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A conceptual planning tool for mountain hazard and risk management

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Following the premises of integral risk management, comprehensive mitigation concepts have to be elaborated in a structured manner aiming to fulfil the requirements of effectiveness and efficiency. In order to achieve the optimal protection level against hazard processes, the planning process has to follow distinct guidelines that allow for a consistent management process. Thereby, the necessities of efficient risk reduction have to meet other commensurate requirements, such as ecological sustainability, technical reliability, feasibility of the concept itself even under changing system loadings, as well as an adapted maintenance strategy. Until now, only little work has been done to conceptualise such necessities from an integrative point of view. So far, most of the engineering strategies aimed either at maximising the hydraulic discharge capacity or the bed load retention, or at consolidating the streambed and limit the rate of bedload production. To overcome these shortcomings we propose a revision of the underlying planning process by means of a step-by-step approach. This approach will gear functionally efficient mitigation measures that are able to provide a higher degree of risk reduction than conventional mitigation strategies by including possible alternatives already in the early planning stages.