

A m e n d m e n t s t o P r o o f (R e v i e w e r # 2) D a t e : 2 0 1 6 / 0 8 / 2 4

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Reference No: **nness-2016-127**

Paper Title: **Evaluation of Environmental Factors in Landslide Prone Areas of Central Taiwan using Spatial Analysis of Landslide Inventory Maps**

| Item No. | Original Paper | | | Comments | Author's Response |
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| | Page | Line | Text | | |
| 1 | 6 | 17-19 | - | The aim of the study should be mentioned in the abstract and the introduction not in the description of the study area (p. 6 lines 17-19) | Thanks for the comments. The authors will remove the aim of the study from the study area and properly highlight it in the introduction and abstract. |
| 2 | 6 7 | 26-31 1-17 | | There are repetitions of information on the usage of the results for further work which should be mentioned only ones. (i.e. p.6 lines26ff.) | Thanks for the comments. Information on the usage of the results would be reduced to only represent the standpoint of the Section 3. |
| 3 | 40 | | | There are many figures added which are not essential for readers support. Especially figure 4 is unnecessarily because it is hardly mentioned in the text. A legend is missing and does not give an additional input to the reader | Thanks for the comments. Figure 4 is a sketch image rendering map that illustrates a source of satellite imagery acquirement. The author will add legend to figure 4 and also introduce the importance of satellite imagery acquirement related an event to increase the readability of manuscript. |
| 4 | | | | Please list all input data clearly with citation of the source and if available the resolution/scale for which they are suitable. | Thanks for the comments. The author will add a table to list all of used data and its information including time, citation of the source, resolution/scale and the application. |
| 5 | 10 | 7 | | Try to present complete lists p.10 line 7 "GIS layers such as roads. Also describe their preparation (eg. buffer of roads) Maybe it makes sense to have an own chapter to <u>describe data and data preparation</u> . Used aerial photographs supporting the image identification should also be listed by date and citation. | Thanks for the comments. The authors will add a graph to present the used GIS layers and describe the step "Importation of Satellite images and references" in Subsection 3.2.1. Also, all of the used GIS layers and aerial photographs supporting the image identification will also be listed by date and citation. |

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| 6 | 10 | 22 | <p>On p.10 lines 22: I would like to know more about your work of classification and hierarchy and tree structure and not what should have been done.</p> | <p>Thanks for the comments.</p> <p>The classification and hierarchy and tree structure for landslide detection by interface of the used automated program will be illustrated into graph as schematic layout in the revised manuscript</p> | |
| 7 | | | <p>Results: Landslide distribution in figure 8 there are landslide areas which are not only rising during the time. See areas post earthquake Chi-Chi (1999/10/31) total area of 18.767ha whereas pre typhoon Toraji (2011/01/20) the total landslide area is 14.465ha. How do you explain this issue?</p> <p>In figure 9 there is a gap in post-typhoon Toraji and pre typhoon Mindulle. This issues would have been interesting to be discussed.</p> <p>How do you consider this circumstances in the following procedures for the landslide potential map?</p> | <p>Thanks for the comments.</p> <p>This study establishes the event-based landslide inventory using multi-stage satellite imagery interpretation for Chushui and Aiyuzih subwatersheds in the Shenmu area which only involved ten extreme meteorological events and one extreme earthquake event.</p> <p>The period of post earthquake Chi-Chi (1999/10/31) to pre typhoon Toraji (2011/01/20) have not suffered high prolonged rainfall event so the decreased landslide areas can be attributed to the effects of environmental natural vegetation recovery which increases a slopes ability to mitigate</p> | |

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| | | | | | <p>landslides or from a geotechnical standpoint improves the factor of safety of the slope.</p> <p>Similarly, post-typhoon Toraji and pre typhoon Mindulle has no significant rainfall events so that the decreased areas can be attributed to the effects of environmental natural vegetation recovery. Secondly, the procedures for the landslide potential map in our manuscript is aimed to present and delineate the future landslide for areas which have well-vegetated land cover and presently have no evidence of landslide activity.</p> <p>Accordingly, the authors will rewrite these sentences to make it clear.</p> |
| 8 | 20 | 11 | | Figure 13 represents not elevation as mentioned on p.20 line 11. The figure shows slope classes. | <p>Thanks for the comments.</p> <p>The figure number will be corrected as “12”.</p> |
| 9 | | | | Human activity: p.23 Line 7 and after in the discussion p. 24 line 19 you mentioned that human activity causes minor or irrelevant landslide contribution. There should maybe discussed the fact, that the area is located in a very steep and mountainous part of Taiwan | <p>Thanks for the comments.</p> <p>The area where the majority of landslides are found in Shenmu is generally a very steep and mountainous part of Taiwan where human activity is minimal and causes irrelevant to minor contribution to the total landslide area of Shenmu. The author will add the sentence to explain the above.</p> |
| 10 | | | | <p>Generally in the results and discussion chapters the final landslide potential map as the final result is mentioned very shortly.</p> <p>It is mentioned on p.16 line 6 “: :this section utilized a dataset of complete and reliable landslide inventory maps of Shenmu area: :.” How do you validate your working steps? In general validation of any of your results is required. Landslide potential maps of the different time periods are particularly suitable to evaluate and discuss the model as well as the outcomes.</p> | <p>Thanks for the comments.</p> <p>The author will follow your suggestion to remove relevant information and reconstruct the Discussion and Conclusions sections based on main obtained results. In addition, landslide potential map of the three temporal periods pre-1999 Chi-Chi earthquake, from 1999 Chi-Chi earthquake to pre- and post-typhoon Morakot would be also discussed and validated in the revised manuscript.</p> |

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| 11 | 18 | 21 | | Additionally editing remarks. The Name "Uchiogi" in the References is spelled differentially than in the text "Uchiughi". P. 18 line 21 "Fig. xx" needs a correct numerical value | Thanks for the comments. That is a misspelled word. The text "Uchiughi" of the manuscript should be amended as "Uchiogi" according to the references. And, P. 18 line 21 Fig. number is "11". |