Dear editor,

In this contribution, Rodríguez-Espinoza et al. present an analysis of the economic impact associated with potential eruptions in two Ecuadorian volcanoes (Imbabura and Cuicocha). I think this manuscript presents a lot of critical issues from a volcanological point of view, and also in terms of redaction and reproducibility. I would like to raise the following points:

- As a reviewer, I do not understand what is the volcanological reason and field observation that supports the reference scenarios. Where are the deposits of these references in the volcanological record? The analysis of the volcanological significance of the studied scenarios is completely absent in the manuscript, and is only based on considerations of the VEI associated with these two volcanoes. This is extremely simplistic, VEI is a measure for volcanic eruptions, not for characterizing the nature of a volcano, with the potential of generating a series of volcanic scenarios. They also address two extremely different scenarios (VEI 2 and VEI 6) for two volcanoes whose links are not discussed at all.
- Moreover, there are features of the proposed hazard maps that make me think there are numerical artefacts, or problems related to an insufficient number of simulations. Numerical modeling is really obscure. What are the inputs parameters of simulations? How many simulations did you performed? Are you considering depth and time variations of wind field? It seems the authors are not considering these issues.
- There are several recent advances in numerical modeling and probabilistic hazard assessment that are not incorporated in the adopted methodology. I could mention lots of papers leaded by Sandri, Tierz, de' Michieli Vitturi, Tadini, Kelfoun, Pardini, etc., that stress the relevance of considering the aleatory and epistemic uncertainty of volcanic processes in the construction of hazard maps. This is not considered or discussed.
- The assessment of hazard and risk is not presented in terms of the terminology that this problem involves (risk, hazard, vulnerability, exposition and so on). This represents a significant inconvenience to follow the manuscript.
- I identified some issues in the reference list that should be solved. All of them are indicated in the commented PDF attached in this review.
- English should be improved in several parts, especially in the introduction.

All in all, I suggest to reject publication of this manuscript. There are several aspects that should be addressed or discussed in detail and it is not aligned with the standard of recent studies of fallout hazard assessments and the standard of this journal.

Dear expert reviewer, thank you for your comments and advices about our manuscript, we may respond to all of your valuable points, step by step and simultaneously, you may find various improvements based on your input on the attached PDF file.

RESPONSE TO REVIEWER #1

Within the very first point of the review, the expert reviewer mentions that he/she cannot find a reason for the reference scenarios. After strong and critical thoughts, we must admit that he/she is absolutely right, as we made a mistake because it should be much clearer right from the first line what has been the predominant objective of our current study. We should make clear that our research was and is the assess of the direct economic impact of potential volcanic eruptions of two chosen volcanic centers surrounding an important Ecuadorian canton and city. The reason on concentrating in the economic impact has been as there is a huge lack of any profound economic analysis in previous studies around the world regarding volcanic eruption. Even though after any natural hazard disruption practically all governments try to recover as soon as they are able to, to

the normal / regular economic activity. This is extremely important in terms of people affected by such natural disruptions of their lives and socio-economic activities. In terms of the volcanological significance of the scenarios, once again, we realized to have committed a mistake that our concentration is on the direct economic impact. Yet, the given comment by the expert reviewer helped and allowed us to understand that we were not clear enough of what we really wanted to present in the first place. As you will be able to see, that this mistake has been corrected within the new version, rewriting the entire introduction, leading to a much better version of our goals and intentions, as we concentrated on the economic impact of the potential volcanic eruptions in the supposed worst-case scenario of our study area.

The second observation the reviewer indicated towards that the proposed hazards maps are numerical artifacts or related to an insufficient number of simulations. We need to clarify that hazards maps were used to locate the potential impact areas in order to determine what kind of economic activities are taken place in that region, which allowed to estimate the economic direct impact. There was no simulation of any model, as this was not even necessary or needed at all. Our best guess is that the expert reviewer referred to figure 2 and desired to understand how we came up with such a graphic. Therefore, yet, we did specify in the text really clearly that we used more than (now) 16 thousand satellite images from 1999 to 2025 of five active volcanoes surrounding the two volcanoes of our study area, in order to determine which would be the direction of the ash fall if the eruption of these two volcanoes would occur. This data set is one of the highlights of our manuscript, as these are real data of real existing volcanic eruptions and their corresponding direction of ash falls, applied to "our" studied volcanoes of the same region. There is not any model from the literature we used to determine that, it's as explained our own afford. We used only satellite images of past/recent volcanic eruptions in Ecuador to determine ash fall patterns. It may be simplistic as the expert reviewer mentions, but it has been extremely precise and very efficient in terms of our proposed goal.

The third concern was that we didn't used advance modeling and probabilistic hazard assessment. Yet, as now it is very clear from the first line, we are and were interested in determining the direct economic impact of a potential volcanic eruption. We were not looking when it would potentially occur, so the references suggested by the expert reviewer as important they may be, did not really contribute to our objective at all.

The expert reviewer mentions that our assessment is not presented in terms of hazard, risk and vulnerability, which would be related to a given risk management. The expert reviewer is correct mentioning, that our assessment is in terms of economic impact, which appears after the natural hazard occurs. Unfortunately, any management risk assessment lacked to be the any of the objectives of the present study.

The expert reviewer mentions a regard about the references. Well, his/her observation were obviously considered, what we are thankful for and we reviewed all our references, so they are properly cited in the text and within the reference section.

Finally, the expert reviewer mentioned that our English should be improved in order to be published adequately. This suggestion has been welcomed, so we have asked our native English speaker to review our text and to improve it significantly and correspondingly. We also used Gemini AI of Chrome to review the grammar and orthography as an additional edition of our text and we included this activity in our acknowledge section.

Once again and with all due respect, we are very thankful for the comments and corrections of the expert reviewer, which helped to see a few unclear parts and or even faults of our side within our manuscript. With his/her comments we were able to smooth the text, clarify missing parts or wrong spellings, which resulted to an improved and much better than the initial version of this current study.

Thanks a lot on behalf of all authors