



The study about sediment runoff of the Kawamada Dam catchment

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Abstract

The sediment runoff in the catchment depends on history of sediment production, sediment volume and size distribution along the river, and magnitude of rainfall. In particular, the volume of sediment runoff is not so large in the river section where the armoring processes develops, while it is large where the sediment production just occurs. It indicates that sediment runoff can vary considerably, depending on the condition of the sediment in the basin, even with roughly the same intensity of rainfall. In order to explain this kind of phenomena, the authors conduct the numerical simulation of the sediment runoff. For this purpose, the authors apply the Rainfall Runoff Inundation and Sediment transport (RRIS) model, which was developed by Yorozuya *et al.* (2017).

Kawamata catchment experiences an inflow of about 500 m³/s frequently, while the largest inflow of 1,344 m³/s during the 1981 flood, which causes the debris flows. Because of the debris flow, large amounts of sediment are produced in the catchment. In 1983, when the annual maximum inflow of 286×10^3 m³/s is recorded, the annual sedimentation reaches 497×10^3 m³. Thereafter, when similar inflows are experienced, the annual sedimentation volumes are not particularly large. It indicates that sediment runoff can vary considerably, depending on the condition of the sediment in the basin, even with roughly the same intensity of rainfall.

Figure 1 shows temporal changes in sedimentation from RRIS modeling with applying exactly the same three rainfall patterns, which correspond to the sediment discharges. As the figure shows, the sedimentation decreased each time as a rainfall event of the same magnitude was repeated.

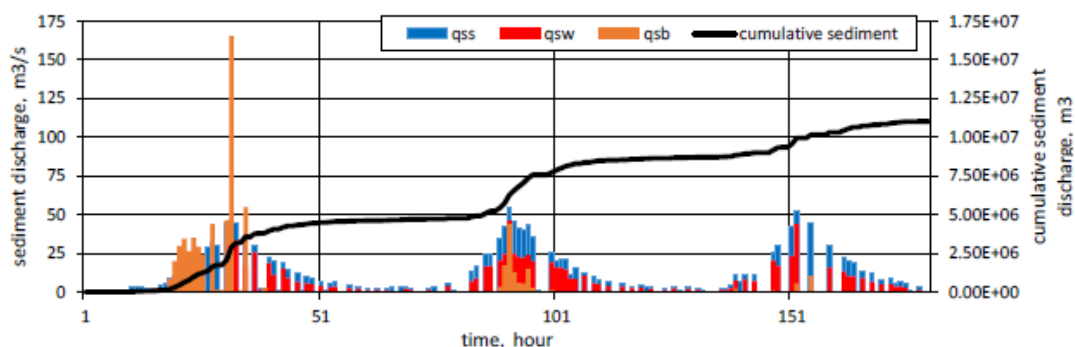


Figure 1: Calculated sediment discharge

Keywords: Rainfall Runoff Inundation Sediment transport model, sediment transportation in drainage basins, sedimentation in dams

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