Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

HDS06-P03 会場:コンベンションホール 時間:5 月 22 日 13:30-15:00

インドネシア・シナブン火山の噴火シナリオ
Eruption Scenario of Sinabung volcano, North Sumatra, Indonesia

吉本 充宏 [1*], 中田 節也 [2], 外西 奈津美 [2], 井口 正人 [3], 大倉 敬宏 [4]
YOSHIMOTO, Mitsuhiro[1*], NAKADA, Setsuya[2], HOKANISHI, Natsumi[2], IGUCHI, Masato[3], OHKURA, Takahiro[4]

[1] 北海道大学理学研究院, [2] 東京大学地震研究所, [3] 京都大学防災研究所火山活動研究センター, [4] 京都大学大学院理学研究科附属地球熱学研究施設火山研究センター
[1]Faculty of Science, Hokkaido University, [2]Earthquake Research Institute, University of Tokyo, [3]Sakurajima Volcano Research Center, Disaster Prevention Research Institute, Kyoto University, [4]Institute for Geothermal Sciences, Graduate School of Science, Kyoto University

Sinabung Volcano is an andesitic stratovolcano located 40 km northwest of Lake Toba, North Sumatra The edifice consists mainly of multiple thick lava flows, lava domes and block-and-ash flow and associated surge deposits. The latest spine is located at the southern end of one of the summit craters trending in N-S. The youngest block-and-ash flow and associated surge deposits derived from the spine distributed at the southeastern flank are considered to be emplaced at ca. 1.1 ka, based on the radiocarbon ages of charcoals in the deposits. The flow deposits reached about 5 km southeast of the vent. Historical eruptions have not been reported prior to the phreatic eruptions during August-September 2010. The latest eruption caused panic among the people living around the volcano.

One of the plausible scenarios for future eruption may be proposed based on the eruption history and the chemical characteristics of the volcano. The geology of this volcano shows dome-forming lava extrusion or lava flowing, being associated with pyroclastic flows (block-and-ash flows or surges) and a debris avalanche, the latter which were generated from partial failure of the lava domes/flows or the upper part of the volcanic edifice. On the contrary, ashfall deposits suggesting relatively large explosive eruptions such as plinian- to subplinian-types were not found, implying no occurrence of large explosive explosions in this volcano throughout its history. Therefore, a dome-forming eruption or lava flowing near the summit is highly possible as a future eruption. During dome growth, partial collapse of the lava dome will generate pyroclastic flows (block-and-ash flows and surges). If a large lava dome grows at the summit crater, the most serious scenario will be a failure of the old and weak volcanic edifice due to the load of the dome. Relatively large-scale collapse of the volcanic edifice may generate a lateral blast preceding the pyroclastic avalanche, such as observed in the 1997 event at Soufriere Hills volcano, Montserrat, where the crater wall on which the growing lava dome overrode collapsed together with a part of the overlying dome. In this scenario significant earthquakes and the flank deformation would be expected several days or weeks before the failure as observed in Montserrat. If magma is less viscous due to low SiO2 content or higher temperature driven by a high effusion rate, lava will flow down on the flank from the summit crater, being associated with minor pyroclastic flows from the flow front. Evolution of scenarios may be tracked and judged by continuous monitoring of volcanic earthquakes and ground deformation.

キーワード: インドネシア, シナブン火山, 噴火シナリオ, ブロックアンドアッシュフロー堆積物, 溶岩ドーム
Keywords: Indonesia, Sinabung volcano, Eruption Scenario, block-and-ash flow, Lava dome