Reviewer 4

General comments

1) Please give your paper to a native English speaker to correct errors in English language

Reply: Grammatical and writing style errors in the original version have been corrected by our colleague who is a native English speaker.

2) There are several inconsistencies in the text to which other referees already referred to 3) I would propose to use "frequency" instead of "occurrence number" (also in Figures and Tables). 4) I would also propose to use "low-frequency" and "high-frequency" instead of "low-occurrence" and "high-occurrence" respectively (also in Figures and Tables).

Rely: To be consistence, "frequency" was used instead of "occurrence number" "low-frequency" and "high-frequency" were used instead of "low-occurrence" and "high-occurrence."

5) How would you justify the division of the factor "lithology" into separate classes before putting them through the logistic regression? 6) How do you justify the decision to use the metamorphic formation as a reference category in the modelling? Shouldn't it be more correct to divide all lithological units in similar proportion first part for the model development and second part for model testing or as you put it a reference category in the modelling?

Rely: We followed the suggestion in model process. From the testing results, we selected Metamprphic formation as the reference in entire landslide and low- frequency landslides models. Moreover, the Alluvim formation was selected as the reference in high- frequency landslides model. Table 1 shows logistic regression model results with entire, low-frequency and high- frequency landslides.

7) Susceptibility, hazard and risk are three different terms with different meanings. You should distinguish between them and clearly state which of the three did you "produce"

Rely: Thanks for the comments. The study discusses about landslide susceptible areas in a landscape scale. The modifications were in the reversion.

Specific comments.

Comments to the text 1) Line 74: The sentence "The geological and geomorphological properties affect landslide inventories (you probably meant occurrence; inventory is a database that is compiled by experts that are most probably not under the influence of geology or geomorphology): : :" is unclear.

Rely: The sentence was modified as "The geological and geomorphological properties affect landslide occurrences and inventories at the sites."

2) Line 106: : : :watershed are above 1000 m of elevation and the average: : :

Rely: The sentence was modified as the suggestion.

3) Line 116: Please correct the "Matamorphic" in the Figure 1 legend to "Metamorphic". In Figure 1 it is Geological map of the study area.

Rely: The typo in the figure was modified.

4) Wherever you write distance to faults, rivers and roads you should use the plural instead of singular since you calculate the distance from a net of linear elements, not the distance from only one.

Rely: These terms were modified as the suggestion.

5) Line 129: The brief descriptions are given in the following text.

Rely: The sentence was modified as the suggestion.

6) Line 133: : : :significantly between lithological types: : :

Rely: The sentence was modified as the suggestion.

7) Line 141: if you're referring to the data mean in the Figure, it should be given there (this comment goes for all factors in Figure 2).

Rely: The sentence was modified as the suggestion.

8) Line 153: : : :shallow colluvium: : :

Rely: The sentence was modified as the suggestion.

9) Line 157:

Sentence "In the area: : :" is unclear.

Rely: The sentence was modified as the suggestion. "In the study, distances to

built-up lands and roads are the anthropogenic driving factors to landslides."

10) Line 220: Table 2 – Is the number under the column "Landslide patch number" the number of new landslides? If yes, how did you distinguished between the re-occurred landslide and already existing one? If no, results of analysis are biased since you included already existing landslides in the interpretation of impact of disturbances on landslide occurrence.

Rely: No. The study does not consider that the interpretation of impact of disturbances on landslide occurrence in a specific event. Overall, land cover contains historical memory in landslides in the study area. The study concerns about existing landslide landscape across a large scale.

11) Line 237: Table 3 – Could the high(er) mean size of patches in the Pattern 1 (small landslides) be the result of overlapping effect of several small landslides, which could due to coarse satellite image resolution, result in their final classification as one little larger (i.e. of the size of one pixel) landslide?

Reply: Thanks for the comments. Spatial data will be caused by the scale problem. Further investigation will discuss this scale problem for landslide susceptibility mapping.

12) Line 237: Table 3 – Could the high value of TE in the Pattern 8 be the consequence of longer landslides or debris flows?

Reply: In landscape metrics, total edge (TE) and edge density (ED) of landslide are from edge metrics in the study. Moreover, spatial landslide patterns could be the consequence of landslides.

13) Line 255: The statement that ": : :a longer landslide class edge is in the low-occurrence (you probably meant less-frequent) landslides." is not exactly correct. If you compare TE/NP you get similar trends as with MPS and PSSD.

Reply: A longer landslide class edge (TE) is in low-frequency landslides. Moreover, the Edge Density (ED) that presents the patch edge densities become large in occurrence number =2~ 6. The differences were shown in the manuscript.

14) Line 286: You forgot to comment the importance of the lithology.

Reply: Thank for the comments. The paragraph was added in the reversion.

15) Line 326: What is a landslide source?

Reply: The sentence was modified. The confusing term 'landslide source' was deleted.

16) Line 332: I'm not sure that this statement is correct. According to relation between the Landslide patch number and 24-hour rainfall values (Table 2) the trend of landslide numbers increases years after the earthquake despite the fact that the trend of rainfall intensity slightly decreases.

Reply: Thanks for the comments. The sentence was added in the reversion. "According to relation between the landslide patch number and 24-hour rainfall values (Table 2), the trend of landslide numbers increases after the earthquake despite the fact that the trend of rainfall intensity slightly decreases."

17) Line 348: Where's the lithology? To your interpretation lithology is not important for landslide occurrence. So it doesn't matter whether the bedrock is flysch, metamorphic rock, marl or limestone or igneous rock? In your model the probability of landslide occurrence is the same whatever the lithology? I could not disagree more!

Reply: The paragraph was modified in the reversion. Followed the suggestion, we modified the regression model in high-frequency landslides.

Alluvim formation was used for the reference category in high-frequency landslide. Model result shows that the lithology is also a significant variable for landslide frequency (Table 1).

Table 1 Logistic regression models with entire, low- frequency and high- frequency landslides

Variable	Entire landslides		Low-frequency landslides		High-frequency landslides	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Lithology		<.001		<.001		.001
Metamorphic					0.66	.003
Alluvim	0.45	<.001	0.55	<.001		
Hoshe	0.50	<.001	0.54	<.001	0.54	.008
Nanchuang	0.57	<.001	0.62	<.001	0.67	<.001
Wetness index	7.61E-02	<.001	7.41E-02	<.001	0.13	<.001
NDVI	-28.42	<.001	-21.94	<.001	-39.45	<.001
Elevation	-1.53E-03	<.001	-1.37E-03	<.001	-1.61E-03	<.001
Slope	2.94E-02	<.001	2.54E-02	<.001	3.36E-02	<.001
Distance to faults	1.40E-04	<.001	1.12E-04	<.001	1.40E-04	<.001
Distance to rivers	1.31E-04	<.001	1.30E-04	<.001	1.10E-04	.010
Distance to roads	1.60E-04	<.001	1.75E-04	<.001	#	#
Distance to built-up lands	1.83E-04	<.001	9.61E-05	<.001	4.40E-04	<.001
Const.	6.61	<.001	4.43	<.001	6.07	<.001
ROC	0.829		0.806		0.946	