Natural Hazards
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Discussions

Interactive comment on "Comparison of statistical and analytical hierarchy process methods on flood susceptibility mapping: in a case study of Tana sub-basin in northwestern Ethiopia" *by* Azemeraw Wubalem et al.

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Dear Reviewer, we appreciate your constructive comments and suggestions which helped me a lot in improving the quality of my manuscript. We do hope that your comments, suggestions, and concerns were addressed in my revised manuscript. Having said this, we will proceed to the responses to questions and comments. 1. English language As per your comments, we have made substantial improvements on the grammatical, typological, and sentence structure problems throughout the manuscript because it also one of the comments by reviewer #1. 2. It is well known that TWI is

a commonly used very simple traditional flood hazard mapping, however, this method is used considering only the slope and flow accumulation in a region. Nevertheless, flood hazard is the result of the combination of several factors like soil texture, depth of groundwater, land use, vegetation cover, elevation, rainfall, stream density and distance from streams, the depth of riverbank. To solve the above-mentioned limitation of TWI, the use of statistical and analytical hierarchy process methods is very important to evaluate the spatial statistical correlation of flood driving factors and flood points. We have accepted your comments to explain the advantage and disadvantages of TWI in the introduction sections as per your comments. 3. It is possible to use all flood points for model development and validation, however, it resulted in a less reliable model and validation because it uses the same flood data layer for both training and validation purposes. Nevertheless, it can reduce sample size and sampling bias. The most important method is classified flood pixels as training and the testing data layer. 4. Because in the study area, floods frequently occur along the river floodplain, and backflush from Lake Tana that over flooded to certain areas. This is the reason why flood points are concentrated along riverbeds.

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