



Lahar hazards and risks following the 2010 eruption of Merapi volcano, Indonesia

Franck Lavigne (1), Edouard de Bélizal (1), Noer Cholik (2), Nurnaning Aisyah (2), Adrien Picquot (1), and Estuning Tyas Wulan Mei (1)

(1) Paris 1 Pantheon-Sorbonne University, Laboratory of Physical Geography, Geography, Meudon, France
(franck.lavigne@univ-paris1.fr), (2) Center of Volcanology and Geological Hazards Mitigation, Volcanic Technology Development and Research Center, Yogyakarta, Indonesia

Merapi Volcano (Indonesia), one of the most active volcanoes in the world, is a targeted volcano of the MIA-VITA project (MItigate and Assess risk from Volcanic Impact on Terrain and human Activities), funded by FP7 European Commission since 2008. During this project, a violent explosive eruption has generated pyroclastic flows, surges, and tephra-falls at the beginning of the rainy season in October and November 2010.

Therefore lahar-related disasters are expected to occur in the region, due to at least five factors: (1) the volume of pyroclastic debris likely to be removed by rain in valleys (in excess of 100×10^6 cubic-meters) is much higher than those calculated after more conventional eruptions (less than 10×10^6 cubic-meters); (2) most of the Sabo dam structures have been filled by the 2010 pyroclastic flows or subsequent lahars; (3) the eruption occurred at the beginning of the rainy season, which will be more rainy than usual (rainfall typically 4000 mm per year 1500 m a.s.l.), due to the occurrence of La Niña climatic occurrence in 2010-2011; (4) lahar did not occur in some rivers like kali Kuning or kali Woro for more than 50 years, therefore the risk perception of local people is very limited along these rivers; (5) thousands of sand miners are working extensively in the riverbed of all lahar-prone channels.

For these reasons, lahar hazard is very high below about 450-600 m elevation in each of the 13 rivers which drain the volcano. Several measures were taken by the Center of Volcanology and Geological Hazard Mitigation (CVGHM) to predict the lahar occurrence, to assess the lahar pathways, etc. The vulnerability of the populations living along the threatened rivers will be assessed in the frame of the WP5 of the MIA VITA Project (Socio-Economic Vulnerability and Resilience).