risks at regional to continental scales. Reliable information on correlated loss probabilities is crucial for developing robust insurance schemes and public adaptation funds, and for enhancing our understanding of climate change impacts.

Here we show that extreme discharges are strongly correlated across European river basins and that these correlations can, or should, be used in national to continental scale risk assessment. We present probabilistic trends in continental flood risk, and demonstrate that currently observed extreme flood losses could more than double in frequency by 2050 under future climate change and socioeconomic development. The results demonstrate that accounting for tail dependencies leads to higher estimates of extreme losses than estimates based on the traditional assumption of independence between basins.

We suggest that risk management for these increasing losses is largely feasible, and we demonstrate that risk can be shared by expanding risk transfer financing, reduced by investing in flood protection, or absorbed by enhanced solidarity between countries. We conclude that these measures have vastly different efficiency, equity and acceptability implications, which need to be taken into account in broader consultation, for which our analysis provides a basis.