

## ***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 #1**

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This manuscript presents a statistical model to analyze the susceptibility of the debris flows based on investigation data on 70 typical debris flow gullies in Southwest China. Hayashi's quantification theory was used to establish the multivariate statistical model, and nine indexes were chosen to construct the factor index system to evaluate the susceptibility of debris flows. The reliability of the proposed model was verified by the susceptibility analysis of the 10 debris flow gullies located on the upstream of the Dadu River.

Some comments and suggestions are listed as follows:

1. Geological drillings are conducted in the active debris flow gullies. The detail information about the drillings conducted in this work should be provided, such as the drilling location, the drilling results.
2. Table 2 lists nine assessment indexes used in

the proposed statistical model. The reason why to select these indexes to evaluate the susceptibility of debris flow gullies should be clarified. 3. In Table 2, the value of antecedent precipitation x83 should be “Fully” rather than “Middle”. How to define the antecedent precipitation is “Inadequacy, Middle, or Fully”? 4. The results of the field tests mentioned in Section 3.2 should be provided and discussed. 5. In the Section 5.4, 10 debris flow gullies in the Kaka basin were analyzed to verify the accuracy of the prediction model. Please analyze the reasons why the prediction result of the Linong Gully does not match the actual susceptibility. 6. The quality of Figure 2 and 3 should be improved. For example, the horizontal axis is not correct.

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