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Projections of pluvial flood risk in urban areas calls for a black box in flood risk management

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Calculating the pluvial flood risk in urban areas can be quite accurate by using high quality data of the urban topography, fabric, and infrastructure, in combination with standardized software packages for the key hydrological and hydraulic processes. When trying to assess current risks numerous studies indicate that the vulnerabilities entail a large epistemic uncertainty that is likely to dominate the overall uncertainty. However, the mitigation measures are often very costly and should be depreciated over several or even many decades. Constructing projections of flood risk over such time horizons to assess the feasibility of such investments entails deep uncertainties of climatic changes, city development, and societal preferences. A case study of these deep uncertainties shows that strategies of urban development play a key role in shaping the future flood risk, but also that some mitigation strategies are efficient over a wide range of scenarios (Löwe et al 2017). A key uncertainty hence will be how society reacts to the increase in flood risk in urban areas. From a risk management perspective the most preferable scenarios seems to be those where the community will adapt a learning oriented approach to city development, especially by learning from experiences from other communities. Many scientific fields (aviation, chemical industry etc) have come far by implementing Safety Management Systems where black boxes are installed that can yield detailed information about individual events and – more importantly – have a structured process for minimizing future risks both locally and globally. If a similar approach was adopted in flood risk management the uncertainties of the projections would indeed be very small – and the overall risk would also be reduced substantially.

Reference.

Loewe R, Urich C, Domingo N, Mark O, Deletic A, Arnbjerg-Nielsen K. 2017. Assessment of urban pluvial flood risk and efficiency of adaptation options through simulations - A new generation of urban planning tools. Journal of Hydrology, 550, 355-367. Doi: 10.1016/j.jhydrol.2017.05.009