



## **Declining vulnerability to river floods and the global benefits of adaptation**

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The global impacts of river floods are substantial and rising. Effective adaptation to the increasing risks requires an in-depth understanding of the physical and socioeconomic drivers of risk. Whilst the modeling of flood hazard and exposure has improved greatly, compelling evidence on spatiotemporal patterns in vulnerability of societies around the world is lacking. Hence, the effects of vulnerability on global flood risk are not fully understood, and future projections of fatalities and losses available today are based on simplistic assumptions or do not include vulnerability.

In this study, we show that trends and fluctuations in vulnerability to river floods around the world can be estimated by dynamic high-resolution modeling of flood hazard and exposure. We show that fatalities and losses as a share of exposed population and gross domestic product are decreasing with rising income. We also show that there is a tendency of convergence in vulnerability levels between low- and high-income countries. Based on these findings, we simulate future flood impacts per country using traditional assumptions of static vulnerability through time, but also using future assumptions on reduced vulnerability in the future. We show that future risk increases can be largely contained using effective disaster risk reduction strategies, including a reduction of vulnerability.

The study was carried out using the global flood risk model, GLOFRIS, combined with high-resolution time-series maps of hazard and exposure at the global scale.

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