

Dear Referee,

Thank you for your kindly providing all these helpful comments. Our replies and the corresponding future works are all listed below.

Comments to author:

No.	Comment	Reply
1	The paper is very poorly written, with a bad English. Several typos are present everywhere in the text. Moreover, the use of past and present tenses is hardly understandable. Several sentences are not clear at all. I suggest a strong revision of the paper in this view, possibly with an editing by an English native speaker.	Thanks for the comment. We will carefully check again and ask for the editing by an English native speaker throughout the manuscript.
2	The introduction could be improved by reporting and analyzing some works that have dealt with regional early warning models and early warning systems for landslide occurrence, e.g. Segoni et al. 2014; Calvello et al. 2015, Devoli et al. 2015; Piciullo et al. 2017; Pumo et al. 2017.	Thanks for the comment. We will analyze and add these important references in the revised introduction.
3	The “Data and method” section can be improved by adding more details on data gathering. As an example, it is not clear how Authors identified rock falls from the landslide inventory. Moreover, Authors state that they gathered landslide occurrence time by inquiry residents during field investigations. This should be clarified, in particular because the occurrence time of the landslides is very important for the reconstruction of the 3-hour mean rainfall intensity. In addition, more details on the definition of landslide inventory would be useful. Furthermore, it is not clear why the Authors calculated a precipitation map for the whole study area. What is it for?	Thanks for the comment. We will split “Data and methodology” into “Available data” and “Methodology” so that more details can be described in each section. For the identification of rock fall from the landslide inventory, we deleted the polygons that situated in the slope whose gradient is higher than 55 degrees according to the classification rules proposed by Central Geological Survey, Taiwan. For gathering landslide occurrence time by inquiring residents during field investigation, we tried to interview residents with impressive memories, especially whose family was injured or house was destroyed by the landslide, so that the quality might be improved. Besides, a more detailed

		definition including the classification and procedure of landslide inventory will be added in the revised manuscript. The precipitation map was produced for the purpose of analyzing landslide susceptibility by using logistic regression. We will add all these descriptions in the revised manuscript.
4	Nothing is said about rainfall data. Did authors use rain gauge series? If yes, please explain how many rain gauges.	Thanks for the comment. Yes, we used rainfall data from rain gauges. Their distributions are shown in Figure 1, but the numbers were not included in this manuscript. We will add this to the revised manuscript.
5	The whole section regarding the landslide susceptibility analysis (section 3.2.1) should be rewritten and increased by adding more information. Several details on the adopted method are missing.	Thanks for the comment, we will rewrite this section and ask for the editing by a native speaker again. We will also add more detailed procedures in the revised version.
6	In the section on rainfall thresholds, Authors refer to a coefficient of variation (also reported in Table 4); please explain how it was calculated.	Thanks for the comment. We will add the equation of coefficient of variation in order to explain how the calculation was made.
7	In the “3.2.3 landslide early warning model” section, it is very strange that 30%, 60% and 90% thresholds correspond exactly to integer values of I_3 (30, 40, 60) and R_{24} (300, 400, 600). Is it just an example? Please explain.	Thanks for the comment. The original values were calculated from 30%, 60% and 90% thresholds respectively. After that, I_3 was rounded by 5 mm/h and R_{24} was rounded by 50 mm for operational purpose (e.g. evacuation). The original value and the rounded value are shown in Table 6. We will add these explain in the revised manuscript.
8	In the section related to the results of landslide susceptibility analysis, the values of AUC are not so high to justify that “the results showed that LR model was stable and nice in training as well as validation” (Page 6, line 20). I suggest rephrasing this sentence, acknowledging that results could be better. Moreover, I suggest avoiding the	Thanks for the comment. For statistical landslide susceptibility analysis, it is essential to use as many samples as possible. However, we used slope units instead of grid units in this study for the purpose of the application on disaster prevention. This leads to the reduction of samples since one slope unit might equal to

	word “nice”, here and elsewhere in the text.	hundreds of grids. Therefore, our AUC might not be so high compared to a grid-based landslide susceptibility model. We will replace the word “nice” with “acceptable” and elsewhere in the revised manuscript.
9	At the end of section 4.2 (page 7, lines 8-13), several actions to be performed in case of different warning levels are reported. This step leads from an early warning model to an early warning system; therefore, it should be remarked.	Thanks for the comment. We agree these suggested actions lead from a model to a EWS. Now we also develop a system connecting to near real-time radar rainfall data for disaster prevention. We will remark these in the revised manuscript.
10	Regarding validation of the model (Section 4.3), I would suggest using some indices or scores (e.g., count – and ratio – of correct and incorrect predictions, True Positive Rate, ROC analysis, etc.) to quantitatively evaluate the performance of the validation procedure.	Thanks for the comment. We agree that quantitative evaluation of the performance of early warning model is necessary. We will calculate the number of false alarms, correct alarms and missed alarms to make a complete validation of our model.
11	Conclusions section is very short! Authors should add the main findings and the lesson learnt from their work. I suggest increasing a lot this last section.	Thanks for the comment. We will increase the contents of conclusion and all major findings will also be included in this section.
12	Figure 1: add more descriptions in the caption.	Thanks for the comment. We will add more detailed descriptions of the elements in this figure.
13	Figure 3: not useful for the discussion. I suggest deleting it.	Thanks for the comment. We will delete this figure.
14	Figure 5: in the label of y-axis, pleas change “hr” into “h”.	Thanks for the comment. We will change the label and the word we used in the manuscript.
15	Figure 6: it’s a repetition of Figure 8b (for moderate susceptibility areas); I suggest deleting it.	Thanks for the comment. We will delete this figure.
16	Figure 7: I would suggest the following labels for x- and y-axes, respectively: “Portion of areas predicted as hazardous” for x-axis, and “portion of landslide	Thanks for the comment. We will change the label in Figure 7 according to your suggestions.

	occurred” for y-axis.	
17	Figure 8: I suggest enlarging it, and distribute the three panels vertically. Moreover, please add a), b) and c) to the three panels.	Thanks for the comment. We will enlarge this figure and distribute them vertically. Besides, we will add (a), (b), (c) and the 90%, 60%, 30% threshold label in each panel.
18	Tables 5 and 6: I’m not sure that colours can be used in tables in NHESS journal. I suggest converting them into two figures, if Authors want to maintain colours.	Thanks for the comment. The colours are essential for understanding the warning signs. Therefore, we will follow your suggestion and convert these tables into figures.
19	References: Please add DOI to each reference in the list.	Thanks for the comment. We will add DOI for each reference.
20	As I already stated, the manuscript is full of technical and grammatical errors, typos, and incorrect use of words. Here I list just some suggestions of technical corrections, but again I suggest a check and a language revision of the whole text.	Thanks for the comment, we will carefully check the manuscript and ask for the editing by a native speaker.
21	<ul style="list-style-type: none"> ● Page 1, lines 29-31: please check this sentence and rewrite. ● Page 3, line 9: correct “form”. ● Page 3, lines 15, 22, 23, 30: please check plurals (e.g., slope units, landslides,: : :). ● Page 3, line 23: please check and correct the sentence “This study used slope unit that based on the features of : : :”. ● Page 4, lines 11-12: please reword. ● Page 6, line 5: unclear, please rewrite. ● Page 6, lines 22-26: this sentence is unclear, please reword. ● Page 7, line 3: replace “rounded to” with “rounded by”. ● Page 7, line 22: correct “form”. ● Page 7, line 25 and following: authors mention “14th”, “15th”, and others; if they are days, I suggest using the format dd-mm, which results more clear. 	Thanks for pointing out these unclear sentences and typos. We will correct them with caution in the revised manuscript.

	● Page 8, line 4: “once landslide”, what does it mean? Please correct.	
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