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## **Comment on nhess-2021-164**

Julie Morin (Referee)

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Referee comment on "Risk communication during seismo-volcanic crises: the example of Mayotte, France" by Maud Devès et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-164-RC2>, 2021

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### **General comments**

This is an interesting paper that makes an important contribution by documenting a long-lasting seismic-volcanic crisis on the important matter of risk/crisis communication challenges between different actors. It is even more interesting that the case study is associated with diverse levels of scientific uncertainties and complex socio-economic, political and cultural contexts.

The illustrations provided are great (some additional figures/tables might help the reader to go through the paper - see the specific comments).

The paper does however need to be improved before publication. To this end, I think that there is room for:

- a stronger literature review on volcano/sismo risk communication in general, and specifically on long-term crisis, 'invisible' events, and small island contexts;
- a more robust presentation of the methodology;
- and a clarification of the criteria you have chosen to differentiate the different phases of the crisis/communication (1, 2, 3, 4 / A, B, C).

In addition to these three general comments, I suggest many other minor revisions in the specific comments provided below.

Note that I am not a native speaker. For this reason, I am unable to say whether the language is good enough to be published or whether it needs to be reviewed by a native speaker first.

### **Specific comments**

I.18 – People are exposed to hazards, not to risks

I.19 – are local/national authorities – or even the scientists - included in “people” if the absence of known historical event is the criteria to suggest naivety?

I.31 – I would remove “very” which is questionable (very active in regard/compared to what?)

I.34 – detail what BRGM means. Please be explicit and consistent each time you refer to a new acronym in the paper (the whole name, always either in English or French – pick up one of the languages and stick to it)

I.42 – new insights to be found in the papers recently published on Mayotte e.g. Dofal et al. 2021?

I.43 – an active volcano monitored by a network probably rather than studied

I.45 – you could probably mention that Karthala erupted several times in the past decades (see Bachelery et al. 2016) as it has been providing a regional experience of volcano crisis management and communication

I.63 – hazards instead of risks

I.69 – since when are the episodes of civil unrest happening?

I.69 – Can you provide a reference to sustain the population’s distrust statement?

I.77 and 78 – is it necessarily true that there is no human memory given that 45% are Comorian and that the Grande Comore Island counts an active volcano with rich historical activity?

I.79 – what is Tifaki Hazi? An agency specialized in opinion surveys? To be clarified

I.80 – explicit what DIRMOM is

I.93 – explicit here that it is a seismology citizen group as you do I.136

I.94 – “quickly become very active in the public discussion”: what does it mean? What is the timeframe? How many posts? How many people involved + which proportion of the population are represented?

I.119 – Can you provide an average value?

I.129 to 131 – Why are you stating that this announcement only partially meets expectations?: how? Which specific expectations are met or not? What does change with and after this announcement? Please provide the full meaning of REVOSIMA in French.

I.152 to 155 – Refer to the section of the paper in which you detail this (at this point, as a reader I am just thinking “but is communicating/supposed to communicate/ and how?”)

I.170 – it is now widely recognized that there is no such thing as “natural risks”, natural should be put in quotes

I.177 – There is a need to develop further the references here. Other papers specifically focused on volcanic risk communication can be included.

I.183 – From part of the population: can you specify if this is either/both a significant number and a representative sample of people?

I.202, Figure 2, "Feelings of the population" section – Did Fallou et al (2020) quantify the feeling of improved communication, and how? Can you relate their results and/or explain the scale you have adopted?

I.213-221 – I think the paper would greatly benefit from developing further the literature review on several topics:

- volcanic hazard and risk communication is widely studied in fundamental papers by (e.g. but not limited to): Barclay, Bird, Bretton, Gomez-Zapata, Haynes, Hicks, Hudson-Doyle, Thompson, etc.

- risk communication on "invisible" threats

- lessons learned in terms of volcanic risk communication in other small island/oversea territories contexts

I.252-255 – It is unclear at this stage (and need to be clarified) if these 4 stages correspond to qualitative or quantitative gaps / evolutions in the response/decisions/policies. It is specifically confusing to describe the communication aspects as phase 4 while risk and crisis communication are necessarily involved at all stages (should they be considered as effective or not).

L.276 – Do you mean "ordered" or "classified" rather than "coded"? Unless I misunderstood the methodology, I think the data was not coded. If it was, there is a need for describing this further in detail.

I.281-283 – what type of correlation did you do, which main specific functions of R did you use?

I.287 – Specify how you did make the content analysis (which type of coding have you used, etc.)

I.291 – Please provide a grid (table of bullet points) of the semi-structure interviews, with at least the main questions

I.294-295 – Please harmonize the way you refer to the actors. The Ministries names are

provided in French l.85-86 while here they are in English, which might lose your reader. Same l.457 to 459. + l.686

l.303-305 – I think it is important to mention if those selected citations are representative/randomly selected/picked-up specifically to illustrate your statements, etc., that is to say to further explain how you discriminated the citations you chose to use (e.g. did you focus only on the descriptions of the communication gaps, or did you make a full qualitative content analysis and then picked-up a few topics – in which case it has to be described).

l.307-311 – These details should be provided much earlier in the paper, when you first mention STTM (and you could just write here something like “As stated before, STTM is not representative of the whole population...”)

l.313 - An additional figure showing the organisation of governance and the theoretical channels of communication between the different actors (including citizens) would greatly help the reader going through the paper (maybe in two times: before/after REVOSIMA was born?). It should be placed early enough in the paper to go easily through all the acronyms provided.

l.322-323 – Please explain better why you did choose to ignore the Mayors’ communication: was it too complicated to collect the few communication they did? Or did you collect it but the low number or the contents are too anecdotic to allow this data being analysed? It is important to explain this as many other actors have not communicated much during the crisis as evidenced in Table 1.

l.363-366 – Is the decrease in the number of felt earthquakes real or could it be that the citizen got tired of reporting it or other events on the island make the reporting process less likely? You could probably add a sentence to make this clear.

l.382 – Specify if the territory to which the lock down applies (island/national scales?)

l.390 – Local/national authorities?

l.393 – What do you mean by “voluntary commitment”? BRGM and other institutions have no legal obligation to provide interpretations to the authorities? Please specify.

l.439-440 – Detail what OBS and GNSS mean and which sort of data they are intended to

provide.

I.460-461 – If you do not detail this later in the paper, please provide the information here: how many schools/classes/kids involved? Who won the competition? If the name has not been displayed yet, you could maybe provide a footnote displaying the reasons why.

I.507 – After reading the whole section, I would suggest to replace “analysis” by “description of the scientific and official communication” (same I.526).

I.529-531 – I think it is important here to better explain how you have defined the 3 phases ABC (qualitatively, quantitatively, which criteria?). For instance, currently, when looking at Fig 4, I immediately wonder why the phase A does not stop when the very intense phase of communication by only two main actors ends in July 2018.

I.553 – Communication being one major component of the risk management process, you might want to add this first public press release on Fig 3.?

I.564 – Is the switch to “crisis monitoring” only a communication process or a whole change of organisation to deal with an ongoing process (and in that case what does this imply?)

I.575 – “expert body” = do you mean BRGM, name clearly the experts involved to avoid any confusion

I.611 – I am not sure that the example provided (falling down stairs) can be qualified of nor associated with the idea of misbehaviour (the current research on disasters produced by social psychologists develop the idea that any behaviour is sustained by personal logics themselves rooted by many factors and that there is generally no such thing as a misbehaviour – even when the behaviours do not align with the ones the authorities or other people would expect). For that reason, I would probably just say behaviour.

I.706 – Could one example of leaflet be provided in the supplementary materials? If you know about it, you could probably add a sentence on the way this new documentation has been perceived by the citizen.

I.723 – Is directly mentioning a name aligned with your ethics approval?

I.728 – Municipalities instead of communes?

I.739 – What do you mean by “But the case is quickly closed”? Please, clarify.

I.750 – Can you provide a number of occurrences to allow the reader understanding what “largely commented” means?

- 764 – Probably specify released “online” because the reader is wondering how it is released until having the information at the end of this paragraph

I.815 – what are these possible scenarios?

I.850-852 – Do you know if the STTM network had an indirect access to it, and/or how the documentary is perceived by the scientific, authorities, and citizens?

I.879-888 – How are these points developed by Lindell and Mileti concretely translated in Mayotte? It currently looks a bit disconnected from your case study. To better “follow” your reasoning, it would be very helpful to read a summary of the different questions addressed (or not/ or partially) for the Mayotte case during the different phases you have identified. This summary might eventually include, as you have done it in other sections, the objective communication provided by the actors vs. the perceived communication by the population.

I.894-896 – Is this thirst confirmed through the STTM content analysis? Maybe remind if you mean a qualitative, quantitative thirst, or both.

I.931-932 – Is the increased difficulty to understand data uncertainties your own interpretation or is or based on a content analysis? Please make it clear.

I.951-954 – I think this side note on mass panic is a bit out of the scope as it apparently does not apply to Mayotte territory, where the problem is “just” a worried population seeking for information. I would probably remove this.

I.958 – The capacity for resilience has to be proved. I would probably just talk about coping here, more than resilience.

I.999 – risks = hazards ??

I.1007 – please provide a short summary of those scenarios (and if this is meaningful, when each scenario was established/evolved)

I.1044 – “they have a moral, if not legal”: please provide a footnote to explain the sismo-volcanic science/legacy aspects in the French territories (till which end are the scientists/authorities legally responsible in terms of information?)

I.1079-1080 –I think I disagree with you on this specific point. How do you discriminate the part of the population able to understand? Isn't it the role of good scientific communication to provide several levels of reading so that everyone has access to the information?

I.1093-1100 – It would greatly strengthen this paragraph to provide some bibliographic references, as the literature on disaster risk reduction includes many common arguments.

### **Technical corrections:**

I.2 – should be either “during sismo-volcanic crises” or “during **a** sismo-volcanic crisis”

I.381 (figure) – in phase 3 : gas**s**, and phase 4: gouvern**ment**, dete**ction**, gaz

I.388 and 404 – 3 = Three

You mention I.439 OBS while I.450 OBS**s**

I.441 – University of **La** Reunion



l.488 - 8 = eight

l.500 = lock downs

l.637 - **N**ovember **D**ecember

l.689 - 4 = four

l.859 - **an** inter