

Interactive comment on “Why the 2014 Ludian, Yunnan, China M_s 6.5 earthquake triggered an unusually large landslide?” by Z. F. Chang et al.

Anonymous Referee #2

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This paper is a descriptive paper of a large landslide triggered by an earthquake. The first issue I want to draw attention to is the way conditions that preconditioned the slope to failure and the triggering event are not separated. The preconditioning factors include the active seismicity of the area, topographic relief and stream incision and rock mass defects and properties. The implication in the text is that these are all recent developments.

As the area is on the edge of the Tibetan Plateau, I can only assume the river valley was glaciated at some point and that glacial retreat exposed the slope to fluvial and other erosion processes. How long ago did this occur? I am guessing it was some 10-15 thousand years ago.

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Next, what is the seismic hazard for the area - how many times in the last 10-15 thousand years has the slope likely experienced shaking similar to that of the triggering earthquake?

The paper in section 5 implies the slope went from a pristine condition to collapse during this earthquake and does not consider that the slope may have been progressively weakened during previous earthquakes, with this earthquake triggering collapse of a slope that had been progressively weakened by previous events.

If the authors want to demonstrate that the failure is entirely due to the most recent earthquake they need to demonstrate that the probabilistic seismic hazard for the area is either very low (making this earthquake a very rare event) or that the incision and exposure of the beds has been very rapid.

It is my opinion the paper needs a major rewrite to include information on the glacial history and/or valley incision rates AND information on the probabilistic seismic hazard for the region. Evidence is needed to back the authors assumption that the slope that failed went from pristine to collapse during a single earthquake event.

The following paper provides some discussion of these points
<http://www.sciencedirect.com/science/article/pii/S0277379113005027>

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