Natural Hazards
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Discussions

Interactive comment on "Risk Factors and Perceived Restoration in a Town Destroyed by the 2010 Chile Tsunami" *by* Carolina Martínez et al.

Carolina Martínez et al.
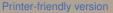
carolina.marine@gmail.com

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Abstract: 1. Include the objective of the paper in the abstract.

Answer: It was incorporated into the following sentence: Therefore, the objective of this research is to analyze the risk factors that explain the disaster at that time as well as perceived restoration 6 years after the event.

2. The description of the perceived restoration study, which is not a common and widely known topic, is not clear.

Answer: A perceived restoration study was performed to assess the effects of reconstruction on the community. It consisted of evaluating the capacity of the new neighborhoods to provide restorative experiences in case of disaster by asking community

members to assess 15 items associated with the Being Away, Fascination and Compatibility factors found in the Perceived Restorative Scale. A 1-7 Likert scale was used during the evaluation.

3. Separate the use of "factor" from references to vulnerability.

Answer: It was decided to use this term to refer to risk. "Variable" was used to refer to vulnerability.

4. Use of the idea that "these areas will probably be destroyed again."

Answer: It was decided to eliminate this sentence.

Methodology - Vulnerability and risk assessment:

1. The vulnerability pre- and post-tsunami variables associated with each dimension could be cited in the text.

Answer: This was not deemed necessary since the variables are indicated and detailed in Table 3.

2. The authors should justify why some variables were modified according to pre/post-disaster conditions.

Answer: This justification appears in lines 170 and 180. Some of the variables used in pre-disaster conditions were from the 2002 census; however, census data regarding was unavailable for the same variables for post-disaster conditions. Therefore, it was decided to select representative variables for each dimension of vulnerability. In Chile, the next census is planned for 2017.

3. The authors should justify why some variables were modified according to pre/post-disaster conditions. Why are the authors not using the same variables? Is it due to lack of data? Scientific approach? Are pre/post-disaster conditions comparable measuring different variables? The authors should clarify whether this decision affects or not the final results.

Answer: Due to the lack of post-disaster census data, some variables were not similar for pre- and post-disaster conditions for the same analysis unit. It was attempted to overcome this difficulty by incorporating representative variables for each dimension of vulnerability. This aspect was added to the Discussion section, between lines 441 and 446.

4. It is not clear if (and how) the vulnerability assessment combines the vulnerability variables and the perceived restoration study or not. Therefore, it is not clear as well if both analyses feed the risk matrix or not.

Answer: The vulnerability variables were given equal weight in the final matrix since prior studies in the area that included the dimension of vulnerability in risk such as Martínez et al., (2012) and Rojas et al., (2014) used similar criteria, which have proved representative of local conditions. Both studies (vulnerability and perceived restoration) were complementary, but restoration was not included in the vulnerability matrix. The risk matrix considers only risk factors (threat and vulnerability), in accordance with Blakie et al., (1994), and therefore restoration was included only in the principal component and cluster analyses for post-disaster conditions. To improve the presentation of these results, a section was created for the perceived restoration study (line 340).

5. In order to facilitate readers from different disciplines understand the analysis, it should be better explained why the chosen statistical methods are applied. For example, what are the benefits of clustering against other options?

Answer: There are various advantages to using multivariate methods in this type of investigation. Cluster analysis allows similarities and differences between various neighborhoods to be easily observed. Principal component analysis allows better observation of the association of the various analyzed variables with each particular analysis unit.

6. The results provided are not fully understandable. The description of the type of result and the percentages are confusing. Better explanations of the results would

help the reader to better follow the line of argumentation:

Vulnerability pre-disaster:

- High V: 51% of census blocks = 47% of inundated area = 57% of total population - Average V: 73% of households = 61% of inundated area = 67% of total population

Post-event conditions: - Affected: 72% of census blocks = 70% of housing = 73% of total population

Answer: A new paragraph was written to improve this aspect, between lines 372 and 376.

7. Vulnerability post-disaster: analysis of neighbourhoods and restoration values Secondly, the analysis of neighbourhoods presents the clustering which, although useful, is not well justified, neither in the methodology section (why was this method selected? what is it expected to provide?), nor in the results section (what is the relevance of these results besides the fact of grouping neighbourhoods?). Additional explanations dealing with the relevance of the results should be provided.

Answer: This analysis was eliminated from the study. The relevant information for this paper is provided by the descriptive statistical analysis that was performed. It provides information on which neighborhoods are more restorative than others (the old or new neighborhoods) and which elements of the neighborhoods contribute to a restorative experience (natural or built features). This was also clarified in section 3.3.

8. The Conclusions section should also provide some remarks about the contributions of the proposed method.

Answer: A sentence was incorporated into the Conclusions section, between lines 519 and 523.

Technical corrections

P3, line 52. Maybe some words missing, suggestion in brackets: "Although scientific

research has led to significant advances in [the understanding of] the generation and propagation mechanisms of these phenomena",

Answer: The sentence was corrected in accordance with the referee's proposal.

P3, line 81. "...in Chile, however, physical and social dimensions are the least considered in post-disaster planning." However, in p11, line 403 it is said that "This situation is explained by the emphasis on physical rather than social reconstruction..." Do you maybe mean, in line 81, psychological and social dimensions?

Answer: The sentence was corrected in accordance with the referee's proposal.

P5, line 152. "In order to establish which factors determined the achieved hazard level...". According to literature on this topic, the terminology of this sentence is confusing. The vulnerability factors may influence the impacts, but not the hazard level. Please justify.

Answer: In effect, there was a writing problem here. The text was corrected to the following:

Tables need reordering, there are two Table 3.

Answer: Table 3 was reordered.

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-256/nhess-2016-256-AC1-supplement.pdf