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The Threat of Future Eruption of Kelud Volcano, East Java, Indonesia

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Kelud volcano (1731 m) in East Java is one of the most active and dangerous volcanoes in Indonesia. Since 1925, in order to reduce risk from volcanic eruption Center for Volcanology and Geological Hazard Mitigation (CVGHM) has monitored Kelud volcano. Recently, there are 5 seismic and 1 tiltmeter stations installed at the volcano.
The big eruptions of Kelud volcano (1586, 1901, 1919, 1951, 1966 and 1990) were characterized by initial phreatomagmatic followed by the explosive eruptions. Furthermore, the explosive eruptions of Kelud volcano usually take place in a short time. However, the recent eruption of the volcano on November 4, 2007, was different with the last 100 years ones. It was an effusive eruption as shown by emergence of lava dome in the middle of crater lake.
The change of eruption type of the volcano from the explosive eruption to effusive one has led to a new challenge on how to encounter the future eruption. Since there was a crater lake at the summit, monitoring system was focused on how to anticipate the product of explosive eruption such as ash fall and volcanic bombs as well as how far the lahar would go down and reached the settlement area at the flank of the volcano. As the summit no longer occupied by a crater lake but replaced by a lava dome, volcanic hazard countermeasure should be changed.
As the risk caused by the volcano different from the previous eruption, CVGHM would change the existing Volcanic Hazard Map for the volcano. In addition, it is also necessary to change the perspective of people and local government around the volcano about the threat of future eruption. A huge mass of lava dome might cause the shift of eruption center as marked by a breakthrough of magma through a new conduit. In order to be able to detect earlier a new magma supply a wide area seismic and deformation networks is needed. With those proposals above, we are expected to find out the scenario of future eruption of Kelud volcano as a basis to enhance alertness of people living nearby.

Keywords: Kelud volcano, countermeasure of volcanic eruption, explosive eruption, lava dome