

Nat. Hazards Earth Syst. Sci. Discuss., author comment AC2
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Reply on RC2

Costanza Bonadonna et al.

Author comment on "Assessing the effectiveness and the economic impact of evacuation: the case of the island of Vulcano, Italy" by Costanza Bonadonna et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-301-AC2>, 2022

Dear Reviewer 2,

We thank you for all your comments that helped improve our manuscript. Please find below a detailed reply to all your comments.

Line 242, line 317: Gas emissions should be also mentioned (see the recent crisis of Vulcano in September-October 2021).

Gas emissions have been highlighted in section 3.1. Geological settings and implications for evacuation planning

Line 649 and 730-739: Regarding partial evacuation it should be considered that, according to what is reported in lines 194-199, the area of Porto hosts some critical infrastructures as the main power plant, ie: not only "touristic infrastructures".

Of course, most critical infrastructures are located in Porto. However, here we mention the touristic infrastructure because the economic assessment is based on economic turnover related to tourism

Line 689: The evacuation by foot does not allow transporting heavy baggage or other goods (such as the car). This could be accepted by the people in case of imminent risk for life, but probably not in case of a preventive evacuation. Are you considering the evacuation by foot for simulation purposes (ie: a model approximation), or you consider that this is, in any case, the best solution? Since this could be a critical point for the evacuation model, probably it needs a better description.

Thank you for the very good comment. We assume that evacuation by foot is the main evacuation mode for the sake of simulation. However, a combination of evacuation strategies (both by foot and motorized vehicles) could also be and will certainly be considered in the future with this simulation tool.

Line 691: "people with disabilities are considered in the simulations by using a low walking speed". This seems not very realistic, considering that elderly or disabled people could have serious walking problems. This approximation can be considered for simulation purposes but probably it is not realistic for an evacuation plan.

We agree with this comment. For the sake of these preliminary simulations, we decided to make some easy assumptions such as this one. However, we agree that for a more accurate simulation, more specific assumptions for people with disabilities should be made (e.g. integrating evacuation with motorized vehicles). We have clarified this point in section 6.1:

- iv) people with disabilities are considered in the simulations by using a low walking speed; however, other considerations could be made in order to improve the analysis (e.g., integrating evacuation with dedicated motorized vehicles),

Line 711: I think that a partial evacuation of a given area could have also a psychological impact on the tourists and residents living in neighbouring areas, triggering, probably, a spontaneous evacuation of other zones. Did you consider this situation?

This can also be a possibility not considered in the current simulations. We have added a clarification in section 6.1:

viii) people follow the instructions provided in the evacuation orders (this is particularly important for staged evacuation as people in each community are asked to evacuate according to their turn; the possibility of having a fraction of the population not following the order of staged evacuation can be included in the simulations in order to add a level of uncertainty)

Line 715: Please, specify here if you are considering only the costs related the activities indicated in Tables 4-6 (which do not consider other possible turnover related to shops, transports, services, etc.)

We have specified in the caption of Table 7 that these data are based on Tables 3, 4 and 5

Lines 713-720: It should be considered that an evacuation during the "low season" could affect or compromise also the "high season", due to the typical maintenance works of the touristic infrastructures performed during the low season and the impact on the activity of hotel booking, etc.

This is an interesting remark. We added a paragraph to address this aspect:

It should also be considered that an evacuation during the low season could affect or compromise also the high season, due to the typical maintenance works of the touristic infrastructures performed during the low season and the impact on preparation touristic activity (e.g. hotel booking). However, eruptions also attract tourists, as recently shown by the 2021 crises of Cumbre Veja (La Palma, Spain) and Fagradalsfjall (Iceland). As a result, the overall impact on the high season revenue of an evacuation during the low season due to an eruption of La Fossa would be difficult to forecast.

Lines 873-874. Considering the uncertainties, expressing the evacuation times in minutes (with 1 minute resolution) seems not very realistic. Probably reporting times in hours with almost one decimal digit could sound better.

Thanks for this comment. We now provide the time both in minutes and hours.

Typos:

Lines 250 and 784: Ricercheof -> "Ricerche of" (insert space)

corrected

The citation "Bonadonna et al., 2021" is ambiguous since the References report two papers with this reference. Probably you could resolve the ambiguity by labelling them 2021a and 2021b.

We removed one of the references that is not relevant for this paper