

State of river water pollution derived from the recent volcanic activity of Mt Iwo-Yama, Kirishima volcanoes

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Mt Iwo-Yama belonging to the Kirishima Volcanoes erupted in 2018 for the first time in 250 years. The recent activity of the volcano has a profound effect on the regional economy, especially in the fields of agriculture and tourism. With the phreatic eruption in April 2018, muddy thermal water spouted out from the newly opened vents resulting pollution in the downstream river. As a result, about 1,400 farmers in the downstream area abandoned rice cultivation in 2018.

The muddy water from the newly opened vents is strongly acidic and high in the concentrations of chloride and sulfate with a remarkable amount of arsenic and some kinds of heavy metals. The mud from the vents is mainly composed of grayish argillaceous particles and elemental sulfur suggesting that it is originated from highly-altered zone related to the geothermal reservoir beneath the volcano.

The vents are still busy gushing the muddy thermal water and vapor/steam as of mid-February 2019, ten months after the eruptive events. Based on our continuous investigation, the overflowing water from the vents is constantly strongly acidic ($\text{pH} < 1$) and contains a relatively high concentration of arsenic, although the overflow rate is not constant and changes on occasion. The results of our latest chemical analysis show the water contains around 5 mg/L arsenic. Besides, the spring water in the west flank area of the volcano, which is one of the headwaters of the local river, has become strongly acidic with a rise of volcanic activity. That spring water is also one of the reasons for water pollution in the downstream. As a result, even recently the river water pollution in the foot of the volcano is sometimes reported. The river water pollution thus remains as a problem to be solved both environmentally and economically.

Keywords: Iwo-Yama, Kirishima Volcanoes, Ebino Highland, river water pollution, arsenic