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Discussions

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

Anonymous Referee #1

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In this study, the authors presented an approach based on Analytic Hierarchy Process (AHP) and the Difference Method (DM) to assess multi-hazard susceptibility to identify susceptibility areas in the Pearl River Delta region. This is a cutting-edge idea to find geological hazard susceptibility areas, which is quite import and valuable for decision-making and geological hazard management. However, the paper has several crucial faults so that I don't think the current version is good enough to publish in this journal. I leave the decision to the editor to decide the fate of the manuscript. The first major problem is, the authors did not provide / collect enough data to support their study which make the results based on the inadequate data unbelievable. For example, the authors only presented datasets of precipitation, topography, geology,

etc. Such datasets are enough to assess geological hazard susceptibility? Obviously, no. For instance, soil erosion and landslides have a strong relationship with vegetation cover; without vegetation cover map, how the authors could provide a correct susceptibility map for landslides or soil erosion? Seawater intrusion also has a strong relationship with freshwater discharge provided by the Pearl River, without hydrological data (e.g., annual mean runoff and long-term runoff fluctuation; besides, insufficient seasonal runoff caused by human activities (irrigation, water impoundment for energy generation) also can led to seawater intrusion), is it possible to identify regions with high susceptibility to seawater intrusion? The second problem, which is the key issue, is that the results are questionable. As we all know, for each geological hazard listed in this study, there is susceptibility map already. We can just compare the results in the study with the maps released by government or previous studies. For example:Zhao et al. (2014) released susceptibility map for landslides for the whole Guangdong Province (obviously include the entire delta area of the Pearl River): (Figure from Zhao et al. (2014), please see the attached pdf file) The authors' result failed to identify the circled area as the high susceptibility area for landslides.

According to the investigation by Geological Survey Bureau of China (http://www.cigem.cgs.gov.cn/cgkx_4859/201703/t20170316_424756.html), the high susceptibility areas for ground subsidence in the Pearl River Delta area are Foshan, Guangzhou, Jiangmen, Zhongshan, Zhuhai and Shenzhen. However, the result map provided by the authors didn't identify Shenzhen as the high susceptibility area. In fact, ground subsidence events in Shenzhen have been reported by many studies.

For soil erosion susceptibility map, we can also get the soil erosion map for the Guangdong Province via the link (http://www.dsac.cn/DataProduct/Detail/20080604) (please see the attached pdf file)

The soil erosion map provided by the study also failed to identify the circled area as the high susceptibility area for landslides (please see the attached pdf file).

All in all, I think the results provided by the authors are quite unbelievable.

The third problem is that the manuscript has too many English grammatical mistakes, the authors MUST carefully check each sentences before next submission. For example (in first six pages I can find near 20 problems): Line 13: The main scope of this paper [is assess]multi-hazard susceptibility to identify area by using an integrated susceptibility... Line 29: geo-hzards management Line 57: loss of human life (lives?), reduce economic consequences (or loss?) Line 58: it is very meaning (meaningful?) to Line 61: Since geological hazards are (a?) complex phenomena Line 65: relative information of different hazards is (an?) important tool Line 69: a complex process and confronted with a challenges Lines 73-74: describe the real relationships of different influencing factors (why you describe the relationships between different influencing factors?, you should investigate the relationship between result with the influencing factors). Line 77: One widely used method of (for?) susceptibility assessment Line 79: hazards susceptibility in this (a ?) unit is considered high Line 91: hazard susceptibility is assessed [with via??] of the Analytic Hierarchy Process Line 93: The difference (different?) method is used Line 94: the five aforementioned geohazards (geohazard?) susceptibility assessment Line 109: Fig.1 The map (what map?) of the study area in The Pearl River Delta Economic Zone Line 112: The rainfall is characterized by large (high?) precipitation Line 117: Fig.2 The (spatial distribution of?) precipitation map of the study area Line 121: The terrain is smooth (flat?), Line 122: Based on the different genetic (what do you mean genetic? Geological?) type Reference: ZHAO HongtingïijŇLIU XilinïijŇYU ChengjunïijŇSHANG ZhihaiïijŐRisk Assessment and Temporal-Spatial Changes of CollapseïijŇLandslide and Debris Flow in Guangdong[J]ïijŐTropical GeographyïijŇ2014ïijŇ34ïijĹ6ïijĽïijŽ804-813ïijŐ

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-104/nhess-2018-104-RC1-supplement.pdf

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