Volcanic Hazards: Improving the Science and Communication to the Public

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The scale of disaster is not related directly to the magnitude of volcanic eruption, nor may depend on the technical degree of the monitoring. Especially small phreatic events and long-lasting repeating events make it difficult for people to prepare for the hazards. A small eruption at Ontake Volcano, Japan, in 2014 took 63 lives of climbers who had hardly known the danger of sudden explosions in the fumarolic summit area. Another example is Sinabung volcano, Indonesia, which has sent pyroclastic density currents by frequent partial collapses of a growing lava dome since 2014, and took 16 and 8 lives of local people in 2014 and 2016, respectively, who had invaded into the restricted area. Although these disasters may come from a technical limit for forecasting volcanic hazards, it is clear that the victims had not prepared for the hazards. The latter may be due to insufficient transition of the knowledge and information from scientists to the local people. An abnormal phenomenon, different from precursors of the previous eruptions, had been observed prior to the phreatic eruption at Ontake, while accumulation of instable shape of huge amount of lava on the crater has been observed a few days before large collapses at Sinabung. Scientists try to forecast hazards in multiple approaches by installing equipment with modern technology. Though abnormal monitoring data are detected, however, timely interpretation and forecasting are usually difficult. Volcanic eruptions are much less frequent than climate and seismic phenomena, so that the eruptive phenomenon cannot have been modeled for forecasting like meteorology and seismology. The effective, immediate and realistic way to reduce volcanic risks may not be improving eruptive models by installing abundant monitoring equipment, but, rather, may be rising the social resilience by repeating communication between scientists and all sector stakeholders.