

## **Response to referee #2.**

Dear Referee,

Thank you very much for your valuable and constructive suggestion to improve our manuscript. We have addressed all suggestions and revised the manuscript according to the comments. Please find our detailed response as follows.

**Referee Comment 1:** I apologise for the lateness of this review. This is a very interesting paper that provides some great insights into the cultural practices around Mount Bromo. The data is novel and adds an important case study to the global literature on volcanic hazard impacts

**Response1:** Thank you for this positive and inspiring comment.

**Referee Comment 2:** However, there are two areas in which the paper should be improved prior to acceptance. First, the authors should discuss the concept of "open risk" in more detail and with reference to the hazards geography literature

**Response 2:** 'Open risk' does not refer to including socio-economic aspects in natural hazard and risk conceptions, but to including positive aspects of risk. In this regards the referee's suggestion to compare an open risk concept to a cost-benefit analysis is very useful. We have now made this explicit within the discussion. (Please see page 15; line 9-13, line 31-34, Page 16; line 1-5). (Also see our response to Comment 4)

**Referee Comment 3:** The written English needs quite a lot of attention. There are many sentences in the paper that lack grammatical sense to the point where they are difficult to understand

**Response 3:** We have addressed this issue and hope the language used is now acceptable. (Please see our new draft in the supplement materials)

**Referee Comment 4:** The call to "open up" the view of risk that prevails in volcanology (the "technical-rational" model) is not new. Social scientific studies of volcanic eruptions and the affected populations have long called for greater focus on the cultural interpretation of volcanoes and there is also a considerable body of literature that examines the role of volcanoes in national identity. Some of this literature is cited in the paper, but there are also some important omissions - notably the work of Greg Bankoff and Kevin Hewitt in hazards geography. The final section of the discussion in particular needs reframing in light of this literature

**Response 4:** We appreciate the suggested literature and feel it indeed strengthens our argument considerably. Particularly Bankoff's discussion on the Eurocentric nature of the discourse on disaster supports our point of local interpretations of disaster that weigh negative and positive outcomes differently. The notion of disaster as transformative agent is clearly documented and appreciated within our interviews with members of affected communities. Hewitt's analysis of disaster as threat of cultural annihilation clearly establishes the link between disaster and culture, however, in the case of the Tenggere the absence of disaster would lead to their cultural annihilation. We have added to the manuscript accordingly. (Please see page 11; line 29-31, Page 12; line 1-5, Page 13; line 5-8).

**Referee Comment 5:** In the social sciences, the contingency of risk is well known. The contribution that this paper makes is not in trying to redefine risk. It is much more about the relationship between people and land and identity. Another perspective on this would be through the lens of cost-benefit

analysis: the authors' state that the Tenggerese regard the good risks as compensating the bad risks. This is very similar to the cost-benefit approach. The difference lies in the cultural basis of the reasoning. On the issue of identity and volcanoes, there is a 2013 book by Sean Cocco entitled "Watching Vesuvius" that seems to be relevant here

**Response 5:** We feel that the paper indeed contributes to redefine risk. The contribution is made in two steps. 1.) We argue that risk bears not only negative but positive aspects that need to be accounted for. This is absent from current risk concepts. The suggested cost-benefit lens in fact describes the mechanism by which this is done and the Tenggerese provide a vivid case study for decision making based on careful weighing off between positive and negative effects. 2.) The weighing off of negative against positive outcomes must go beyond the economical and thereby beyond a classical cost-benefit analysis to include such aspects that cannot be monetised, e.g. spiritual well-being, belief, identity. In our view it is necessary to include such aspects of positive risk outcomes in a new approach to disaster risk management. (Please see Page 8; line 22-23; line 27, Page 15; line 31-34, Page 16; line 1-5, line 20-21, Page 17; line 1-2).

**Referee Comment 6:** The earlier part of the discussion identifies five "socio-cultural benefits" of volcanic eruptions. This is interesting, but it would be useful to have some more details as to how the authors arrived at these themes. The link between their study and the literature is not entirely clear

**Response 6:** The five socio-cultural benefits are derived from cultural adaptations that have been identified in the literature and partially been confirmed in our field research. We argue that these adaptations should be reframed. Rather than an adaptation to cope with a negative impact they should be considered benefits in their own right, which must be weighed against negative impacts. An exposure to negative impacts may be worthwhile in order to obtain these socio-cultural benefits. (Please see page 13; line 19-23).

**Referee Comment 7:** It would also be interesting to have some more details on the cosmology of the people on Mount Bromo - there is a lot about cosmology in general in the discussion, but again the links are not completely clear

**Response 7:** We agree that the cosmology of the Tenggerese is a very interesting subject. The centrality of Mt. Bromo informs much of the Tenggerese decision making with respect to risk and natural disaster hence the ethnological references in the paper. However the focus of this paper is not an anthropological one but a more general human-volcano system interaction analysis. Deeper consideration of cosmology would go beyond the scope of the paper and the journal.

**Referee Comment 8:** The language of the paper is problematic throughout, but particularly in parts of the discussion, where I cannot make sense of some of the sentences. The manuscript requires extensive copy-editing

**Response 8:** We have corrected language throughout the paper and feel it is now in a state that the argument is not obstructed. Should this still be the case we would appreciate the pointing out of concrete sentences that provide difficulties.

**Referee Comment 9:** I am still uneasy about whether or not interviewees can be identified in this MS - if there is only one "head of the village", and then surely they can be identified?

**Response 9:** Thank you for this comment. We have changed the text accordingly. (Please see Page 7; line 25, Page 8; line 4, Page 9; line 1-2; line 18-19; line 24, Page 10; line 1, line 12-13, Page 11; line 3).