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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Potential Impact of Climate Change and Extreme Events on Slope Land Hazard – A Case Study of Xindian Watershed in Taiwan" *by* Shih-Chao Wei et al.

Anonymous Referee #1

Received and published: 6 July 2018

This manuscript proposed the scenario approach coupled with landslide simulation, debris flow simulation and loss assessment. The reviewer believes that the approach to link the landslide simulation with debris flow simulation as well as loss assessment was unique and interesting but the manuscript should be improved to be published.

1. In some parts of the manuscript, the sentences used by the authors are unclear. The authors are advised to rephrase these sentences in a better way or proof reading by English native speaker. One example is the sentence on Lines 9 to 13 of page 2.

2. In line 7 of page 2, the authors mentioned that "some potential effects of landslides have been investigated by studying the differences between current and future scenar-

ios". However, any detailed explanation about the potential effects was not provided, so the reviewer cannot understand the explanation.

3. In line 14 – 15 of page 2, the authors explained that the accumulated rainfall over a period of 3, 6, 12 hours exceeded the 200 year record. However, the authors did not provide exact rainfall amounts. To understand the climate condition of Taipei area, total amount of rainfall accumulations for 3, 6, 12 hour periods should be provided.

4. In line 13 of page 4, "The TRIGRS is an inventory of shallow landslide simulation programs developed . . ..". But the TRIGRAS is not an inventory. Inventory means that the collection of past landslide features in a certain area for a certain period.

5. Does the subtitle "Landslide Inventory Simulation" mean that the location of past landslides (That is, landslide inventory) were simulated and matched by TRIGRS? However, it does not seem that the analysis results of TRIGRS are matched to the location of past landslides in this manuscript. In this case, the term "landslide inventory simulation" should be revised.

6. In Fig. 3, the authors provided historical landslide area. The reviewer recommends to provide more detailed information about how the inventory was constructed and the landslide locations were obtained.

7. In 3.3, the soil parameters such as cohesion, friction angle, unit weight, hydraulic conductivity, and diffusivity were used as input values in landslide analysis using TRIGRS. However, any values for the soil parameters were not provided. Since the input parameters in TRIGRS are important, the values of the input parameters should be provided. In addition, since the soil thickness is also an important parameter affecting the simulation results, the detailed procedure to evaluate the soil thickness using slope-depth relationship should be explained.

8. The explanations in line 11 – 14 of page 13 is not clear. The reviewer cannot understand why and how calibration zones were reduced from 90 to 56. Please rewrite

the paragraph clearly.

9. In line 7 – 8 of page 14, “Based on the landslide simulation results and soil thickness in each grid, the landslide inventory map were drawn, as depicted in Fig. 8, . . .”. In reviewer’s opinion, Fig. 8 is not landslide inventory but landslide analysis results. In addition, the author should provide clear explanation that the procedure that the authors performed and the results in Fig. 8 that the authors obtained. Since the most analysis results using TRIGRS show the distribution of factor of safety, the reviewer cannot understand the reason that Fig. 8 shows the soil depth as the results of analysis. Were the soil depths in Fig. 8 used in debris flow simulation? In the manuscript, any explanations were not provided.

10. In line 7 – 11 of page 15, the reason that the concentration was presumed to be high and a maxima was used for the practical estimations should be explained. In addition, the meaning of the sentence “the beginning of debris flow was assumed to be the same as the starting time.” is not clear.

11. In 4.2, the authors provides the calculation results of the possible economic losses using the quantified method in Table 1. However, the authors did not provide any values used in the calculations and the calculation procedures that the authors performed. The detailed information should be provided.

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