

Temporal change in sediment discharge from the fine ash-covered slope of Miyakejima Volcano (3)

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The Miyakejima Volcano has been covered by thick volcanic ash deposits since its last eruption in 2000. The ash cover impedes infiltration of rainwater and causes frequent occurrences of debris flows. It is well known that such an ash cover increases sediment discharge by debris flows in general and also empirically known that the increased sediment discharge decreases year by year. Miyakejima Volcano is also thought to follow the same course. However, it is difficult to predict the future sediment discharge quantitatively because the mechanism of the temporal decrease has not been clarified yet. Consequently, the authors are executing the research activity to clarify the mechanism. In this paper, we reported that the present state of the sediment discharge at Miyakejima Volcano in the third year after the 2000 eruption.

The authors continued runoff measurement at the same six sites in the source area of the Kaniga-sawa River (former called as Sanshichisawa gully) and the Tatsune-sawa River (formerly called as Tatsune gully). One site was added to the source area of the Enoki-sawa River located in the western part of Miyakejima Volcano. The data obtained from 2002 to 2003 in the source areas show that runoff ratio is totally different from each other, depending on its vegetative damage and thickness and grain size distribution of the volcanic ash. Mean runoff ratio exceeds 40% at the sites where the ash is fine-grained, deposited thicker than 15cm, and vegetation has been thoroughly damaged. On the other hand, a mean runoff ratio is smaller than 10% at the sites where vegetation recovers or the grain size of the volcanic ash is very coarse. These data show that not only thickness of volcanic ash deposits but also vegetation damage and grain size distribution seem to affect water discharge from the source area.

The observations of the flow at the mouths of the three rivers show that flush floods appear succeedingly after a heavy rainfall and seemed to be strong enough to erode and change river morphology. In most of the rivers, however, down cutting has almost ceased because the gully erosion met lava underlying widely in the volcano edifices. On the other hand, active erosion still continues at some rivers such as Tatsune-sawa River, dissecting the abandoned scoria deposits. There was seen a very significant change in a valley. In those rivers, sediment discharge would continue as far as flush flood keeps in occurring in the upper reach.