



## **Global flood risk modelling and its applications for disaster risk reduction**

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Flooding of river systems is the most costly natural hazard affecting societies around the world, with an average of \$55 billion in direct losses and 4,500 fatalities each year between 1990 and 2012. The accurate and consistent assessment of flood risk on a global scale is essential for international development organizations and the reinsurance industry, and for enhancing our understanding of climate change impacts. This need is especially felt in developing countries, where local data and models are largely unavailable, and where flood risk is increasing rapidly under strong population growth and economic development.

Here we present ongoing applications of high-resolution flood risk modelling at a global scale. The work is based on GLOFRIS, a modelling chain that produces flood risk maps at a 1km spatial resolution for the entire globe, under a range of climate and socioeconomic scenarios and various past and future time periods. This modelling chain combines a hydrological inundation model with socioeconomic datasets to assess past, current and future population exposure; economic damages; and agricultural risk. These tools are currently applied scientifically to gain insights in geographical patterns in current risk, and to assess the effects of possible future scenarios under climate change and climate variability.

In this presentation we show recent applications from global scale to national scales. The global scale applications include global risk profiling for the reinsurance industry; and novel estimation of global flood mortality risk. In addition it will be demonstrated how the global flood modelling approach was successfully applied to assess disaster risk reduction priorities on a national scale in Africa. Finally, we indicate how these global modelling tools can be used to quantify the costs and benefits of adaptation, and explore pathways for development under a changing environment.