

## ***Interactive comment on “Experimental study of embankment breach based on its construction parameters” by Sachin Dhiman and Kanhu Charan Patra***

### **Anonymous Referee #1**

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#### GENERAL COMMENTS

The authors present basic observations of the rates of erosion, time to breach, and observed outflows resulting from the breach of cohesive embankments constructed with different compaction conditions and post-construction moisture conditioning (drying). The Phase I studies that varied compaction effort and moisture at time of compaction do not add significantly to previously literature that has studied these same variables (e.g., several papers of Hanson, Hunt). Furthermore, the data are presented in ways that do not facilitate comparisons, since moisture contents are expressed throughout the paper as ratios to optimum conditions, not as differences from optimum, which

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are typical in the field of embankment dam engineering. Efforts to relate these tests to measures for predicting erosion rates (JET erosion testing, estimating of erosion rate coefficients from compaction and moisture conditions, modeling with tools such as WinDAM or other breach models) would greatly improve the value of the paper, especially for these Phase 1 tests that are relatively similar to work that has already been done by others.

The Phase 2 studies in which cracks were allowed to develop in the dams are a new contribution to the literature, as these desiccation cracks have not been studied by others to my knowledge. While the authors give basic information about percentage changes in breach time and outflow, the actual mechanisms of erosion development in cracks and the role of cracks in accelerating the headcut and breach development process are not given much focus.

Overall, the paper is written in very fractured English and is difficult to read and understand in many passages.

#### SPECIFIC COMMENTS

Embankment heights are reported inconsistently throughout the paper. Values of 0.3 m, 0.5 m, and 0.6 m appear in various places. Some tests are characterized as small scale and others as large scale, despite apparently small differences in embankment height.

#### TECHNICAL CORRECTIONS

The works of Hanson should be more fully described. They were lab tests of constructed embankments, not studies of real dam failures. The text gives so little information that a reader could easily infer the latter.

Page 4, lines 20-23 talk of two “crucial scenarios”, one in which stored reservoir water is not contributing to outflow, a second in which stored water is released through the breach. However, what follows does not describe two scenarios, but three phases

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that seem to apply to all of the tests. The two “crucial scenarios” seem to never be mentioned again, suggesting that they were not so crucial. This is disturbing for the reader who feels they have missed an important point.

Units for the dimensions of the tamper equipment are not given.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2017-383>, 2017.