



A New Database Dedicated to Volcanic Hazards and Risks: The atlas of Merapi Volcano, Indonesia

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Merapi volcano is one of the most active volcanoes worldwide. Approximately 1.3 million people live within a radius 20 km from the summit. In the framework of both, the FP7 MIA VITA Project, and the SEDIMER Project funded by AXA Research Fund, we have built a database at the village scale, which includes the elements at risk and the local resources. This unique geospatial database was used to build a series of maps at the scale of the volcano, providing the core of the Merapi atlas.

Designed by the French Laboratory of Physical Geography in Meudon (France) and the Center of Volcanology and Geological Hazards Mitigation in Bandung (Indonesia), this atlas provides a state of the art synthesis of knowledge on Merapi, from the reconstruction of past eruptions and assessment of volcanic hazards to the quantification of vulnerability and capacities. It is pertinent to a broad audience ranging from volcanologists to the Indonesian population interested to learn about their sacred volcano. The primary goal of this Atlas is to provide an essential blueprint for planners and public officials involved in long-term development as well as risk and crisis management.

The atlas contains 63 color plates gathered in 6 chapters: the introduction summarises the geological context as well as the environmental and human context of Merapi volcano. The second chapter pertains to the geology, the past activity, and the volcanic hazards at Merapi. The third chapter is dedicated to the resources offered by the volcano, including agriculture, livestock, and sand mining activities. The fourth chapter focuses on vulnerability and capacities. The fifth chapter provides a reconstruction of the 2010 VEI 4 eruption of Merapi and its environmental consequences. The sixth chapter summarises the socio-economical impact of the eruption, including mapping of casualties, evacuation, building damage, and an assessment of air traffic disturbance. The seventh chapter focuses on rain-triggered lahar activity following the 2010 eruption, and the associated impact at the local scale. In the conclusion, we show how the 2010 eruption of Merapi improved volcanic risk management, through an updated volcanic hazard map, the establishment of a new high-tech monitoring system, as well as the development of community-based disaster reduction measures.

Extensive use of colour in maps at various scales, graphics, and photos, provides a visually appealing synthesis of the hazards and risks at Merapi volcano, one of the most dangerous in the world. This atlas is available online in free access.