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Evaluation of volcanic risk management in Merapi and Bromo Volcanoes

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Merapi (Central Java Province) and Bromo (East Java Province) volcanoes have human-environmental systems with unique characteristics, thus causing specific consequences on their risk management. Various efforts have been carried out by many parties (institutional government, scientists, and non-governmental organizations) to reduce the risk in these areas. However, it is likely that most of the actions have been done for temporary and partial purposes, leading to overlapping work and finally to a non-integrated scheme of volcanic risk management. This study, therefore, aims to identify and evaluate actions of risk and disaster reduction in Merapi and Bromo Volcanoes. To achieve this aims, a thorough literature review was carried out to identify earlier studies in both areas. Afterward, the basic concept of risk management cycle, consisting of risk assessment, risk reduction, event management and regeneration, is used to map those earlier studies and already implemented risk management actions in Merapi and Bromo.
The results show that risk studies in Merapi have been developed predominantly on physical aspects of volcanic eruptions, i.e. models of lahar flows, hazard maps as well as other geophysical modeling. Furthermore, after the 2006 eruption of Merapi, research such on risk communication, social vulnerability, cultural vulnerability have appeared on the social side of risk management research. Apart from that, disaster risk management activities in the Bromo area were emphasizing on physical process and historical religious aspects. This overview of both study areas provides information on how risk studies have been used for managing the volcano disaster. This result confirms that most of earlier studies emphasize on the risk assessment and only few of them consider the risk reduction phase. Further investigation in this field work in the near future will accomplish the findings and contribute to formulate integrated volcanic risk management cycles for both Merapi and Bromo.
Keywords: Risk management, volcanoes hazard, Merapi and Bromo Volcano Indonesia