

We are grateful to reviewer 2 for his insightful comments on our paper. We integrated all provided suggestions on typos and wording. In addition, we have addressed the more extensive comments below.

- **Comment 1:** *Line 39: and northernmost Chile-Bolivia? (if the northern segment is north of Isluga then it includes the northernmost part of Chile). Otherwise, you should talk about a northern segment only in Peru and not from Isluga north*

**Response:** Thank you for pointing this out, we incorporated your suggestion (line 39).

- **Comment 2:** *Line 72: but does Szakacs give an age limit between young and old?*

**Response:** they only mention “Quaternary for young extinct volcanoes”.

- **Comment 3:** *Line 90: also all 16 volcanoes of the Peru ranking I guess? Could add this*

**Response:** Thank you, we have included this in line 90.

- **Comment 4:** *Line 111: Please check, I think Andes generally considered to have started its evolution/growth in the Jurassic*

**Response:** We agree, we have incorporated the suggested details (lines 111-112).

- **Comment 5:** *Line 116: 'ridge' doesn't seem the correct term here*

**Response:** Thank you, it is modified now (line 116).

- **Comment 6:** *Line 117: what do you mean by 'neotectonic'? This term is usually used for very young, recent, tectonic activity. But the control on volcanism, of arc segments, etc, was controlled by older processes, not by present-day neotectonics.*

**Response:** We incorporated this term following Stern (2004) (page 167). Here, they refer to neotectonic, as for motions and deformations related to the dip of the subducted plate, the obliquity of convergence and the thickness and composition of the continental crust during the Quaternary. We replaced “neotectonic” by “Quaternary” to avoid misunderstandings (line 117).

- **Comment 7:** *Line 345: not so clear, maybe 'making them useful.'*

**Response:** This sentence has been incorporated (line 345).

- **Comment 8:** *Line 353: not clear, you mean differences between the results VRR 0, VRR 1 and VRR 2?*

**Response:** Yes, we have added this to avoid any confusion (line 353).

- **Comment 9:** *Line 354: not so clear, consider re-writing, maybe something like 'considered, with the more densely populated areas obtaining higher socres...'*

**Response:** We have incorporated your suggestion (lines 354).

- **Comment 10:** *Line 355: could add 'identifying or highlighting those volcanoes that xxxxxxx'*

**Response:** Modified, thank you (line 355-356).

- **Comment 11:** *Line 357: results rather?*

**Response:** We have included this clarification in line 357.

- **Comment 12:** *Line 362: why 'however'? because they look more hazardous in the maps? maybe say this, e.g. 'Although El Misti and Parinacota are located in xxxxx zone in the maps, they occupy only...'*

**Response:** We have incorporated your suggestion (line 362-363).

- **Comment 13:** *Line 379: I think clearer would be to say something like 'focusing only on volcanoes with eruptions in the last 1,000 years...'*

**Response:** We have incorporated your suggestion (line 379).

- **Comment 14:** *Line 392: and similar VRR-0, maybe could add*

**Response:** Now it is included (line 392).

- **Comment 15:** *Line 392: not clear what these examples show? one has high vulnerability and the other low vulnerability?*

**Response:** These examples show volcanic systems with similar threat (i.e., VRR-0, H×E) but different vulnerabilities.

- **Comment 16:** *Line 393: why systemic? this term needed here?*

**Response:** Because systemic vulnerability groups several parameters, the term is needed to refer to all these parameters avoiding mentioning them all (i.e., lack of redundancy of and restrict accessibility to transportation, power, water, telecommunication, emergency facilities and critical facilities).

- **Comment 17:** *Line 411: not clear why 'however' here, rather should be 'Also', or something similar.*

**Response:** Modified, thank you (line 411).

- **Comment 18:** *Line 411: not clear here, maybe delete, or re-write*

**Response:** Modified, thank you (line 411-412).

- **Comment 19:** *Line 431: I think all this not needed, the colors and references are already in the figure caption.*

**Response:** This sentence has been deleted, thank you.

- **Comment 20:** *Line 467: score in our work, and hence, although its vulnerability is lower...*

**Response:** Modified, thank you (line 467).

- **Comment 21:** *Line 468: not clear, you mean that you defined a higher density than Guimaraes for Ticsani?.*

**Response:** Yes, this sentence has been clarified (line 468).

- **Comment 22:** *Line 476: why table 4? I think only table 5*

**Response:** Agree, we deleted table 4 (line 476).

- **Comment 23:** *Lines 492-494: not clear here the difference between the two rankings, you should make the link, e.g. The largest differences for these two volcanoes are caused by the lower vulnerability scores in our work because we considered this and that, whereas Guimaraes did not.*

**Response:** In this section we have simplified the analysis as best we can but indeed, to understand the main reason of this difference it is necessary to review the raw data of both rankings. The full and detailed explanation would be as follows. Putana and Lullaillaco, appear in the 1st and 2nd position of the VRR-2 of Guimarães et al. (2021) and only in the 6th and 17th positions respectively of our VRR-2.

Putana has the same hazard score in both works, but higher exposure, lower vulnerability and higher resilience score in this work, which leads to a lower overall VRR-2 in this work with respect to Guimarães et al. (2021). The reasons are that in this work 1) population density within 100 km radius from the main crater is  $> 100$  inhab/km<sup>2</sup>, 2) water infrastructure first appear in 100 km radius; and 3) telecommunication infrastructures first appear in 30 km radius from the main crater. Therefore, scores in our work are 2, 1, and 2, respectively for these exposure parameters. While in Guimarães et al. (2021) scores are 1, 0, and no data, respectively. The biggest differences are found in the vulnerability factor though. In our work 1) the typology of buildings within 5 and 10 km radius from central volcano scores 0; 2) the proximity of Putana volcano to the geographic border is within 100 km, therefore scores 1; 3) since power and telecommunication infrastructures are  $\leq 1$  within 100 km radius from the main crater, the lack of redundancy for these parameters score 1; 4) since the number of means of transportation to access to power, telecommunication, emergency and critical infrastructures

are  $>1$  within 100 km radius from the main crater, they score 0; and 5) since multiple economic activity/sources are found within 30 km from the main crater, the score is 0. Whilst in Guimarães et al. (2021) scores are 1, 2, 1, no data, 1, no data, 1, and 2. According to our updated information, there are hazard maps with different hazards described in one map for Putana volcano (Amigo et al., 2012) therefore scores 2, while in Guimarães et al. (2021) scores 0.

Regarding Lullaillaco volcano, it has a lower hazard and vulnerability scores and higher exposure and resilience, leading to a lower overall VRR-2 in our work with respect to Guimarães et al. (2021). The reasons are that in our work 1) the maximum VEI of Lullaillaco is 2; 2) the eruption interval of events with  $VEI \geq 3$  is 0; 3) there is no evidence of Holocene pyroclastic flows from Lullaillaco; and 4) it has lahar potential. Therefore, our scores for these hazard parameters are 1, 0, 0, and 1, respectively. Whilst Guimarães et al. (2021) scores are 2, 1, 1, and 0. Regarding exposure, in our work 1) population within 100 km radius from the main crater of Lullaillaco is  $>1$  inhab/km<sup>2</sup>; 2) water and telecommunication infrastructures first appear in 100 km radius from the main crater. Therefore, our scores for these exposure parameters are 2, 1, and 1. While in Guimarães et al. (2021) scores are 1, 0 and 0, respectively. As for Putana volcano, the biggest differences for Lullaillaco are also found in the vulnerability factor. In our work 1) the proximity of Lullaillaco volcano to the geographic border is within 100 km, therefore scores 1; 2) since transportation, water, and telecommunication infrastructures, and emergency and critical facilities are  $> 1$  within 100 km radius from the main crater, the lack of redundancy for these parameters score 0; 3) the power infrastructures are  $\leq 1$  within 100 km radius from the main crater, therefore the lack of redundancy scores 1; and 4) since the number of means of transportation to access to power, emergency and critical infrastructures are  $>1$  within 100 km radius from the main crater, they score 0. Whilst in Guimarães et al. (2021) scores are 2, 1, 0, 1 and 1, respectively. Finally, regarding resilience, our updated information shows that there are hazard maps for Lullaillaco volcano (Amigo et al., 2012) therefore scores 2, while in Guimarães et al. (2021) scores 0.

- **Comment 24:** *Line 515: doesn't sound good, maybe 'the timeliness of data'*

**Response:** This sentence has been modified, thank you (line 515).