

The application of hydrograph analysis to recognize various discharge components during rainstorms : a case study in Central Java, Indonesia

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Abstrak

In a small tropical watershed (Sanggreman River Basin) being representative for a great part of the Serayu Valley (Central Java, Indonesia), the hydrological behavior during rainstorms was studied by means of hydrograph analysis. With regard to the water discharge as a reaction to rainfall the Sanggreman catchment behaves as four subsystems, i.e., (i) delayed flow ($K=0,980$), (ii) quick flow originating from rain falling directly upon the water surface of the river and upon the saturated surface zone near the river, (iii) quick flow originating from rain falling upon the area where sandstone or tuffaceous conglomerates from the underlying hardrock, and (iv) quick flow originating from rain falling upon the area where marls or claystone are exposed sometimes covered by a shallow soil. Peak stages, and thus peak discharges, can be regarded as a function of the amount of rainfall falling during one storm and the river stage before the rainstorm activates the stage rise, the latter representing a measure of the water storage in the catchment.