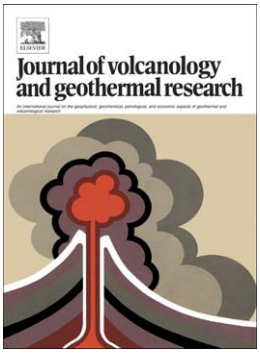

Fluid dynamics inside a "wet" volcano inferred from the complex frequencies of long-period (LP) events: An example from Papandayan volcano, West Java, Indonesia, during the 2011 seismic unrest

Devy Kamil Syahbana, Corentin Caudron, Philippe Jousset, Thomas Lecocq, Thierry Camelbeeck, Alain Bernard, Surono

PII: S0377-0273(14)00140-1
DOI: doi: 10.1016/j.jvolgeores.2014.05.005
Reference: VOLGEO 5322

To appear in: *Journal of Volcanology and Geothermal Research*

Received date: 20 December 2013
Accepted date: 2 May 2014

Please cite this article as: Syahbana, Devy Kamil, Caudron, Corentin, Jousset, Philippe, Lecocq, Thomas, Camelbeeck, Thierry, Bernard, Alain, Surono, Fluid dynamics inside a "wet" volcano inferred from the complex frequencies of long-period (LP) events: An example from Papandayan volcano, West Java, Indonesia, during the 2011 seismic unrest, *Journal of Volcanology and Geothermal Research* (2014), doi: 10.1016/j.jvolgeores.2014.05.005

Fluid dynamics inside a "wet" volcano inferred from the complex frequencies of long-period (LP) events: An example from Papandayan volcano, West Java, Indonesia, during the 2011 seismic unrest

Devy Kamil Syahbana[1,2,3,4], Corentin Caudron[2,3,5], Philippe Jousset[4], Thomas Lecocq[3], Thierry Camelbeeck[3], Alain Bernard[2], Surono[1]

[1] Center for Volcanology and Geological Hazard Mitigation, Geological Agency, Ministry of Energy and Mineral Resources, Jalan Diponegoro 57, Bandung 40122, Indonesia (devy@vsi.esdm.go.id)

[2] Université Libre de Bruxelles, Department of Earth and Environmental Sciences, 50 Avenue Roosevelt, 1050 Brussels, Belgium

[3] Royal Observatory of Belgium, Seismology Section, 3 Avenue Circulaire, 1180 Uccle, Brussels, Belgium

[4] Helmholtz Centre GFZ German Research Centre for Geosciences, Telegrafenberg, 14473 Potsdam, Germany

[5] Nanyang Technological University, Earth Observatory of Singapore, 50 Nanyang Ave, Singapore 639798, Singapore

Abstract

We present results of our study aimed at understanding the dynamics of fluids inside a "wet" volcano through the analysis of swarms of long-period (LP) events accompanying the 2011 seismic unrest at Papandayan volcano, West Java, Indonesia. Prior to this unrest, we measured an extremely high percentage (100%) of CO_2 in the ground at the summit crater, however with a very low value of SO_2 flux (~6 tons/day). Increase in volcanic activity was also observed from the records of a tiltmeter. A long-term inflation was followed by an abrupt deflation that took place concurrently with the swarms of LP events. Thereafter, swarms of local-tectonic (LT) and volcano-tectonic (VT) earthquakes started. We focus here on analysing the LP events with the following manner. First, we estimate the source location of LP events by applying a 3-D non-linear hypocenter localization algorithm which includes