

## ***Interactive comment on “How size and trigger matter: analyzing rainfall- and earthquake-triggered landslide inventories and their causal relation in the Koshi River basin, Central Himalaya” by Jianqiang Zhang et al.***

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Zhang et al. present a study in which they analyse rainfall- and earthquake-triggered landslide inventories to seek similarities, differences and correlations in regards of their frequency-area distributions, size ranges, controlling factors, and ultimately their susceptibility assessments. I find this study very interesting as it constitutes a systematic and practical-oriented regional-scale analysis of landslide patterns with recognized different triggers. I believe this study can promote further investigations by the scientific community in earthquake-prone mountainous areas for which detailed inventories are

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available, which may confirm some of the authors' general observations and at the same time highlight some region-specific patterns.

I have just some observations and suggestions regarding some parts of the methodology, which are detailed below:

line 145 - I understand that the inventories were made through visual interpretation. It would be good if the authors specify this here rather than at line 150 (which refers only to the most recent images). Furthermore, it would be good to specify if and how the authors evaluated the mapping uncertainties due to low imagery resolution and visual interpretation, for instance in terms of shape and size mismatch and amalgamation, and their propagation to landslide statistics (e.g. frequency-area distributions, classification by controlling factors).

line 168 - Also here, it would be good to specify how the rather low spatial resolution of the DEM (30x30 m) affects the classification especially of landslides with small area (as low as 50 sq.m).

line 176 - Here it would be nice to explain the 60%-40% choice (is it because of the sample size? is it arbitrary?) and to specify how the landslides are assigned to either set (e.g. randomly, but being sure that the size distribution and controlling factors classification are the same in both sets?).

line 216 - Here you classify the landslides into small and large depending on "field experience" and on the basis of the frequency-area distributions. You choose 6000 m<sup>2</sup> as your threshold which is more or less the cut-off value in the frequency-area distribution of the earthquake-triggered landslides but is much smaller than that of the rainfall-triggered landslides. However, the cut-off (or rollover point) may be affected by undersampling of small landslides, which you should be able to rule out explicitly. Also, what field experience means in this context remains unclear. So, this threshold area seems quite arbitrary. I would encourage the authors to introduce a physically-based justification for this choice, which you did in part already in the introduction. On the

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other hand, I would also suggest that you run your model multiple times with different thresholds, to show if there is an optimal (data-driven) threshold that can best differentiate the statistics of RTL and ETL in your study area. This threshold will certainly have a hidden physical meaning, which could be then discussed.

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