

We would like to thank Referee #2 for his/her interest in the topic and for valuable comments to improve the manuscript. A point-by-point response to the comments is as follows.

R: Referee

A: Authors

General comments:

R: (...) In accordance to this aim, its flexibility really allow its adoption to different case studies, but only to individuate particular criticisms in flood prone areas at the meso-scale: the implementation of the Flood Directive at the micro-scale requires inevitably a more detailed analysis.

A: We agree with this comments. The revised manuscript (conclusions) has been modified accordingly.

R: Regarding its use to measure the benefits of different scenarios, it is immediate to understand how it can compare scenarios with different hazard magnitude, but it is not clear how it compares different settings of (structural and especially) non-structural mitigation and adaptation strategies.

A: The methodology allows the comparison of different scenario where structural and/or non-structural adaptation measures are considered. These measures can affect (change) both the hazard magnitude as well as the exposure and vulnerability patterns. For example, the installation of an Early Warning System allows to decrease the vulnerability of the area (AV, see Eq. 3) and, therefore, the relative risk to people, while the re-calibration of the river cross section can contribute in decreasing the hazard metrics (water depth and velocity).

R: In the introduction you put the accent on the importance of an interdisciplinary approach between socio-economic sciences and geosciences, but only in Section 3.1 you explain that RRA considers just physical/ environmental risks (as an eventual input of successive social and economic analysis).

A: We do partially agree with this comment. In fact, this concept is well introduced in the abstract (P7829L9-13). In general, the proposed interdisciplinary approach is declined and actively used within the whole KULTURisk conceptual framework, where the RRA methodology takes its roots, developed and proposed (see Figure 2).

R: In general, the procedure show a high degree of subjectivity specifically when many equation derived for local situations are extrapolated to a general use. Could the authors supply some clarifications in term of procedure generalization?

A: The procedure generalization is performed when considering the risk estimation (in terms of hazard, exposure and vulnerability patterns) that are receptors-dependant and, in most of the cases, based on experimental studies. A certain degree of subjectivity is unavoidable, and the scope of the paper is to propose and integrated and comprehensive methodology for an overall (risk) assessment at the meso-scale level. As agreed above, the implementation of the risk assessment at micro-scale requires a more detailed analysis and, probably, a different (refined) set of equations.

Specific comments:

R: Section 3.4.1: There is a graph or a scale to understand which range of H_{people} indicates high or low hazard level for people?

A: No, the normalization procedure is performed for this purpose: to compare and rank the different hazard and risk levels.

R: Page 7840, last word: it's table 7, not 6!

A: We agree with this comments. The revised manuscript has been modified accordingly.

R: Section 3.5.1: At meso-scale it's ok to consider the same classes for all residential and commercial building, but is it sufficient for public buildings as hospitals, schools, airports..?

A: Yes, since at this scale only the physical (in)stability of buildings is assessed, without any consideration of the specific function and service they provide.

R: Section 3.5.2: You don't consider the water depths when evaluating risk for infrastructures. Which is the lower boundary condition? (a water depth equal to 5 cm on roads has to be considered in such an analysis?)

A: Lower boundaries are not considered at the moment, since the “out-of-service configuration” is assessed and this depends on the specific drainage capacity of the roads-railway network, very difficult to assess at meso-scale level. However, if data were available, an in-depth analysis could be reasonably performed and a lower boundary to characterize the functionality of transport infrastructures could be pointed out.

R: Section 3.5.3: You don’t consider flood duration while assessing risk to agriculture. Maybe you could, at least, consider the topography and the consequent stagnation to increase susceptibility scores, as you do after for natural and semi-natural systems.

A: We agree with this comments. This aspect could be considered in a revised (updated) version of the methodology.

R: Section 3.6.1: The final susceptibility score to natural systems is given by experts: there is not an objective way to calculate it considering the elements which influence it? Moreover: when you introduce the “probabilistic or” function, you can refer to the appendix A (at the end of the paper, where you explain it).

A: We agree with this comments. The revised manuscript has been modified accordingly, with new tables and scores.

R: The paper is, in general, well organized and clear, apart: Section 2 “Approaches and tools on flood risk assessment” could be probably merged with the Introduction Section 3.3: there are only references but nothing new on the methodology.

A: We do partially agree with this comments, since the Section 2 is functional to introduce the overall state-of-the-art on available risk assessment methodologies.