

Early Warning of Volcanic Eruption in Japan

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This section is to share the useful experience in early warning and incidentally, this year is designated as the Disaster Reduction for Sustainable Mountain Development by ISDR International Strategy for Disaster Reduction. In this context, I selected to share with you two cases of successful early warning of volcanic eruption in Japan as today's topic.

The Japanese archipelago is part of the highly volcanic Circum–Pan–Pacific zone. Although the continental shelf where Japan is located makes up only roughly 0.1% of the entire world, the region has 86 active volcanoes, or roughly 10% of active volcanoes in the world, and has seen a large number of disasters triggered by them. As the statistics shows we have several volcanic eruptions almost every year.

The government has dedicated its efforts to the mitigation of damage from volcanic eruptions. In this regard, early warning of eruption is essential. Today, I will tell you about the case of two recent and major volcanic eruptions in Japan, which recorded no casualty thanks to the successful early warning of possible eruption.

The first case is Mt. Usu located in northern Japan erupted for the first time in 23 years in March 2000. This area is well known for the hot–springs. More than 1 million tourists per year visit there to enjoy the beauty of nature. However, Mt.Usu has erupted 7 times in its history and devastated villages around the mountain. After its last eruption in 1977, Japan Meteorological Agency (JMA), universities and other research institutes have continuously observed this volcano. They have been conducting research on volcanoes and monitoring on a real–time basis by using seismographs and cameras.

Therefore, they identified the increasing number of volcanic earthquakes was unusual. Meteorological Agency commented on the high possibility of imminent eruption. Immediately, the National Government dispatched officials

to the site and set up a local headquarters. Local governments issued an “Evacuation Advisory” to residents and tourists. The Evacuation Advisory” was raised to an “Evacuation Order” which is the highest-level of warning. Approximately 16,000 residents and all tourists have completely evacuated within one day.

Then eruption occurred, which was only a half-day after evacuation was completed. 5 craters were formed by the eruption and volcanic ash rose to height of 3,200m above the crater. It was a large-scale volcanic eruption that brought huge economic loss to the hot-spring resort, however, no one was killed or injured.

The second case is Miyake Island. In late June of 2000, a large number of earthquakes began on Miyake Island located 100 kilometers south of the capital Tokyo, alerting the islanders of possible eruption. In early July, an eruption took place at the top of Mt. Oyama on the island. The mountain erupted repeatedly and toxic volcanic gas like sulfur dioxide was emitted. Since September, all residents of the island evacuated the island by ship. There were no deaths or injuries recorded, although related earthquakes killed one person on another island, even though houses and roads, electricity, water supply and other infrastructure were totally damaged, seriously affecting the inhabitant’s livelihoods.

The absence of human casualties in both cases can be attributed to the coordinated efforts taken by the people in various sectors. Firstly, it can be largely attributed to the accurate prediction made by a continuous observation with latest technology. The accurate prediction made it possible to establish first response system quickly by national government and related organizations. Secondly, the strong network among all relevant ministries and organizations enabled effective decisions on the most efficient mode of transportation for evacuation and to set up shelters immediately. Moreover, partnerships with other organizations such as the media contributed a lot to disseminating information such as “Evacuation Order” to all residents.

In Mt.Usu, now the volcanic activity is over and the local governments and

universities are planning to establish an eco-museum so that people can learn the science and technology relating to the active volcano and disaster management. Their aim is not only to avoid damage by early warning but also to enjoy the beauty of nature as resources for tourism. We call this policy “Living with Volcanoes”.

On the other hand, on Miyake Island, the mountain has released sulfur dioxide and other toxic volcanic gases constantly. Even today, it continues to release 10,000 to 20,000 tons of gases a day, an output level unprecedented anywhere in the world and is not expected to end in the near future. For this reason, the island's population of nearly 3,000 is unable to return to the island to this day after almost 2 years. The reconstruction projects are ongoing by the Government so that residents can return to the island smoothly when toxic gas releases cease.

Since Japan has high-density population and there are many volcanoes on the island as I told you before, we need to live with volcanoes and enjoy their blessing while avoiding disasters which could be caused by their activities. As the first report on disaster reduction initiatives issued by ISDR says “The earthly powers are not just a fact of life, but one side of the coin of a good life. It depends on the ability of humankind to cope and to live with risk.”