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Discussions

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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 2 Received and published: 9 October 2020

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[Discussion paper]

I read the manuscript "Erosion risk assessment and identification of susceptibility lands using the ICONA model and RS and GIS techniques". The manuscript describes the application of remote sensing data, GIS and the erosion risk model ICONA in order to identify areas that might appear to be susceptible to soil erosion. After reading the manuscript, I see a lack of innovation and inconsistencies throughout the entire manuscript. In my opinion, it might be considerable for publication after the authors made some severe modifications and a major revision has been done.

General comments:

- The manuscript is written in poor English and should be revised.

The manuscript was revised by an English language expert and Institute.

- The authors do not provide a research gap. The manuscript describes a case study, which is per se not a problem but I see a major lack in innovation.

We modified the manuscript and improved its literature. The purpose of this investigating is to use a model that can describe the erosion risk assessment with minimum parameters, minimum time, low cost and high accuracy by use to RS/GIS techniques. This is possible with the ICONA model. Lines 64-65, 94 – 99.

- The conclusions drawn partly do not reflect the outcomes of the approach.

We have modified on the discussion and conclusion sections in the new revised manuscript.

- The terms "erosion risk" and "erosion susceptibility" are confusingly and not consistently used throughout the entire manuscript.

These terms have been further refined in the new revised manuscript edited by an English language expert.

Specific comments:

L12: RS and GIS were never abbreviated.

It is corrected on line 12 and throughout the new manuscript.

L20: What is meant with "appropriate land cover"?

"Appropriate land use plans" is what we replaced in line 22 in the new revised manuscript.

L21: redused = reduced

By modified and deleting lines 21 and 22, the term was removed in the new revised manuscript.

L21-22: This is a very broad and obvious statement.

We deleted this sentence in the new manuscript.

L24: This not just happens "nowadays".

We removed this term in the new revised manuscript.

L30: The authors should be careful with the use of the terms "sensitivity" and "potential" in this case.

These terms have been further refined in a new manuscript edited by an English language expert.

L31: The authors are requested to provide references for the mention models.

We have given the references in the new revised manuscript, lines 37-38.

L35-40: The information provided in this paragraph can be condensed to a single sentence.

These few lines are summarized in the new manuscript (lines 69-70).

L43: What are "the four main inputs"?

"This model starts with 4 layers of information (slope, geology, vegetation and land use)". We have given this in lines 13 - 14 and line 71.

L60: Reference for PSIAC method is required.

A reference is given in line 103 in the new revised manuscript.

L60-62: I do not see a scientific innovation or a research gap needed to be filled.

In the last paragraph of the introduction, we provided more correction and explanation.

L66: Coordinated do not have to be mentioned since they appear in the cross-referenced figure.

Yes, if you think I should remove coordinated, let us do it.

Figure 1: The illustration of Mazandaran province poses another subplot and should be numbered as the others. The colour scheme from light green to green is rather not beneficial to illustrate elevation.

We have modified the items in Figure 1.

L78-79: Reference for the data sets is requested.

A reference is given in line 126 of the new revised manuscript.

L90: Where were those samples collected?

These samples were prepared in different land uses of the study area.

L94: "developed and developed". The description of the ICONA model was already mentioned in the introduction. These sentences are redundant.

This sentence was removed in the new revised manuscript.

L104: How does the evaluation procedure works precisely? This is too general.

To explain the subject, the necessary corrections in the new manuscript are given in

Section 2.3, Lines 154-160 and section 3.3, Lines 296-309 and figure 7.

L107: Well, validation might be important, but it is not performed in this paper and it cannot be done without ground truth data.

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.

L149: 5x5x5 matrix? Which quantitative values have these erosion risk classes?

This matrix is related to erodibility classes and soil protection classes to prepare an erosion risk map.

L231: The authors should not use the term "significant" if they did not perform a statistical analysis that provides information about statistical significance.

Instead of the word "significant", we replaced the word "great".

L272-278: This is not a result.

Section 3.3 was completely modified in the new revised manuscript and improved with Figure 7.

L304: Generating a classified slope map is a very limited finding.

This sentence was corrected in the new revised manuscript (lines 328 - 329). The very high slope class covers an area of 3632 hectares. According to Table 2, a large part of the area of kasilian watershed is in the high to extremely high slope class (12-20, 20-35 and > 35), which covers a total area of 6202 hectares. That is why this sentence

was raised.

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