

ROCK-FALL RATING SYSTEMS:

IS THERE A COMPREHENSIVE METHOD FOR HAZARD ZONING ?

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INTRODUCTION

Rock-fall hazards in alpine regions pose a significant threat to settlements and infrastructure. The current code of practice for the assessment of rock-fall hazards in the hazard zoning of the “*Torrent and Avalanche Control Austria*” as a public service determines potential run-out zones of rock-falls as an indication zone. Therefore these zones are not determined mandatory and incorporate neither detailed assessment of the potential detachment zone nor a comprehensive evaluation of the rock-fall-process itself.

Due to the increasing pressure of spreading residential areas in the sparse space for permanent settlements in alpine regions, a further development of appropriate evaluation tools is discussed. Due to the extended area that is subject to hazard zoning, a comprehensive evaluation of all the potential rock-fall detachment areas is not feasible with the resources at hand at the service of the “*Torrent and Avalanche Control Austria*”.

Nevertheless the establishment of a standard (best practice) is considered to be important to provide the authorities involved in the land-use planning with specifications for additional investigations to be prescribed. For the region of Tyrol a recommendation for the regional authority was provided by the “*Torrent and Avalanche Control Austria*” in 2005. In consideration of the constant further development of tools and methods to evaluate rock-fall hazards the update of a best practice approach seems to be essential.

METHODS

Most existing rock fall rating systems focus on the evaluation of rock fall risk being relevant for linear structures such as railways, roads or pipelines where often good data regarding the rock fall frequency is available. For land use planning and rather young settlements such data is very often not existent and therefore the evaluation of risk has to be based on a frequency estimation derived from an assessment of the rock faces present on the slope and/or the subsequent accumulations of blocks on the slope. This leads to the necessity to develop a rating system that takes this situation into account. With such a rating system a tool could be provided to evaluate the endangerment of settlements or infrastructure due to potential rock fall events even without a significant history in such events. With this procedure state of the art methods can be established for land use planning, hazard zoning and planning of mitigation measures.

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GOALS

The article aims to an evaluation of existing rock-fall rating systems and their adoption to a comprehensive tool to provide concise information for

- hazard-zoning,
- land-use planning,
- investment decisions regarding risk mitigation measures and
- the assessment of the necessity of further evaluations in case of detected threads.

Further on a recommendation regarding the extent and appropriate methods (state of the art) of these assessments and evaluations is given.

Keywords: rock-fall rating, hazard mapping, hazard zoning