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Supporting communities in reducing their vulnerability against impacts of short-term heavy precipitation events

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Potential flood areas are known and charted for most large and many small rivers in Europe. However, often no appropriate knowledge exists about the impacts of short-term intense precipitation (of mostly convective origin, occurring predominantly during the warm season) on small tributaries or on areas aside from waterways. Communities are often not sensitised and prepared for the massive surface runoff and subsequent flooding following massive downpours. Risks are particularly large in valley locations, where the water is canalised and immense flash floods may occur. Yet, each event has a different impact. Crucial factors determining these impacts are soil type, pre-event soil moisture, surface sealing, vegetation structure, slope gradients and many others.

This contribution presents a framework to empower local communities – located within the central-German county of Hesse – to reduce their vulnerability against short-term intense precipitation events. The project consists of a data analysis part, in which information on observed heavy precipitation, (water related) disaster management actions of the local fire brigades, erosion risk maps, and further aspects are mapped to an integrated county-wide "heavy precipitation reference map" (german: "Starkregenhinweiskarte").

Another part of the project deals with the usability issue of heavy precipitation data in hydrological engineering. The goal of this part is to improve the use of the best available data and methods to assess – in very high resolution – areas at risk of flooding in case of such an event. This project part will culminate in exemplary "heavy precipitation hazard risk maps" (german: "Starkregengefahrenkarte") for two local communities in Hesse.

In this presentation we will focus on ways how to communicate highly complex subject-specific scientific results of different sources to public decision makers in mostly small to medium-sized communities. Concrete challenges are to efficiently a) increase the awareness of the existing vulnerability to heavy precipitation events within the municipalities, b) convey the benefits of precaution measures, c) point out existing local deficiencies in disaster control and precaution measures and d) demonstrate opportunities to resolve them.