

## ***Interactive comment on “The susceptibility assessment of multi-hazard in the Pearl River Delta Economic Zone, China” by Chuanming Ma et al.***

### **Anonymous Referee #2**

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The manuscript describes an attempt to perform a multi-hazard susceptibility map of Pearl Delta Economic Zone in China. The issue of multi-hazard assessment is very interesting and it has still many open questions. The term “multi-hazard” is frequently used in the literature as an adjective to indicate multiple sources of hazard that are analysed in parallel and finally integrated into a multi-risk analysis. According to Corominas et al. (2013) multi-hazard assessment should refer to the joint probability of independent events occurring in the same area in a given time span. Multi-hazard assessment becomes relevant when hazard sources can interact, giving rise to a domino effect that occurs when a hazard event triggers a secondary event. In this paper six different hazards are considered. For each of them a susceptibility map is performed and then

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all the six maps are simply overlaid in GIS environment, providing a final multi-hazard map, thus not considering any potential interactions among the hazards and the possible domino effects. For example landslides and soil erosion are strictly connected and this aspect should be considered in the analysis. Furthermore the susceptibility assessment of each specific hazard is carried out with a simple method, completely neglecting the extensive literature on the geohazards susceptibility assessment, with special reference to the methodology and the selection and preparation of predisposing factors. In particular the selection of predisposing factors is arguable and an incomplete set of factors is considered. Some important factors, in fact (such for example vegetation) are not considered. Another relevant limitation of the analysis is that no information is provided about the model input data (resolution, date, source). In particular the resolution of the input data affects the resolutions of the final susceptibility maps that are not provided in the work. Eventually, what about the geological hazards database (landslide inventory map, collapse map and so on..) used to assess susceptibility? Some detailed information should be provided.

Additionally to these general considerations, I have several specific comments, listed below:

- The introduction is too long and not well focused. Some parts are useless (lines 37-50) and some other parts are not clear (lines 85-88). It is quite curious that in the Introduction you don't mention which type of hazards you consider in your analysis. In line 94 you state "...aforementioned geohazards" but I cannot find where you have mentioned them!;
- Some sections inside the study area are very short (2.2, 2.3 and 2.4). I think they can be merged;
- What is the definition of collapse in your work and which is the difference between collapse and karst collapse? Furthermore why landslide and collapse have the same casual factors? In my point of view they are quite different phenomena. This point should be clarified better.
- No quantitative validation of susceptibility maps is performed. This is not correct since every model has to be validated in order to evaluate its performance. There is only one general sentence in the Con-

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clusion (lines 566-568), which is absolutely not enough. - Figures are too small, words inside are not readable. - In general English is not good. Even though I am not an English mother tongue, I have identified several errors and mistakes and the authors have to carefully check the language.

Based on the above comments I think that the manuscript cannot be accepted for publication in the journal. My main concerns, as stated above, are related to the methodological approach that is too superficial and do not take into account relevant aspects related to susceptibility assessment.

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