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Ecology and Development Series No. 18, 2004

**Surface runoff and infiltration processes in the Volta Basin, West Africa:  
Observation and Modeling**

The study presents the analyses of field observations and simulation experiments with an event-based, two-dimensional hydrodynamic model. The model summarizes the interactions between temporally dynamic rainfall, infiltration process and surface runoff in a catchment with varied soil physio-hydraulic properties, surface-roughness, slope-lengths and vegetation structure. Both observation and simulation results indicate that, the observation scale affects runoff coefficient and runoff discharge per unit area. The effect of scale is the result of spatial variability in infiltration opportunities, which vary with the slope length and distribution of saturated conductivity, leading to different transmission losses potential during runoff routing downslope. The magnitude of the difference is influenced by surface and vegetated microtopography; which determine the flow rate.