

## ***Interactive comment on “Regional-scale analysis of high-mountain multi-hazard and risk in the Pamir (Tajikistan) with GRASS GIS” by F. E. Gruber and M. Mergili***

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We would like to thank both reviewers for their critics and suggestions which will certainly help to improve the quality of the manuscript. We will comment on all details of the reviews in the response provided along with the revised manuscript, here we address the – in our view – most critical points:

1. Both referees agree that there are too much figures in the manuscript, particularly with regard to the logical frameworks of each module. We fully accept the suggestion to reduce the number of figures. We will simplify the figures with the logical frameworks

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of each module and condense them into one figure.

2. Referee 2 criticizes the use of the terms hazard and risk. The authors are fully aware that the output of the research presented are NO hazard and risk maps as a lot of detailed information required to produce such maps are missing. Therefore, already in the discussion paper, we use the terms hazard INDICATION maps and risk INDICATION maps. However, we will try to point out this limitation and this character of the results even more clearly in the revised manuscript and carefully check for a consistent and appropriate terminology throughout the paper. Further, we would be grateful for any suggestions of better terms to use – to our knowledge, hazard and risk INDICATION is the most appropriate solution.

3. Referee 2 further criticizes the neglect of linear structures such as roads. The authors fully agree that the hazard and risk with regard to such structures is a highly important aspect. The reason for not considering them is, on the one hand, the background of the research. It is part of a development cooperation project focused on community-based hazard and risk assessment, where settlements and farmland are the major focus rather than roads. On the other hand, a considerable amount of additional work would be necessary to define appropriate sections of roads and to assign an appropriate exposure class to each road section in order to discretize the risk indication scores for the (linear) road sections in a way comparable to the (polygon-shaped) villages. Therefore we consider roads and other linear structures out of scope of the present work, but the topic of possible future work. This will be clearly expressed in the discussion of the revised manuscript.

4. Referee 2 also comments on the rather weak validation with observed events. This is indeed a problem, but we have to consider that the paper deals with high-mountain hazards of partly low frequency and remote location, so that it is hard – or even impossible – to build a sound database allowing the use of statistical methods or a quantitative evaluation with observed events. Therefore we use, as far as possible, rules derived from events observed in the study area as well as in other mountain areas of the world.

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In our opinion, this is the only possibility to work at this scale in such an area. However, as we are talking about hazard and risk INDICATION maps at a very broad scale, we consider this acceptable. We acknowledge that the uncertainties are considerable. Therefore we stress in the discussion that the interpretation of the map at a detailed level is not appropriate. In the revised manuscript we will try to emphasize this aspect even more strongly.

Due to absence of the authors until September 9, and in order to have sufficient time to carefully consider all the remarks in the revision, we request to set the deadline for resubmission to not earlier than September 30.

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