

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

Anonymous Referee #1

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General comments The authors analyze in this paper tsunami inundation risks pre- and post-disaster in one of the coastal towns most affected by the earthquake and tsunami on Feb. 27, 2010, which presented an intense transformation as a result of post-disaster reconstruction. They aim at understanding whether this reconstruction process has reduced vulnerability and provided a restorative urban system, which enhance urban resilience, or if it has generated new risk areas.

The topic is of relevance for this journal and for the international scientific community since reconstruction processes are usually not assessed and/or compared with the situation before the event. This information could be relevant to optimize reconstruction and to avoid repeating the same mistakes in urban planning.

The paper is well structured. However, some minor changes are required.

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Specific comments

The abstract needs additional work since (1) it is lacking the objective of the paper. Without the objective, the listing of technical tasks carried out does not give the reader an overall understanding of the work; (2) the description of the perceived restoration study, which is not a common and widely known topic, is not clear; (3) there is a confusing use of terms, i.e. “risk factors”, “vulnerability factors”, “these factors constitute the same risks..”. The authors should be consistent along the paper with chosen terminology; (4) the statement “these areas will probably be destroyed again” is too assertive, considering the existing uncertainties other type of expression may be more adequate.

Methodology - Vulnerability and risk assessment:

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

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.

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?

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

C2

- 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

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.

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

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",

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?

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.

Tables need reordering, there are two Table 3.

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