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THE RELEVANCE OF VOLCANIC HAZARD IN ROMANIA: IS THERE ANY?

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Abstract

Volcanic hazard is ignored in natural hazard studies in Romania because no active volcano is known on its territory. However, the 2010 eruption of Eyjafjallajökull volcano in Iceland and its consequences on air traffic safety across Europe and the whole northern hemisphere dramatically demonstrated that volcanic hazard in a certain area, such as a country, is not necessarily related to the presence of active volcanoes in the same territory. Therefore, target-focused approaches to volcanic hazard should also consider remotely located hazard sources with respect to the target territory. This study aims at compiling an inventory of potential volcanic hazard sources for the territory of Romania, irrespective of their location inside or outside the country. External volcanic sources implying ash-fall hazard from tephra dispersion following explosive volcanic eruptions include the Central Italian field of active volcanoes (e.g. Campii Flegreii and Vesuvius), the active Aegean volcanic arc, the Eifel region of Central Europe (Germany), and Iceland. Geologic evidence of thick tephra deposition from Campii Flegreii caldera (its Campanian ignimbrite eruption at ca. 39 Ka ago) found in southern Romania clearly indicates that such type of volcanic hazard is real. On the other hand, study of the most recent volcanic activity in Romania shows that the last eruptive event, of explosive Plinian type, occurred at Ciomadul volcano at the south-eastern end of the Călimani-Gurghiu-Harghita (CGH) volcanic range (East Carpathians) in a poorly-constrained time interval of 10.7 to 35 Ka in the continuation of a ca. 10.5 Ma southward-shifting volcanic activity along the whole CGH range. A number of peculiar features of the Ciomadul volcano and its environs strongly suggest that the magma plumbing system of this volcano is not definitely frozen: a well-focused and strongest-in-Romania heat-flow anomaly, crustal and sub-crustal local seismic activity, seismic wave attenuation patterns recorded in seismic tomography images, most intense "post-volcanic activity" including mantle-originated gas emanations. All these symptoms allow one to consider that future eruptions from this volcano cannot be ruled out. Dedicated geophysical studies are needed to obtain more basic information on the current status of the magma-generating and plumbing systems of Ciomadul volcano, which is crucial from the viewpoint of volcanic hazard assessment.

Key words: Ciomadul volcano, East Carpathians, explosive eruption, tephra, volcanic hazard

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