Volcanic Alert Levels seen from volcanologists

*Shintaro Hayashi[1]

1. Akita University Graduate School of Education

Eruption prediction: The most important tool for forecasting eruption is seismic observation and observation of crustal deformation. When eruption occurs, some mass transfer phenomena occur. For example, when a large amount of magma moves, it destroys the surrounding rocks and an earthquake occurs. Also, as the magma reservoir expand, the ground around the volcano swells slightly. By observing these changes with a seismograph and GNSS, we can diagnose the condition of the volcano.
Volcanic Alert Level: Volcanic Alert Level(VAL) is an indicator classified into 5 stages. Depending on the situation of volcanic activity the range of evacuation is indicated. VAL 1 is "paying attention to the active volcano", and VAL 5 is evacuation. If the eruption progresses stepwise and the warning level is raised without delay, it is a system that can evacuate the residents. Concerns such as volcanologists, especially when voluntarily adopting warning levels, expressed concern such as "alert issuance will be delayed because alarm is directly linked to social instruction such as evacuation" (Okada, 2008) .
Current status of eruption prediction: How far has eruption prediction developed? There are eruptions that are easy to predict and eruptions that are difficult to predict. An eruption where highly viscous magma moves to a large amount is easy to predict. At the eruption of Usu 2000 , the eruption prediction succeeded and the victim was not. It is possible to predict that such a large eruption will begin.
There are two "weak subjects" for eruption prediction. The first is phreatic eruption. The second is the transition of eruption. In the case of phreatic eruption, hydrothermal water (groundwater indirectly heated by magma, the boiling point exceeds 100 ˚C because the pressure is high) moves to a shallow place,Water boils explosively with decreasing pressure. Hot water that causes eruption has low viscosity and it is difficult to capture its movement. This typical example is Mt. Ontake's 2014 eruption (there are volcanologists with opinion that this eruption was predictable). There is also a big problem about the transition of the eruption. The activity level of the volcano can be diagnosed from the state of earthquakes or other volcanic phenomena, but it is difficult at present to predict how it will change after the eruption begins. A typical example is the eruption of Kuchierabujima 2015. After the small eruption in 2013, volcanic abnormalities such as earthquakes increased, and sulfur dioxide emissions increased, eruption causing pyroclastic flow occurred on May 29, 2014.
Volcanic disaster prevention education: What kind of volcanic disaster prevention education should be done in the current state of such eruption prediction? I want to discuss about two cases here. The first one is a small eruption that only dangers around the crater like Mt. Ontakeyama eruption, and the second one is a large eruption that is devastating a wide area around the volcano like Asama 1783 eruption. Steam eruption like the Ontake 2014 eruption may occur at VAL level 1. Education on emergency evacuation is important when dealing with such eruptions in volcanic disaster prevention education. The basis of the evacuation method is similar to evacuation from the tsunami. Hayashi (2015) expressed as “Escape! Hide!”.
Regarding the large eruption, there is a possibility that a lot of sacrifice may occur if the timing to raise the VAL is delayed, and it is currently difficult to make it as a material for education.

Keywords: Disaster prevention education, Volcano education, Volcanic Alert Level

