

Second Review Comments nhess-2021-334

We kindly appreciate the comments of the two referees and in the following lines we provide specific answers to their questions. In addition, where needed, we amended the manuscript in order to address the issues raised by the reviewers.

Referee#1

I believe that the manuscript can be published after minor revision. My specific comments are as follows:

1) Line 143 - 3.1 Data

- Please correct the section numbering. Section 3.1 was already used for Methods.

Thanks for pointing it out. We corrected the error.

2) Figure 3: Frequency area distribution curves (FAD curves) for Spot 2020 (green), GSI Historic (brown). Landslide distribution map for Spot 2020, GSI Historic, GSI Field and Gipuzkoa inventories.

- The Gipuzkoa inventory has been removed from Figure 3. It should also be removed from the figure caption.

Thanks for pointing it out. We corrected the error.

3) Figure 5:

- Please arrange the lithology types in the figure caption in the order in which they are given on the graph, starting with Brw.

Thanks for the suggestion. We corrected the order of the Land Use and Lithology types in the caption of Figure 5.

Referee#2

Stepping late into this review process, I think the submitted article is clearly within the scope of NHSS and a nice contribution regarding preparation and checking of landslide inventories. The paper has also clearly benefitted from previous revisions, and I think the article is not far from being acceptable for publication. While reading, I've made some minor observations that the authors should consider during final revision.

P2L63: CoLM: This is an important concept throughout the article and may be explained in more detail. Additionally, I am not sure if CoLM can be generally considered homogenous when using remotely sensed data because also here (e.g. for aerial photos) portions of the terrain can be covered by shadows or clouds and are hence not visible.

We thank the reviewer for this comment. We modified the manuscript in P2L60 as follows:

“Also, the presence of shaded areas and clouds may hamper landslide recognition. However, for satellite or aerial images, the visibility of the territory is referred to the position of the sensor, and it can be assumed almost constant along the territory. Therefore, in this work we assume that inventories based in remotely sensed images were compiled in homogeneous working condition and then with uniform Capacity of Landslide Mapping (CoLM) over the studied area.”

P3L87: “Sequences of different grades of rocks”: What is meant here? Grades of metamorphism?

The reviewer is right. In this sentence “grades” refers to the grades of metamorphism. We modified the sentence in P3L85 as follows: “The area is a part of active fold thrust belt of Darjeeling Himalayas where sedimentary rocks of Sub-Himalayas, low grade metamorphic sedimentary rocks of lesser Himalayas and high-grade metamorphic rocks of Higher Himalayas are present with or without the overburden cover of varied thickness. These sequences of different rocks are separated ...”

P4L105-108: The concept of EV should be illustrated with a suitable sketch to make it better understandable

Following the suggestion of the reviewer, we added an additional figure in the supplementary material. And we added the following text to the manuscript in P4L109 “(Fig. A1 in the supplementary material illustrates the concept of EV and solid angle)”

P6L145: GSI Field-inventory: What was mapped here? Generic landslides? Is there any typological information or are really just co-ordinates available?

There is no typological classification for this inventory. We only had the points positions.

P6L160: Isn't it that the SPOT-inventory represents landslides originated in the same time span as those of the GSI Field-inventory? Maybe these inventories should be compared?

Correct, indeed we initially checked the possible overlay between the SPOT and GSI-Field inventories, but it was not possible to recognize field data from the satellite images. As a consequence, they were used as two distinct inventories in the analysis.

P8L189: Landslide density in SA-classes is not shown in Fig. 5 but in Fig. 6?

Correct, the sentence was misleading. We removed "see Fig. 5" because actually landslide densities are not shown in Fig. 5.

P11L236: Why was not the SPOT-inventory compared against the GSI-Field inventory in this manner? Both inventories aim surveying landslides of the same time period, so this might be of interest?

Unfortunately, we don't have the information about the sizes of the landslides in GSI-Field, so the size distribution analysis can't be performed.

P12L250: What is the rationale here comparing a landslide inventory of a completely different area (with different characteristics in terrain visibility) with the Darjeeling inventories?

We appreciate the comment of the reviewer and we added some lines in P12L256 in order to better explain the rationale. The added text is the following:

*"We decided to run an extra experiment with this data set because we sought confirmation of the relevant role played by EV in influencing the spatial distribution of landslides in the inventories. In fact, since in Gipuzkoa information on the detailed road route followed by the surveyor was available, we expected the distribution of landslides to be even more influenced by visibility than in Darjeeling, where, due to the absence of specific information, the simulation of visibility was done using the entire road network. This additional inventory includes 542 shallow landslides and is referred to as **Gipuzkoa** inventory."*

P13L287: But the roads in your study area are mostly located on ridges (as stated before) and hence might not be considered a causative factor for landslides since slope undercutting due to road construction might be excluded in your area?

The reviewer is right, but in this part of the discussion we are addressing the general concepts about roads and landslide occurrence, referring to the literature. We are not referring to our concrete case in Darjeeling.

P14L324: The results obtained from the Spanish inventory cannot be verified by the reader since no EV class map or any other results from the visibility analyses are shown. I am not sure if introducing this inventory in your paper is helpful.

Following the suggestion of the reviewer, we added an additional figure in the supplementary material. And we added the following text to the manuscript in P12L367 *"(Fig. A2 in the supplementary material shows the EV map obtained from the visibility analysis in Gipuzkoa)"*.