

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1  
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## Comment on nhess-2021-88

Anonymous Referee #1

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Referee comment on "Longitudinal survey data for diversifying temporal dynamics in flood risk modelling" by Elena Mondino et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-88-RC1>, 2021

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Dear authors,

the paper with the title „Longitudinal survey data for diversifying temporal dynamics in flood risk modelling“ address a very interesting topic, not only in social science with the use of longitudinal methodological approaches to understand mid-term/long-term changes within a community in terms of flood risk management. The paper fits to the scope of the journal. I have some questions and remarks on the paper, which might need a larger more in-depth assessment of the current status of the paper. In overall, there are some major and minor remarks to the paper.

A first overall remark reflects your conceptual framework, aim of the paper, discussion and literature review. The first point I would re-consider within the current version is the question about the use of theoretical framework. The paper needs to re-think to add theoretical-psychological framework (or frameworks) to assess and to explain your results, which theoretical concept (besides the socio-hydrology framework) are you using: Protective Action Decision Model (PADM), Risk Information Seeking and Processing model (RISP), Framework for Risk Information and Seeking (FRIS), Planned Risk Information Seeking Model (PRISM), Protection Motivation Theory (PMT), Transtheoretical model (TTM), Health Belief Model (HBM), Social amplification of risk framework (SARF), Model of Private Proactive Adaptation to Climate Change (MPPACC), Regulatory Focus Theory (RFT), Theory of Reasoned Action (TRA), or Community Engagement Theory (CET)? I would strongly suggest choosing one of these theoretical frameworks to re-consider your aim of the paper as well as your discussion. What I'm largely missing is: what's the innovation in your paper, what's the theoretical added-value of your paper; I see large potential within the paper, but at the moment this isn't addressed, such as aim of the paper reads more like providing some new case studies; I largely missing a theoretical debate within your paper, which needs to be addressed within your aim of the paper. This goes also hand in hand with your literature review, which included a wide range of papers from socio-hydrology community (which is fine), but none of these papers are really talking about risk perception (in terms of theoretical contribution!). Please, provide a broader risk perception debate within your paper. Another point, what are the differences of this paper with your already published work in Journal of Hydrology and Hydrological

Sciences Journal? Some minor points: also reconsider some structural aspects, such as within the discussion: you are talking about risk perception paradox, but this isn't mentioned in your introduction, similar aspect is the 'white male' effect; you should mention and explain this concepts already in your introduction. Important issue: what's your theoretical added value to the current psychological debates on risk perception and coping strategy and adaptive capacity?

Second point goes directly to your data and used methodology: I would suggest providing much more detail information about the sampling: how you selected them, who drop out, why, how etc. Also, I would re-think about your used methodology in analysing your data: you are using a very descriptive approach with some Chi-Square assessments: I would suggest providing a more sophisticated statistical analysis, such as using a series of hierarchical regression models as there is much more potential within your dataset. In addition, the paper only address the social part of the socio-hydrology modelling framework. I would suggest including at least some information about the hydrology issue and risk analysis from the events, including social and physical vulnerability assessment of your sampling and selected case study. In particular, you mention a very interesting point, mainly low damage and preparedness. At the moment, it's largely unclear what does it mean low damage, low damage in terms of physical vulnerability, in terms of social vulnerability, in terms of a combination of both, see for example your statement on page 18, on the line 520? I would strongly suggest to include both vulnerability concepts in the revised version to understand your assumption about low damage/high damage; we need much more information about your sampling.

Third issue reflects your results section. First, the sections are too short; some of the sections only include 100-200 words, as NHESS has no upper word limited I would suggest to extend this part. Second issue reflects two key results sections: mainly, the private protection measures and insurance. First to the private protection measures: this is too far unclear what you are asking them: did you asked them to use PLFRA? Did you asked them to implement emergency management activities? Which measures did you asked them? This section needs more detail information about the type of measures, how they implemented it, the role of self-efficacy etc.? Second aspect reflects your insurance section: as far I remember, the Italian government didn't introduced the Monti law about natural hazards insurance or is there any private or mandatory natural hazard insurance system in Italy or is the government providing the disaster aid payments? If not, you probably will always get some wrong impression from your results on insurance like other surveys in other countries, such as Austria, Germany, Czech Republic etc. where people associate household insurance bill with a natural hazard insurance bill, which isn't correct as in Germany, for example, most insurance companies are not providing any compensation; the disaster payments are provided (usually) from the public administration. I think this might cause some misunderstandings for many readers across the globe (especially Anglo-Saxony countries) where the private insurance market plays a central role in the recovery. I'm not sure about this sections, it might be worth to remove it.

Fourth issue goes to your statements about system dynamics and ABM. First of all, I don't think ABM might the solution to include individual risk perception or human behaviour aspect. As most (or almost most) ABM studies are using a stochastic approach to explain individual behaviour, main reason is that all humans are rarely acting within a swarm like in biology. Secondly, how you would integrate your results within current SD modelling

frameworks, such as Vensim or Stella? It's more me a little bit vague how you argue; please provide a much more detail information about it.

Minor points:

Please provide more in-depth information on table 1, such as population composition to understand how your sample reflects the population.

Page 9, line 238 restriction to one person within the household: I see this as a very problematic issue as we know from previous studies the factor of gender in the rural-side play a crucial role in the data; I don't like this fact you exclude the others from the household. Therefore, I would suggest to add this aspect as a crucial limitations in your paper.

Page 13, line 376: you are using cluster analysis: how did you organise the cluster analysis within this very small sampling? It's somehow unclear for me.

Page 18, line 498: please provide some cross-references on the ABM section. Similar later on SD.

What I'm somehow missing are the role about the Italian civil protection in the case study; does the civil protection system in Italy influencing your preparedness as well as understanding of risk perception?

Finally, please provide some further limitations within your study as well as next research steps within the longitudinal research in flood risk management.