



Assessing current and future exposure to flood hazards – proceedings of the project RiskAdapt

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The project RiskAdapt, funded by the Climate and Energy Fund Austria, applies a novel dynamic flood risk assessment approach. It analyses both aspects of risk – hazard and vulnerability – and considers their potential spatial and temporal developments under climate change scenarios on a macro scale (federal territory of Austria) and a micro scale (regional/local case studies). The conceptual framework of RiskAdapt integrates analytical perspectives of hazard and vulnerability, the latter comprising the analysis of exposure, sensitivity and adaptive capacities.

In the framework of the macro scale risk assessment, a nationwide GIS based analysis of current hazard exposure is conducted based on the indicators “affected persons” and “traffic infrastructure” (roads and railroads) in calculated flooding areas. Provided by the Environment Agency Austria (UBA) for 500m river stretches, these indicators are evaluated for each municipality in Austria. To assess their future exposure to flood hazards, demographic and land-use change scenarios (timeframe: 2030) are established based on existing projections and available data suitable for extrapolation. Regarding population change, extrapolations of local demographic developments are correlated with regional forecasts provided by the Austrian Conference on Spatial Planning (ÖROK). Land-use change scenarios are established by extrapolating trends in the development of highly vulnerable land uses (including building land for housing, commercial and industrial purposes as well as land used for traffic infrastructure). Data on highly vulnerable land uses is available for the years 2001, 2003, 2005 and 2012 for each municipality of Austria (provided by UBA).

Based on this analysis, municipalities will be clustered according to the present and expected degree of exposure. This simplified approach in exposure assessment contains uncertainties, in particular with regard to demographic and land-use change scenarios:

-) While population growth usually leads to an increase in built up land, basing settlement scenarios on population developments/forecasts does not take into account housing densities and usage of existing buildings. Furthermore, demographic scenarios reflect the growth in industrial and commercial land uses only to a certain extent;
-) Growth of highly vulnerable land uses does not automatically imply an increase in vulnerability to flood hazards. This is essentially determined by the location and the direction of future land use developments.

These uncertainties cannot be taken into account in the nationwide exposure assessment. However, in order to reflect these uncertainties and their effects on the vulnerability assessments and to evaluate the influence of spatial planning on vulnerability reduction, additional research will be conducted in three local and/or regional case studies. Exposure information from the nationwide exposure assessment will be completed and refined by integrating detailed land-use information and demographic data (derived from document analyses of spatial planning instruments, (retrospective) analyses of orthophotos and expert interviews with regional and local stakeholders.