



Pluvial flash flooding in rural areas - modelling and assessment of climate change impacts

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The assessment of risks associated to pluvial flash flooding has gained increasing importance during the last years. Awareness to this flood risk increased especially in the pre-alpine areas increased as numerous rural and urbanized areas were subjected to flooding although being located away from permanent water courses. Local heavy precipitation events are the main trigger for that type of flooding. Still, topographical features, changes in runoff generation behaviour, land use (change) impact the resulting flood risk.

A coupled hydrological and two-dimensional hydrodynamic model is used to simulate the spatial distribution and of surface runoff and flood generation. The parameterization of models is supported by artificial rainfall test conducted in the test catchments. Based on that data, impacts and uncertainties of varying land uses are quantified. Beyond that, a sensitivity assessment of critical initial condition for local flash floods generation is made. In the investigations, past events and design rainfall approaches are used to calibrate the models used. Further, inputs were adapted to represent future input conditions covering climate change. Thereby the recurrence of flood risks under current and future (climate change) conditions are investigated using real and design events.

Altering of the pluvial flash flood risk as such involves as well the altering of the design of measures to reduce flood risks. Enabling the implementation of adequate and lasting adaptation measures to cope with flash floods requires assessing the risks not only for the present but also for the climate changed future. Simulations, flood risk assessment and uncertainties are discussed at several case studies in Upper Austria. The results for single pilot regions are presented and analysed, towards the development of a standardized way for local flash flood assessment.