

Review of the paper “A spatial multicriteria prioritizing approach for geohydrological risk mitigation planning in small and densely urbanized Mediterranean basins” submitted to NHESS by Guido Paliaga, Francesco Faccini, Fabio Luino, Laura Turconi

General Comments

Following the proposal made by the authors the article deals with the proposal of three groups of indicators to constitute a priority scale to support the long-time planning interventions at catchment scale. The authors propose 18th indicators that group in: environmental factors-natural evolution (set 1); environmental factors-anthropogenic impact (set 2); social factors (set 3). They obtain this information for 21 little catchments of the Liguria Region and apply the multicriteria analysis technique. The authors include a long list of references to support their paper.

Although the topic of the paper is interesting and could be applied to other similar catchments in Mediterranean Region the paper lacks of information about the selected criteria and methodology. On the contrary, the paper seems a technical report for local policymakers, giving so much detail for each basin that is not necessary in an international publication and does the reading of the paper difficult. It is not necessary to detail the features and results for each basin. You could select the most relevant ones as example of the methodology.

In conclusion, in my opinion, this paper deserves publication in NHESS after major changes. Please, take into account my previous comments and the following ones. I would recommend that English language would be reviewed by an English native translator.

Abstract:

The abstract needs to be improved, both from the content and the redaction (i.e. “giving a **support** tool for decision makers, **supporting** a strong scheduling”). I would recommend including more specific information about the region of study, the database and methodology as well as results. On the contrary, the first introductory paragraph (Lines 17-33) could be shortened and the last one (Lines 32-35) should be modified because it does not transmit a clear message. Why do you say “obtaining the optimization of economic resources”? I have not seen any economic analysis, neither the relationship of this analysis with the three set of parameters.

Introduction

Please, make a deep review of the Introduction. For instance, you say three times practically the same: “due to particular characteristics of geology, geomorphology and climate that can induce a high geo-hydrological hazard” (Page1, lines 40-42); “the general climatic context, with the interface between cold air masses and the sea, a steep territory and a complex geomorphologic and geologic context are the main natural factors” (Page 2, lines 53-55); “the general climatic context, with the interface between cold air masses and the sea, a steep territory and a complex geomorphologic and geologic context are the main natural factors” (Page 2, lines 59-61).

On the other hand Mediterranean region is the interface between cold air masses from the North (Atlantic or Continental) and warm subtropical and tropical air masses. The role developed by

the sea varies along the year, but the most important is the strong potential instability at low levels that characterize the Mediterranean air mass, as well the high water vapour content.

The paragraphs included from line 40 to line 93 show a general introduction about the Mediterranean region, and flood and landslides hazards. This is not bad; however, some references to other scientific works performed with spatial multicriteria analysis or dealing with support tools to plan long-term interventions at catchment scale, should be included in the Introduction, in order to know the state of the art.

Data and methodology:

Some aspects of the methodology deserve clearer and more elaborate explanation:

- Which is the meaning of the acronyms “IFFI, AVI, CTR, DSGDS,...”? Which is the source of the flood hazard map? Ad the source of all the information used in the paper.
- Which period do you use for the “Flood data from the AVI archive”? (write “flood data”, not “floods data”)
- Where are included social data (population density, economy data,...)?
- How do you characterize the risk level? It does not appear in the paper. Please, explain it.
- Why you have selected these indicators? Have you published a previous work with them? Is there any literature about it?
- The most important contribution for the scientific community would be the parameters selection and the multicriteria methodology. However, the only information that appears about them is the list of parameters and that “the S-MCA has been performed through the geo-UmbriaSUIT plugin available in Quantum GIS software, and the software performs a TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution) multicriteria method (Huang and Yoong, 1981)”. But, which is the philosophy of this methodology? How do you justify the classification showed in Table 7? Is this software free for all the public? The reference is old; do you have any more recent reference about this methodology? How do you rank the priorities?
- Which kind of survey have you made? Which was the target people?

Discussion

As I have proposed in the General Comments it would be interesting to select some catchments as example to show the methodology and to discuss the potential solutions (structural and non-structural) that could be adopted for each one.

Which mitigation works would be proposed depending of the scale of priorities showed in Table 7? It would be interesting to introduce a figure or a table showing the classification of priorities, the indicators or set of indicators that each priority considers and the potential solutions that could be applied. Discussion could consider if they are urban catchments or not, economic and ecological limitations, or the potential acceptance of the population

Minor changes:

Page 1, line 19: Authors say “The high hazard is often associated to intense urbanization...” but urbanization also affects vulnerability and exposure. Please, substitute the term “hazard” by “risk”.

Page 4, line 154. Add a parenthesis to “fig. 3)”

Page 4, line 156. I think that “present both the lithology” should be “present both lithologies”.

Table 6: The caption of the table says that “using parameters k, l 674 and m (ref. Tab. 2);”, but they do not appear in Table 2. The same with “parameters a through j”.

Page 5, lines 192-194: You say “due to the Mediterranean cyclones that periodically spring and intensify from south of the Alps over the Gulf of Genoa in the Ligurian Sea”. In spite that this phenomenon is correct, usually and due to the orography of the region, there are a great part of the events that comes from the Mediterranean (with or without a cyclone in surface). The main cyclogenesis is over the sea on the Gulf of Genoa.

Page 5, line 205. Please, add a reference to justify these values.

Page 6, line 220. Please, substitute “their” by “its in the text: “because of their contributing effect to risk”.