

Dear Editor in Chief

We are pleased to submit a revised manuscript entitled *Efficacy of using Radar Induced Factors in Landslide Susceptibility Analysis: case study of Koslanda, Sri Lanka* for publication in the Journal of Natural Hazards and Earth System Sciences. A revised copy of the manuscript is provided with changes to the manuscript requested by the reviewers indicated in the attached document, together with detailed responses to the reviewers' comments.

Yours Sincerely

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Responses to reviewer comments on the paper " Efficacy of using Radar Induced Factors in Landslide Susceptibility Analysis: case study of Koslanda, Sri Lanka"

We wish to thank all reviewers for their constructive comments. All reviewers felt that the paper has to be well organized and the introduction part should be reduced by moving some parts to the methodology. Specifically, all reviewers felt that the description of the study area should make as little larger with comprising additional information about the geology and the typology of the landslides. Further they have commented on the rewriting of the abstract and the conclusions according to the conducted research work. All reviewers stated on the inclusion of colour figures as they are more appeal. Consequently, the paper is rearranged with the rewritten abstract, reduced introduction, properly arranged methodology, and study area. Results and Discussion were separated and Conclusions changed accordingly. All the figures were inserted with the colour by preserving the colour blindness using colour scales. The details of these changes are provided below, along with responses to the other more minor comments.

In the following, the comments of the reviewers are shown in italics and our responses indented in normal text. References to the edited lines are according to those found in the revised manuscript, unless specifically referred to in the original manuscript.

Response to Anonymous Referee #2.

The paper deals with a topic of interest for the journal. I think it could be of interest for the readers. However, in my opinion there is still work to be done in order to make it suitable for publication.

* *As the other reviewers, I think it is not well organized.*

According to the other reviewers, in order to organize the paper, all their comments are addressed.

* *The abstract is "strange". It is not a good summary of the paper.*

The abstract has been rewritten. (page 1, lines 9 – 20)

- * *I think also that the introduction is not well focused and too long.*

The introduction part made improved by reducing the extra information where unnecessary. Deleted the Lines, page 2 lines 3-5, lines 10-12, line 22, and lines 28-29.

Further, as commented, part of the statistical methods for landslide susceptibility analysis moved to the methodology part. (page 3 lines 17-33 and page 4 lines 1-2 to page 9 lines 22-30, page 10 lines 14-24).

- * *And I see too long sentences which sometimes makes difficult the understanding. Can you improve it?*

Some too long sentences were made short. (page 1 lines 23-29)

- * *The quality of the figures is poor. Why do not use colour figures?*

All the figures were inserted in to the manuscript with the colour by preserving the colour blindness using colour scales. (Figure 1, 2, & 4)

- * *The analysis of the results is also very qualitative.*

All the predisposing factors are overlaid with the training sample from landslide failure map and calculated the weight of susceptibility index for landslide occurrences. Then by using bivariate and multivariate analysis landslide prediction models are generated with and without radar induced factors. Hence, all the landslide prediction analysis is quantitative. However, in order to make the models are more interpretable for the users, weight of indexes is discretised in to four classes as 60%, 30%, 10%, and 0% of failure regions for high, moderate, low, and very low landslide susceptibility classes respectively.

- * *In the conclusion, the authors say that "with the integration of RIF as surface roughness, near surface soil moisture 15 from Delta Index, and forest biomass, the detection of the boundary between the high and very low susceptibility areas is increased". However, it is not well demonstrated from the given results and explanation. Can you improve it?*

Table 1, Landslide susceptible area comparison from bivariate and multivariate analysis without and with RIF, BiNR -Bivariate analysis without RIF, BiWR -Bivariate analysis

with RIF, MNR -Multivariate analysis without RIF, MWR -Multivariate analysis with RIF, describe the particular results and also under the Discussions, the results were explained (page 13 lines 3-11)

* *I am not sure that from the result one can conclude that RIF helps to improve the results. I see very similar results by using and by not using the RIF parameters. Please, can you improve your analysis in order to be more convenient or change the conclusion?*

All prediction and validation analysis are based on the past landslide experiences in the same area, thereby minimizing bias and errors from human intervention. In multivariate analysis, weights are calculated by using expert knowledge. However, consistency ratio is measured in order to confirm the consistency of relative importance. Hence, all prediction results are depending on the past landslide occurred in this study area and the statistical analysis. Table 1 compare the landslide susceptible areas from four different landslide prediction models by bivariate and multivariate with and without radar induced factors numerically. Even though, it was seen as similar, I hereby confirmed that, all the analysis are numerical and is different.