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## Where Are the Rainwaters?

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### Abstract

Despite the very high annual rainfall total in some tropical African countries, hunger due to the insufficient food production is still the order of the day. This provoked the question bothering on what is happening to the high quantity of rainwater that comes from the often heavy rainfall.

An attempt to answer this question among others stimulates a field study of the surface runoff process and estimation in the Volta Basin, West Africa, which is one of the largest river basins in the tropics. Some runoff plots are constructed in one of the basins catchment called Kotokosu near Ejura, a major food production base in the transition zone of Ghana. The plots were constructed in a scaled dimension of 2 m×2 m, 2 m×6 m, 2 m×18 m, to also study the effect of scales on the runoff process. The catchment total runoff was monitored from a weir constructed at the outlet river equipped with automated depth recording instrument. Vegetation characteristic, soil physio-chemical properties were actively monitored and all other weather parameter were monitored in the rainfall season of the year 2002.

Results indicate that a very substantial part of the rains are lost in the surface runoff process due to poor soil infiltration properties, poor farming practice and untapped rainwater harvesting potential. These results were also used to validate a rainfall partition model that adequately divides the each rainfall events into, infiltration, deep percolation and surface storage, evapotranspiration and surface runoff depending on the soil slope, surface roughness, hydraulic conductivity, vegetation characteristics among others. The study concludes with suggested field management strategies that will improve efficient utilization of the abundant natural resources and enhance sustainable food production in the tropics.

**Keywords:** Rainfall, surface runoff, sustainable food production