

## ***Interactive comment on “Debris flow initiation characteristics and occurrence probability after extreme rainfalls: case study in the Chenyulan watershed, Taiwan” by Jinn-Chyi Chen et al.***

### **Anonymous Referee #1**

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The manuscript presents a statistical analysis of debris flow occurrence after extreme rainfall. The rainfall index was used to analyse the return period and the characteristic of debris flow occurrence after extreme rainfalls in an area also affected by earthquakes. An empirical method based on a relationship between probability of debris flow occurrence and return period was developed and it is successfully applied to the case of Chenyulan watershed (Taiwan). The main purposes of the manuscript are clearly defined. Even though the scientific question, the method is interesting and the scientific approaches are valid, the authors should modify the structure of the manuscript presenting the method before the case study. The desirable outline of manuscript should be : Introduction; Model and related sub-paragraph about model input data, variables

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and outputs; Case study and results of the model; conclusion. This is basically a good paper. The authors however need to address the following comments before being accepted: - Debris fall initiation should be replaced by debris fall triggering (e.g. lines 17 and 22 p.1); - Line 19 p.3 the equation should be labelled . The number of RI equation could be cited in Table 1. - Figure 1 should be improved (blue instead of light blue). - More details on study area and characteristic of debris flow (as volume involved and run out area and kind of soil involved) should be added. - The applicability or unapplicability of the model to other case study could be further discussed in the section 6 (Conclusion) - Numbering of sub-paragraph is suggested.

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