

## ***Interactive comment on “The KULTURisk Regional Risk Assessment methodology for water-related natural hazards – Part 1: Physical-environmental assessment” by P. Ronco et al.***

### **Anonymous Referee #2**

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This paper proposes a Regional Risk Assessment methodology for water-related natural hazards. This methodology is based on the estimation of a relative risk index for different elements at risk (receptors) at the meso-scale and only regarding the physical/environmental dimension. Its aim is to be used as an instrument to communicate to decision makers and stakeholders the potential implications of floods in non-monetary terms, as first step to implement the last European Flood Directive. 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

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analysis. 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. 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). 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?

Specific comments – Section 3.4.1: There is a graph or a scale to understand which range of Hpeople indicates high or low hazard level for people? – Page 7840, last word: it's table 7, not 6! – 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..? – 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?) – 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. – 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).

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

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