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SEDEX – a practical method to estimate sediment delivery in mountain torrents

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SEDEX, derived from SEDiments and EXperts, is a project with the aim of designing a practical tool for the assessment of mountain torrents. It concentrates on the estimation of sediment deliveries for certain recurrence periods and has to be linked with other assessment methods such as the description of the general characteristics of the torrent, runoff conditions and records of historic events. The requirements of SEDEX being viable implies that it can be applied to a catchment within a short time, which means it has to be a handy and very efficient tool.

SEDEX consists of four different products. A concise field manual consists of all the necessary information and checklists for the field work. The more detailed version of the manual serves as a reference book with specified instructions. An important element is also the PDA-program provided to ensure consistent field data and to save time in the analysis of the delivered sediment yield. Additionally a desktop version of the program generates graphics and tables to summarize and overview the results. All the products offer different levels of details so that different target audiences - from experienced experts to beginners such as students – feel comfortable using it.

The procedure to assess a torrent according to SEDEX is based on the fragmentation of a mountain torrent into units with defined characteristics. In the field, channel, embankments and slopes are divided into relatively homogeneous sections. These so-called units are then evaluated step by step by assigning them a type of process, a degree of activity and an estimated sediment delivery. The results of the analysis of every single unit are merged and used for the assessment of the overall potential sediment

delivery in the torrent. Furthermore the type and amount of occurring units in a torrent reveal information about the general characteristics of a torrent as well as the possible courses of event. SEDEX also offers a procedure to judge the effect between neighbouring and distant units. This allows a check whether or not a significantly different scenario than the basic one suggested has to be considered in the hazard assessment.

For the development of the SEDEX it was regarded as essential that it was constantly reviewed by experts from practice, administration and science as well as by students. The criticisms and suggestions of these workshops, test runs and case studies were currently integrated into SEDEX.

The consulted experts confirmed that using SEDEX enhances the quality and efficiency of an assessment. The visualisation of the results and the simple overviews were regarded as being beneficial for the expert, as well as for the communication of the results to the client of the assignment. In particular for the continuation of projects (e.g. the design of counter measures) it's a deciding point whether the results and their existing uncertainties are comprehensibly displayed. Furthermore the traceability and the transparency of the results were rated as advantages. Firstly because SEDEX improves the comparability of reports from different experts. Secondly because it increases homogeneity within a single assessment by forcing a very consistent documentation for instance with the data input into the PDA-program.