Natural Hazards
and Earth System
Sciences

Open Access

EGU

Discussions

*Interactive comment on* "Quantitative assessment of rainfall-induced landslide susceptibility in new urban area of Fengjie County, Three Gorges area, China" *by* Haijia Wen et al.

**Anonymous Referee #1**

Received and published: 10 May 2017

Comments about the manuscript 'Quantitative assessment of rainfall-induced landslide susceptibility in new urban area of Fengjie County, Three Gorges area, China' :

General comments:

The paper uses large quantity of data to assess regional bank landslide susceptibility in Fengjie town of Three-Gorges Reservoir area. Authors made great efforts trying to analyze, re-group different kinds of parameters which are necessary for a quantitative analysis. Meanwhile, validation of predicted results is conducted according to thorough field landslide investigation and recorded events of landslides in the past years. Maps are beautiful. Data are rich. All efforts from the authors are encouraged. But unfortunately, the paper failed to some major issues.

1. What is the author's real point of view on the influencing factor of reservoir water level? The title of the paper is focused on the analysis of rainfall-induced landslides, but for regional susceptibility mapping, the paper ignored the influencing factor of reservoir water level fluctuation only based on the simple explanation in Page 5 line 10-15. In fact, the authors hold an opposite point of view from page 7 lines 35-36, page 8 lines 1-2, which demonstrate the action of reservoir water level. So, what is the real author's recognition on the factor of reservoir water fluctuation? It seems to be a contradiction.

2. Data source and processing are not adequate. For quantitative assessment of landslide susceptibility, data is essential even the data source is always very difficult in a regional scale. Nevertheless, it is not tolerable in the paper that there are some unreasonable parameters considering the real soil/rock properties which significantly affect the reliability of calculation. Questions to table 1. (1) h, slope height, ranges 8-14.9? Normally, a natural slope is much higher as hundreds meters. But, in table 4 the selected range of h is higher than 100m. (2) c, cohesion, is presented in MPa which generally means a contact rock material not a soil? How this high cohesion is in relation to the shallow soil slope failures? (3)ÏŠ, weight, minimum is 13.7KN/m3, what kind of soil is it? The reviewer thinks the proper data source and processing are the first issue to ensure the reliability of the analysis.

3. Quantitative calculation of FS in ASD seems not to be realistic. Questions on FS in table 2. From the reviewer's experience in FS calculation of safety factor, FS = 0.38 of group 15 slope is calculated with parameters of friction angle 34.14, cohesion 86.28 Mpa, and 8.37 mm/day of rainfall. Is it corrected? But FS = 4.07 of group 9 slope is calculated with parameters of friction angle 5.31, cohesion 93.14 Mpa, and 29.30 mm/day of rainfall? These two FS values made me confused. Comparing to all FS values in Table 2, how to evaluate the reliability of FS? The reviewer thinks the training samples are the core for later susceptibility analysis. Please re-check your data source and your calculation.

Specific questions:

4. Are the key words present the key points of the paper? It should be re-considered? 5. Page 2 lines 43-44, "however, few landslides inventory maps...". In fact, very detailed landslide inventories, geological exploration, even many slope stabilization engineering have been already completed which is organized by central government. 6. Page 3 line 2, "hence the landslides events in the past may not be a good indication to implement landslide assessment". This statement is not geologically correct. The past is a good indication for future, especially for regional susceptibility mapping. We always use the inventory maps and recorded events as the data source which demonstrated the importance of the past. 7. Page 4 line 42, "the dynamic factors are usually rainfall and earthquake". Reservoir water level variation is certainly an important dynamic factor which affects the bank slope in this paper. Reservoir water level plays two key roles to destabilize the bank slope: soften soil/rock properties and changing the pore water pressure. Why the paper does not use this parameter? 8. Page 5 line 38 – 40, "Bishop's simplified method and Morgenstern-price method..... adopted". Which method is employed in the calculation?

For above comments, the reviewer think the paper needs to be greatly improved in three key issues and some specific points in order to reach a reliable regional landslide susceptibility map. So the reviewer would like to give the paper a rejection.

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2017-99/nhess-2017-99-RC1-supplement.pdf