Geophysical Research Abstracts, Vol. 8, 03348, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03348

Development of the prediction method of the sediment yield in the volcanically disturbed watersheds

T. Yamakoshi (1), S. Tagata (1), J. Kurihara (1) and Y. Doi (2)
(1) Public Works Research Institute(yamak226@pwri.go.jp), (2) C.S.J. Co.Ltd.

Once a volcano erupts, pyroclastic material falls onto watersheds near-by, which results in disturbing hydrologic and erosional condition. In many cases, it results in the extraordinary amount of sediment yield from unexpected torrents. Thus, the post-eruption sediment discharge poses serious risks to communities around volcanoes. To mitigate the risk, it is critical to reduce the ĄgunexpectednessĄh. The authors have conducted various surveys at a recently erupted volcano in order to develop the prediction method of the sediment yield in the volcanically disturbed watersheds. In this report, the interim results of the surveys are presented as follows. 1) Hydrological surveys at the hillslopes with the different thickness of the pyroclastic materials clarify that Hortonian overland flow is the dominant runoff process, which shows the clear positive relationship between the thickness of the deposits and its runoff ratio. It implies that the more the pyroclastic materials deposit, the more likely sediment would be yielded. 2) The repeated aerial surveys, aerial photos and LiDAR, reveal that deep gullies began to form immediately after the eruption. Most of them have penetrated through the new pyroclastic deposit layer and touched the massive ancient lava flows underlain. It is quantitatively clarified that the total amount of the eroded sediment composed not of the new pyroclastic materials, but mainly of the original soil. As a result obtained, at a post-eruption volcano, the new deposition of the pyroclastic materials triggers the erosion. In order to know the potential of the severe erosion, it is necessary to know the distribution of the deposited materials immediately after an eruption. On the other hand, the potential volume of sediment yield is not decided only by the distribution of the new deposits. It is greatly subject to the characteristics of the shallow geologic setting. For the better preparedness, it is valuable to investigate it before an eruption.