Natural Hazards
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Discussions

Interactive comment on "Laboratory experiments on rainfall-induced flowslide from pore pressure and moisture content measurements" *by* M. R. Hakro and I. S. H. Harahap

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We would like to thank the reviewer for their valuable suggestion, and taking this on positive side this would be helpful for improving the quality of manuscript.

1. It is not clear what are the major contributions of this paper, please modify the Abstract, Introduction, and Conclusion to make them clear.

We will modify the abstract, introduction and conclusion to more clear the contribution of the paper. The major contribution of the paper include the parameters that controls the initiation of flowslide type of the failure. So far that parameters such as density,

thickness, rainfall intensity and initial moisture conditions were changed during the experiments. From number of experiments it was observed that density of soil slope is the most important factor that controls the initiation of flowslide. As in the case high density soil slope the flowslide or major failure not observed, however in case loose soil slope suffers from flowslide type of failure. 2. It is not clear what is the definition of "flowslide" and how the authors confirm they properly produce the "flowslide" in the lab.

The definition of flowslide may be referred as " the movement in the granular type of soil termed as flowslide [1]. Flowslides are slope failures that are characterized by general disintegration of the sliding mass, with a rise in pore water pressure, and by development of fluid-like motion [2]. Flowslide can be distinguished from slides, which have a relatively intact soil mass above the sliding surface [3]. With reference to above definitions and literature review the failure during the experiments clearly resembles to flowslide type of failure, as sudden failure occurred with high velocity in experiments.

3. The setups of the experiment is short of descriptions. For example, it is not clear where the authors install the sensors (Fig.1 need to be modified), it is not clear what are the soil and how to place it in the flume, and it is not clear how the flowslide was produced.

In the final revised manuscript we will modify the figures so that can best shows the location of the sensors. Regarding the soil placement during the experiments, as before starting of the experiments the soil placed in flume in layers with depth of each layer not more the 5-10 cm and each layer of soil compacted with fabricated hammer having weight of 5 kg in case of high density, However for loose slope whole soil placed in the flume and slightly compacted so that surface of slope becomes equal. For produced flowslide please refer to reply of second comment.

4. About the results, it is short of theoretical analysis and detailed discussions, which make the paper short of major contributions.

In the revised paper we will further increase the theoretical analysis and detailed discussion regarding the failure modes as observed during the experiment, pore pressure and moisture content variations. Thereby the paper will show the major contributions of the study.

5. English editing service is necessary to make this paper more readable. For example, there are grammar errors and long sentences in the Abstract, and there are too many short paragraphs in the Related Past Work.

Before submission of revised version of the manuscript a native English speaker will edit the manuscript to set the grammatical errors. As for too many short paragraphs we will critical review that the past related work and reduce the number of paragraphs.

6. About the experiments, a table of the sensors with their accuracy, and a procedure of the experiment are necessary.

All the sensors before the experiments calibrated, as after the preparation of model slopes the sensors placed at the different locations. Before installation of sensors the holes were drilled and sensors placed and after that holes filled with removed soil and compacted with rubber hammer thereby avoiding the damages to sensors. The accuracy of moisture sensors as described below Temperature range for Imko Trime Pico 32 is -15°C to 50°C.

For calibration of moisture sensors please refer to Table 1

The piezometers can measure the pore pressure from 0 to 100 kPa, with maximum error in reading F.S = 0.26436.

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Table 1. Imko Trime-Pico 32 Calibration (Source; Surechem Marketing Sdn Bhd)

conductivity range:	0..6dS/m	6..12dS/m	12..50dS/m
Moisture range 0..40%:	±1%	±2%	
Moisture range 40..70%:	±2%	±3%	with material specific calibration
Repeating accuracy:	±0.2%	±0.3%	

Fig. 1.