



A failure propensity indicator for check dams based neural network techniques supported by expert elicitations

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In Alpine Regions where natural hazard events are frequent and the consequent damages on buildings, industry, infrastructure and agriculture are consistent, the maintenance of an efficient protection system, based traditionally on active measures, but also on more and more reliable passive instruments like hazard zoning and emergency planning, is becoming a major task. Crucial in this framework is to have a profound knowledge on the position of the check and consolidation dams, about their condition or failure propensity and about their efficiency as an embedded component in a torrent control protection system. The department of hydraulic engineering has started facing this complex problem since the year 1998 building up systematic event documentation, pursuing with the now near to 100% complete protection work register, providing recently hazard indication maps and testing different approaches on the determination of the reliability of the protection measures. In this work a failure propensity indicator for check and consolidation dams, that widely uses neural network techniques and that has been trained processing the information deriving from expert elicitations, is proposed. It tries to overcome the shortcomings of point rating system based failure propensity estimation and to cover the necessities of forward oriented maintenance planning. The quality of the failure propensity predictions depend also on the expert elicitation method, the selected check and consolidation dams for the expert analysis and the survey method applied for retrieving the significant parameters describe the condition of the dams. Referring to this last point ad hoc data collection forms have been developed. Taking into consideration that similar issues on the reliability of tor-

rent control protection systems concern torrent control agencies in all Alpine Regions countries the present work could represent a valuable contribution for further common developments.