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Participatory approach to adapt scientific communication to the socio-cultural context: the case of the seismo-volcanic activity in Mayotte

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Population information is key to disaster risk reduction and scientists have a key role to play in that respect. However, implementing effective scientific communication is not trivial. We draw lessons from our experience of the seismo-volcanic crisis of Mayotte, France. In May 2018, an unprecedented seismic activity started in Mayotte. It was found, a year later, to be linked to volcanic activity, and the birth of a huge submarine volcano ~50km off the east coast of the island. The activity is still ongoing and is being actively studied to understand the phenomena and estimate associated risks. But there are large uncertainties, due to a lack of preexisting knowledge as the area had been poorly studied before 2018, and is challenging to instrument. In this context, informing at-risk populations is difficult. During the first months of the earthquake swarm, the perceived lack of information led to strong anxiety and a feeling of distrust towards scientists and authorities (Fallou et al., 2020; Devès et al., 2022). Experts in charge of monitoring, who are mostly from mainland France, are attempting to develop new ways of disseminating knowledge (e.g., a simplified monthly newsletter, translated into local languages). Nevertheless, they struggle to overcome the socio-cultural gap between mainland France and Mayotte archipelago (multilingualism, levels of literacy, precarious living conditions, see Roinsard, 2014). There is thus a need to explore alternative ways of communicating scientific information so that it can reach the relevant audiences more effectively. We present an approach drawing on the expertise of earth sciences and human and social sciences that reverse the classic top-down approach (the latter does not generally work very well, even less so in Mayotte). We first develop visual and interactive information tools to better represent the uncertainties associated with the knowledge produced by the volcanological and seismological observation network of Mayotte (REVOSIMA). We focus on the link between seismicity and deformation, two phenomena whose consequences are the easiest to perceive for the populations. We then train secondary school students, in collaboration with their teacher, on the basis of these materials. Finally we accompany those students, with the help of their teachers, to develop their own scientific dissemination materials with the objective to transmit this information to their family and friends. This method has the advantage of delegating the tasks of translating and disseminating the acquired knowledge to individuals from different

socio-cultural backgrounds on the island who are familiar with the codes and information habits of their respective communities. As this project is still ongoing, we discuss here its conditions of realisation and its contribution to ongoing research on the communication of scientific information in a context of risks and crises.