

HDS004-08

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EVALUATION OF OF SINABUNG VOLCANO ERUPTION AUGUST- SEPTEMBER 2010

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Sinabung Volcano located at Karo District, Province of North Sumatera, geographically its summit lies at 03deg 10min North and 98deg 23,5min East. The peak has elevation of 2400 m.asl. The eruption history of Sinabung Volcano does not known well. On August 27, 2010, phreatic eruption occurred. It was a first eruption that continued by another eruption series on August 28, August 29, August 30, September 3 and September 7, 2010. The eruption produced volcanic ash and 1-5 km height of eruption column.

Some methods were conducted to monitor the volcanic activity of Sinabung Volcano such as seismic, geochemistry and deformation using EDM (Electronic Distance Measurement) and Tiltmeter. Seismic monitoring conducted continuously from 4 (four) seismic stations. Three stations use 1 component seismometer while other use 3 components.

The recorded seismic event consist of : Tectonic earthquakes, Local Tectonic earthquakes, Deep-Volcanic earthquakes, Shallow-Volcanic earthquakes, Emission earthquakes and Tremor earthquakes. Hypocenter distribution before eruption on September 7 separated below the crater and north part of Sinabung Volcano with depth of 1-6 km from the summit. After the eruption, it was concentrated precisely below the crater with 1-5 km depth. At the time when volcanic activity decreases (end of September ? October 2010), earthquakes accumulated at Northeast part with depth of 1-9 km. This indicated that the source of earthquakes not only from the volcano itself, but also possible influenced by local tectonic activity that occurred at Northeast highland of Sinabung Volcano.

Flux of SO₂ that was measured simultaneously with the eruption showed sizeable and high pressured volcanic degassing. Result of water chemistry analysis from some water samples around Sinabung Volcano showed high concentration of bicarbonate (HCO₃⁻), chloride (Cl), sulphate (SO₄), and natrium (Na). This indicated the presence of hydrothermal system below the conduit of Sinabung Volcano and also minor magmatic supply.

Tiltmeter measurement noted that there was no significant changes on both radial and tangential components during August-September 2010. It was assumed that pressure equilibrium changes gradually and as implication of this condition, the emission activity at the crater is still ongoing intensely.

Distance measurement with EDM showed slight correlation between slope distance changes and time. From this result, it was assumed that rate of energy release occurred gradually and will take a long time. Deformation at Sinabung Volcano not only as implication of internal energy release but also sensitive to regional tectonic activity, mostly for earthquake that has magnitude more than 5 Mw.

The activity of Sinabung Volcano is getting down this time. Visual observation, seismic activity and deformation monitoring show decreasing activity. However, phreatic eruption and lahar flow is still potentially occur. Some mitigation efforts conducted to antisipate the future eruption, such as establishment The Observatory Post of Sinabung Volcano that full equipped with monitoring equipment, construction of Geological map and Volcano Hazard map, distribution of information and coordination with Local Government.