



Interactive
Comment

Interactive comment on “Epic landslide erosion from mountain roads in Yunnan, China – challenges for sustainable development” by R. C. Sidle et al.

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We fully appreciate the importance of climate, especially short-term rainfall, as a trigger mechanism for landslides in both disturbed and natural terrain in this and other mountainous regions. However, without the benefit of short-term rainfall intensity data, it is impossible to draw meaningful linkages between rainfall characteristics and landslide initiation. We examined in detail the very recent paper by Ma et al. (2014) that the reviewer referred to, and even these authors who had much more open access to meteorological data in Yunnan compared to our group, did not report intensity data – in fact they stated that the rainfall data in their study site was uncertain with inade-

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quate spatial coverage, in spite of only using daily rainfall amounts. We have added reference to the Ma et al., 2014 paper in both the second and third paragraphs of the Introduction to acknowledge this new work and their main findings. However, there is very little we can do regarding rainfall analysis that would be meaningful for our road-landslide study. The short-term rainfall intensity data are simply not available and any reference to climate change would be purely speculative. In the Ma et al., 2014 paper, there were no rainfall data that would be meaningful for landslide assessment and these researchers obviously had access to records that are unavailable to non-Chinese researchers. They also showed that the most direct link to rainfall that they reported (peak flows) had very weak correlation to any climate change. As such, it would be impossible for us to piece together a credible narrative of how climate change, rain intensity, vegetation cover change and road building would interact together - it is a nice idea, but the data are simply not there and even though portions of the Ma et al. (2014) paper imply that they analysed these interactions, they used a model (SWAT) that does not consider landslides and the shorter term climate data needed to assess landslide initiation.

The importance of rooting strength is a topic all of us have worked on extensively; however, this does not affect road-related landslides until after deep-rooted woody vegetation has been established. The landslides along roads that we measured had virtually no established vegetation within the 'footprint' of the road. In response to this comment, we added a sentence and reference related to the need to consider planting deep rooted woody vegetation on road fills to enhance long-term stability in the second paragraph of section 4.3.

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