

## ***Interactive comment on “A multivariate statistical method for susceptibility analysis of the debris flow in Southwest China” by Feng Ji and Zili Dai***

**Anonymous Referee #2**

Received and published: 10 January 2020

General comments: This manuscript presents a multivariate statistical model to predict the susceptibility of the debris flows in Southwest China. According to the topography and geomorphology characteristics in the study area, nine indexes were used to construct a factor index system of the statistical model. Then, 70 typical debris flow gullies in the study area were investigated as statistical samples to generate the model. 10 debris flow gullies on the upstream of the Dadu River were analyzed to verify the reliability of the statistical model. The results showed that the model has a satisfied prediction accuracy. In general, the topic of the manuscript is interesting, the methodology, results and conclusions are presented in a clear way. I recommend publication of the paper after addressing the following comments.

Specific comments:

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1. Section 2 describes the study areas of this work. Some pictures of the typical debris flow in this area are suggested to be provided. 2. As stated in the Methodology section, the authors carried out a series of bulk density tests, screening tests, drilling and geophysical prospecting. This part should be described in more detail, and the results of these tests should be provided. 3. Line 178-180: how was the criterion determined? why 1.5? 4. Line 188-189: How to obtain the "actual values"? Please give more detail. 5. Section 5 shows the validation of the model. This part should be presented in detail. For example, what do the R and R2 mean in Table 5? How to calculate the self-test coincidence rate in Table 6? How to define the residual error in Figure 3? 6. The susceptibilities of 10 typical debris flow gullies on the upstream of the Dadu River are calculated to verify the proposed statistical model. It is suggested to show some pictures about these debris flow sites. 7. The Fig.4 should be more informative, or it is suggested to be combined with Fig.5. Besides, the quality of the figures should be improved, such as Figure 2, Figure 3, and Figure 4.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-349>, 2019.

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