

Interactive comment on “Quantifying lahar damage using numerical modelling” by S. R. Mead et al.

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We would like to thank the reviewer for their time spent in providing a detailed and constructive review of our manuscript, the comments will result in a considerably improved manuscript. We appreciate (and agree) with comments that the results and approach presented would be interesting to the public of the journal and concede that some assumptions were not clearly identified and discussed in our attempt to improve on this field of research. The authors believe this work is important in its demonstration of an approach to estimate damage (or, as pointed out ‘conditions under which damage occurs’) where data may be lacking. Out of necessity, this requires use of ‘a patchwork of data’ and extrapolation from other contexts.

We have developed a plan to address your broad comments on the number and con-

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nectivity of aspects (engineering, rheology and modelling), defining key terms, possible simplifications and the need for a critical and comprehensive discussion on the limitations and assumptions of this work. Revision of the manuscript is ongoing; a list of major changes needed to address the comments as well as a response to all specific comments are provided in the attached document.

Broadly, we have reduced the amount of technical detail by moving a large section of the building vulnerability work to an appendix and greatly reduced the size of lahar modelling sections by removing unnecessary details. We have added a 'limitations' subsection to the discussion section which critically evaluates and justifies assumptions used in this work. The purpose of the manuscript has been clarified ("...investigate the effect of hazard (flow rate and rheology), exposure (building orientation) and vulnerability (building quality/type) components on building loss in Arequipa."), readability has been improved through ensuring consistency and clarity of key terms and we will expand the introduction to explain all aspects of the work and how they are connected to the main aim.

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-282/nhess-2016-282-AC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-282, 2016.

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