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Bromo volcano area as human-environment system: interaction of volcanic eruption, local knowledge, risk perception and adaptation strategy

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People in the Bromo area (located within Tengger Caldera) have learn to live with the threat of volcanic hazard since this volcano is categorized as an active volcano in Indonesia. During 2010, the eruption intensity increased yielding heavy ash fall and glowing rock fragments. A significant risk is also presented by mass movement which reaches areas up to 25 km from the crater. As a result of the 2010 eruption, 12 houses were destroyed, 25 houses collapsed and there were severe also effects on agriculture and the livestock sector. This paper focuses on understanding the interaction of Bromo volcanic eruption processes and their social responses. The specific aims are to 1) identify the 2010 eruption of Bromo 2) examine the human-volcano relationship within Bromo area in general, and 3) investigate the local knowledge related to hazard, risk perception and their adaptation strategies in specific. In-depth interviews with 33 informants from four districts nearest to the crater included local people and authorities were carried out. The survey focused on farmers, key persons (dukun), students and teachers in order to understand how people respond to Bromo eruption. The results show that the eruption in 2010 was unusual as it took continued for nine months, the longest period in Bromo history. The type of eruption was phreatomagmatic producing material dominated by ash to fine sand. This kind of sediment typically belongs to Tengger mountain eruptions which had produced vast explosions in the past. Furthermore, two years after the eruption, the interviewed people explained that local knowledge and their experiences with volcanic activity do not influence their risk perception. Dealing with this eruption, people in the Bromo area applied ‘lumbung desa’ (traditional saving systems) and mutual aid activity for surviving the volcanic eruption.
Keywords: Human-environment system, local knowledge, risk perception, adaptation strategies, Bromo Volcano Indonesia