Natural Hazards
and Earth System
Sciences
Discussions

Interactive comment on "Erosion risk assessment and identification of susceptibility lands using the ICONA model and RS and GIS techniques" *by* Hossein Esmaeili Gholzom et al.

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Subject: nhess-2020-85 – Author Comment Thank you very much for your efforts. We hereby kindly appreciate your careful scrutiny on our submitted manuscript. It was tried to get your satisfaction by improving the manuscript. The following answers are offered to convince the respectful referees. We request you inform us if any further correction will be needed. Modified items are marked in the new revised manuscript.

Best regards Dr. moeini,

Anonymous Referee 1 Received and published: 4 Aug 2020

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General remarks this is a rather confusing manuscript for several reasons. The most important issue is the language. I advise the authors strongly to use a professional, native English translator for improving the language. Furthermore, the objective of this study is not clearly described. In the end, the erosion risk assessment using the ICONA model is compared with an existing result from the PSIAC model, without a discussion on the comparison. In 3.3, it is stated that high erosion intensity is not observed in the study area (line 277) (not clear where this is coming from), but no discussion on this outcome is made for discussing the results from the ICONA model. I regret to state that this manuscript is unacceptable. If the authors present this in a C1 NHESSD Interactive comment Printer-friendly version Discussion paper better way, indicating clearly the objectives, describe the validation of the results, put the results in perspective and discuss the consequences of the outcome in terms of possible focus areas for soil conservation, this may become an acceptable manuscript.

Specific remarks: 1. Line 31: present and describe the different models. You have listed here just a sequence of models without categorizing them in e.g. empirical versus process based, different timescales (event based, annual), different spatial scale. - It is corrected. Introduction modified in the new revised manuscript and new contents were added, lines 32 – 47.

2. Add more literature on erosion models and erosion risk assessment studies. - In the introduction, more literature were added in the new revised manuscript, lines 48 – 65.

3. Line 38: why is it necessary to find 'quick and timely solutions'? - After modifying the introduction, This term was removed in the new manuscript. Our goal is to use a model that can describe the soil erosion state with minimum parameters, minimum time and low cost, fast and high accuracy with the use of RS/GIS techniques. This is possible with the ICONA model, Lines 64-65, 94 – 99.

4. The introduction contains a lot of redundancies, try to funnel a bit more starting from the broad description of erosion models, risk assessment, the study site situation, and

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your objectives in this. - Introduction is modified and these cases were added in the new revised manuscript, lines 74 – 84.

5. Section 2.1: I miss data of the climate for the study area. - It is mentioned in section 1-2 in the new revised manuscript, lines 112 and 113.

6. Section 2.2: this sounds like a lot of work done for gathering the input data, but nowhere are results or a discussion of this procedure presented. Only the final map is presented. - In order to be concise and reduce the volume of the article, the product of the work done was used. Because the main purpose is to describe the ICONA model and its effectiveness in assessing the risk of erosion in the study area.

7. Line 104: so you validate your model result with outcome of another model? That is no guarantee that results are reliable. - Our goal is not to validate the ICONA model with the MPSIAC model. In most of the watersheds of Iran, the PSIAC model is widely used. For this reason, the purpose of providing the MPSIAC model is only as a base model to evaluate the results of the ICONA model with it. Then we can determine the future efficiency or inefficiency of the ICONA model in other watersheds. The necessary corrections to the new revised manuscript are given in lines 101-103 (introduction), 154-160 (data and methods), 296-309 (section 3.3) and figure 7, 358-365 (discussion) and 383-385 (conclusion). Section 3.3 has been completely revised and improved.

8. Table 1: Caption does not explain what is in the Table, what is MB, M, B, a, b, c etc.? - The description of these acronyms is given at the bottom of Table 1.

9. Table 3: what is K-factor? - K-factor, shows the degree of soil erodibility.

10. Legend Fig 3: 'Very low' is lower than 'Low', so sequence should be adapted. Swap colours for 'Steep' and Very steep' (red is normally worse than light red) - We have changed the colors and legend Fig 3. 11. Line 201-202: this procedure should be explained in 'methodology', and a discussion on the outcome should be presented. What do these figures imply? - Table 5 was deleted and The necessary information

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was given in Section 2.2, lines 138-141.

12. Fig. 6: Colours and legend seem to be mixed here, use the same colours as for Fig 3.

- We have changed the colours and legend Fig 6. 13. Fig 7b: Legend is not in sequence of severity ('low-moderate-very low', should be 'very low-low-moderate'? We have changed the colours and legend Fig 7. 14. Line 315: what is 'human erosion'? - This sentence was removed by modifying and organizing the discussion section in the new revised manuscript. It refers to human activities that exacerbate erosion. Of course, this phrase is not translated correctly.

15. Line 353: where is the conclusion that the erosion risk map is 'sufficiently accurate' based on? There is no ground prove (measured data) for this presented. If it is based on the comparison between models, then I would have expected a better discussion on that, and the limitations of this procedure explained. - In order to explain this issue, The necessary corrections to the new revised manuscript are given in lines 101-103 (introduction), 154-160 (data and methods), 296-309 (section 3.3) and figure 7, 358-365 (discussion) and 383-385 (conclusion).