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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Brief communication: Roads and landslides in Nepal: How development affects risk" *by* Brian G. McAdoo et al.

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Response to Editor

We have agreed with the editor that this paper should be submitted as a full paper rather than a brief communication. As such, the paper is largely rewritten, and many of the comments are addressed in the expanded version. Below, we will endeavour to address the comments, but perhaps less with specifics (line-by-line) and more with the big picture.

Point 1- Further explanation of data and Monte Carlo. We have added a more detailed description of each. The description of the landslides was done by our Nepali co-author (KRG) using a method that was very similar to that described in detail by Roback et al.

As we have not seen the Monte Carlo method that we used in this paper described in the literature, we have tried to describe it in sufficient detail for it to be repeatable, but not so much detail so that it drowns the results.

Point 2- The analysis of the results is complicated by the fact that this is not a pure hazards paper. Instead, we seek to see how the hazards affect people and, critically, vice-versa. In this particular case, it is not possible to divorce the two. The analysis we seek to complete is not so much about understanding the mechanics of the hazard, but rather the effect the increased hazards have on exposed communities. As such, the distribution with topography (did it occur on a steep slope? Was it at the bottom or top of the slope?) is less important than the fact that wherever the communities are that built these roads are located, they still built the roads and are therefore by their sheer existence, tied to the associated hazards. If this were a paper that focused on the distribution of slides, amount of additional sediment delivered to streams, etc., we would agree that the relationship with topography would be key to predictability.

Other, big picture changes. With more space, you will notice that we decided to add a figure at the beginning (Fig. 1) that shows what this actually looks like in the field, along with a schematic that shows the different modes of failure, and a couple examples of two of those modes. As far as we are aware, this simple schematic has not been done previously.

We have cleaned up Fig. 2 with landmarks (towns, river names) based on suggestions by the reviewers, and made the inset (Fig. 2b) slightly less psychedelic looking (purple to grey).

The new Fig. 3 now shows both the cumulative and incremental number of slides at given distances from the road. This has the benefit of clearly showing that the main driver of the discrepancy is the number of monsoon-triggered slides that are within 50 m of a road, clearly demonstrating the genetic relationship.

We have added a Fig. 4 that shows the relationship between road construction, the

increase in Foreign Direct Investment following the end of the Maoist insurrection, and associated landslide deaths. This shows how if the trend of increased road construction is magnified by the Belt and Road Initiative, the upward trend of landslide deaths is also likely to increase.

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