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Detailed residual risk assessment in an Austrian municipality

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Since the implementation of the EU Flood Directive requires the development of flood risk maps until 2013 the development, application, harmonisation and improvement of assessment methodologies becomes a major task.

The objective of this study was to demonstrate the elaboration of potential damage functions for different land uses in an Austrian municipality. Along the local river a flood protection system designed to resist a 100 years flood has been implemented. Subsequently the former flood prone area was intensively developed by both industrial firms and by extending the residential areas. As a consequence the damage potential was substantially increased. To analyse possible flood damages different scenarios were developed which relate to normative considerations, failure of mitigation measures, influence of hydraulic structures and natural processes like logjam, vegetation and sediment transport. On the basis of a coupled 1D-2D hydraulic model the exposure of buildings was appraised. To estimate economic losses the BUWAL approach, a three-stage-procedure with increasing order of analytical depth, was tested with special respect to the assessment of economic values and added value losses. Ex-ante damage functions referring to approximately 400 single objects like residential houses and local small trade were derived by mapping. To improve the quantification of monetary terms related to local manufacturing companies, oral interviews were organised supplemented by a detailed questionnaire. An estimate of the overall damage potential was made by assigning the damage functions to the inundation depths calculated for the worst case scenario. Moreover a detriment was estimated by linking all scenario associated damages with their preassigned probabilities.

The case study proved the applicability of the methodology. Furthermore the importance of risk awareness and participation of potentially affected inhabitants and companies was clearly identified. Additionally a refinement of existing data sets concerning economic values and added value losses was achieved.