REPLY TO GMD-2021-343 REVIEWERS'COMMENTS

In the following, we reply to the reviewer's comments and suggestions. The original comments/suggestions are in black, and our answers are in red. The added or modified text is in red italic.

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REPLY TO 'COMMENT ON GMD-2021-343'

ANONYMOUS REFEREE #1, 04 MARCH 2022

Landslide susceptibility analysis predicts where landslides are likely to occur, which is very important for human. There have been many methodologies to assess landslide susceptibility. However, a standardized methodology, procedure and software for susceptibility assessment is still required. This study developed suite of tools for statistically-based landslide susceptibility modelling. However, the current version looks like a specification and the scientific contributions need to be stressed. In addition, how does this software provide a standardized susceptibility analysis or how can people use it at a standard way?

LAND-SUITE does not want to propose a standard procedure for landslide susceptibility assessment, but it is an attempt (i) to facilitate the preparation and the selection of the variables/data required for a statistical susceptibility modelling, (ii) to provide largely used statistical approaches to derive susceptibility zonations, and (iii) to give largely recognised metrics to evaluate such modelling outputs.

We carefully checked the use of the term "standard" in the manuscript and, where needed, we removed or substituted it with more correct terms throughout the text.

The differences between this study and Bornaetxea et al. (2018) should be well presented.

We thank the reviewer for the comment and we realized the text was unclear. This manuscript cites Bornaetxea et al. (2018) in section 4 "LAND-SUITE application" only as a reference for a detailed description of the study area and the available thematic data. To better clarify this, we modified the paragraph at the beginning of section 4, as follows:

"To better illustrate the LAND-SUITE functionalities, we selected a portion of the study area located in the Gipuzkoa Province (northern sector of the Iberian Peninsula) where a landslide inventory and 14 explanatory variables were mapped (Bornaetxea et al., 2018). This set of thematic data is used to describe different applications of LAND-SUITE (i.e. Case A and C in Figure 1) and to provide examples of the susceptibility analysis outputs, including plots and maps."

The authors stated that LAND-SUITE provides a tool that can assist the user to reduce some common source of errors coming from the data preparatory phase, and to perform more easily, more flexible and more informed statistically based landslide susceptibility applications. But I cannot get such information. How can this tool help to reduce the errors in the data preparation

and why is this tool more informed?

We thank the reviewer for the comment, and to avoid misleading interpretations, we simplified the sentence as follows:

"LAND-SUITE provides a tool to assist the user during the data preparatory phase and to perform diversified statistically-based landslide susceptibility applications."

Major concerns:

Abstract:

1. Line 10: The authors stated that some physically based models are available. What is the purpose of this statements?

The purpose of this statement is to introduce and stress the novelty of the work which focuses on software for statistically-based landslide susceptibility zonation. Indeed, while there are many physically-based tools for distributed landslide modelling, only a few exist for statistically-based modelling. To make this more evident we rephrased the sentence as follows:

"*The literature search revealed that several software and tools are available to evaluate regional slope stability using physically-based analysis, but only a few use statistically-based approaches.*"

2. What is the limitations of LAND-SE? What is the difference between LAND-SUITE and LAND-SE?

The text of the abstract (line 8 to 12) was modified as follows:

"*This paper describes the structure and the functionalities of LAND-SUITE, a suite of tools for statistically-based landslide susceptibility modelling which integrates LAND-SE. LAND-SUITE completes and extends LAND-SE, adding functionalities to i) facilitate input data preparation; ii) perform preliminary and exploratory analysis of the available data; iii) test different combinations of variables and select the optimal thematic/explanatory set.*"

3. Some results and conclusions in the specific applications should be added in the abstract.

As explained in Chapter 4 (line 302-303) the specific application is described only as an example of the software usage and the critical discussion of results and their scientific relevance is out of the scope of this manuscript and then we believe this should not be described in the abstract.

Introduction:

4. Line 59: shows why the authors further developed the LAND-SUITE model? If so, more details should be given rather than only cite the table in the existing literature.

Thanks for the comment. We recognize the citation was misleading and we removed the citation of the table.

5. Line 64: the advantage of LAND-SUITE over LAND-SE should be stressed.

We changed the text as follows:

"To better support the overall landslide susceptibility assessment process, we have designed and implemented the LAND-SUITE software (LANDslide - SUsceptibility Inferential Tool Evaluator), which integrates LAND-SE, able to execute different susceptibility model types and to evaluate their performance and uncertainty. LAND-SUITE completes and extends LAND-SE, adding functionalities to i) facilitate input data preparation; ii) perform preliminary and exploratory analysis of the available data; iii) test different combinations of variables and select the optimal thematic/explanatory set."

Data requirements and specifications

6. This section needs to be reorganized. Currently, it is not logical and difficult to get the central information.

We merged the chapter with the "Software description" modifying the text. Most of the text was moved in the User Guide.

Software description

7. A simple schematics can be provided to show the link of three modules.
8. A table can be added to show the functions of each module.

As suggested by the reviewer, we added a new figure (Figure 1). The other figures were renumbered accordingly.

LAND-SUITE application

9. The authors need to present how to use this tool at a standard way in the applications rather than just show some results.

The details of the use of LAND-SUITE are already described in the User Guide available as a Supplementary Material.

Final remarks

10. Some prospects and limitations can be provided in this section.

Some of the prospects and limitations are already briefly described in the "Final remarks" section, where we added the following text:

"We acknowledge that LAND-SUITE does not consider all the statistical approaches for landslide susceptibility modelling and zonation, which can be potentially included in future software upgrades. Possible LAND-SUITE advancements can also be achieved by implementing new procedures to evaluate the variables' significance across the different statistical approaches."

In addition, we modified the last paragraph as follows:

"LAND-SUITE can be used to model and evaluate the spatial probability of the occurrence of other types of natural phenomena (such as floods, forest fires, rock falls source areas, e.g. see Rossi et al., 2021) and this use may highlight the need for specific code modifications and refinements. Indeed, as an open source tool, LAND-SUITE can be easily modified by a R programming skilled user and adapted to any specific needs."

Code availability

11. I cannot access the software via the doi: 10.5281/zenodo.5650810.

We checked the link, which correctly refers to the software repository. As for scientific articles, the DOI link can be resolved using specific web services like https://dx.doi.org/. To visualize/download the software in the repository, it is mandatory to request access (that can be done using the specific button). The link works correctly and we already got several access requests.

Minor concerns:

Line 25-30: add some references

We added new references

Line 41: add some references

We added the references to the software codes

Line 41: "are available"?

We modified the sentence

Line 49: propose -> proposed

Done

Line 55, give the version of R

This information is reported in chapter 6 "Code availability and licence"