Interactive comment on "Rainfall-induced shallow landslides and soil wetness: comparison of physically-based and probabilistic predictions" *by* Elena Leonarduzzi et al.

Anonymous Referee #1

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General comments: The topic of this study presented in this paper is interesting. The manuscript attempts to present the comparison of two different methods applied for rainfall-induced shallow landslide prediction. However, the data used for each method are mainly obtained from the database and estimations. So, it is hard to see the novelty of the study presented in this paper. The presentation of the results is quite difficult to understand since the authors presented the results of the probabilistic approach in graphical forms. The discussion covered something that has already been understood from the results of using data from estimations. The manuscript is more like a technical paper than an academic paper in the present format. This paper also needs to be grammatically corrected.

Specific comments: 1. Introduction Provide some reasons/ justifications for selecting the physical-based model and probabilistic in your study. Please state the urgency of comparing these two methods. What was the hypothetical background that prompted you to compare these two methods?

2. Methods: (a) The physical-based modeling is dependent upon the accuracy of soil properties data. Your current modeling study used estimated soil properties. Please state how accurate your estimation of soil unit weight, cohesion, and friction angles using method/ approach. Please provide some justifications of these approaches/ methods, perhaps by presenting some previous studies results in the Introduction section. (b) All datasets OpenLandMap are at a resolution of ca 250x 250 m, but the modelling considered a resolution of DEM at grid cell size of 25x25 m. Please state what method you chose to resolve this difference in map resolution. (c) Please justify choosing the values of cohesion due to tree roots of 5 - 22 kPa. The values may indicate that the soil layers have low strength.

3. Results The results of the physical modeling and probabilistic approaches also need to be presented in a spatial format and then validated with historical landslides.

4. Conclusions: please check again whether the conclusions drawn have answered all the research questions. You seemed to miss answering questions 1 and 3 stated in the Introduction section.

5. Please check the writing again for grammatical errors (see the attached file). You can use Grammarly to find the errors and to get suggestions for the corrections.

Please also note the supplement to this comment: https://hess.copernicus.org/preprints/hess-2020-624/hess-2020-624-RC1-supplement.pdf