

# Critical review of disaster mitigation for Hakone Volcano and its eruption occurred in 2015

\*Masato Koyama<sup>1</sup>

1. CIREN, Shizuoka Univ.

A critical review was made on the disaster mitigation for Hakone Volcano and its eruption occurred in 2015. Hakone Volcano, one of the active volcanoes in Japan, has repeated phreatic eruptions 5 times since the last magmatic eruption at about 3ka. All these eruptions occurred near Owakudani Valley, which is a famous geothermal area for tourists. A volcanic hazard map, which estimates dangerous areas under a similar situation of the past phreatic eruptions, was made in 2004 by the Hakone Town Office. On the basis of this hazard map, Disaster Mitigation Council for Hakone Volcano made an evacuation plan under each volcanic alert level, which is given by Japan Meteorological Agency. Because all these countermeasures had been prepared before the 2015 eruption, evacuation of tourists and residents was successfully made under the earthquake swarm and abnormal fumarolic activity in the pre-eruption stage. This success, however, was fortunately made under the conditions stated below:

- 1) The 2015 eruption of Hakone Volcano was a weak phreatic eruption, of which discharge mass was only 100 ton. No base surge and no large lahar occurred. Duration of the eruption was short (about 2 days).
- 2) There are 10 plus and 11 minus social factors, which affected the development of the systems and urgent actions for disaster mitigation of Hakone Volcano. Through the history since the early 20th Century, the persons or parties, all who concerned the disaster mitigation of Hakone Volcano, suppressed the minus factors and reinforced the plus factors.

Keywords: Hakone Volcano, disaster mitigation, 2015 eruption, critical review, natural and social conditions, plus and minus factors