Title of Article: Rainfall-Runoff Relationships and Flow Forecasting, Ogun River, Nigeria

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Abstract: An excess or a lack of rainfall are the major causes of most hydrological hazards, and the need for a systematic approach to river flow forecasting based on rainfall is imperative, especially in Nigeria. A study was carried out on three major gauging stations of the Ogun river basin to determine the rainfall-discharge relationship and model equations for use in the basin and similar basins. Stream flow and rainfall data for at least seven consecutive years for each station were collected and analyzed. The rainfall-runoff data were subjected to linear, exponential and higher order analysis. Stream flow data were also fitted to normal, log-normal and log-Pearson Type III distributions. The selection of the appropriate probability distribution model for each gauging station was based on graphical comparisons between observed and predicted flows and goodness-of-fit tests using chi-square and probability correlation coefficients. Results show that model equations with logarithmic and exponential relationships between rainfall and discharge gave better and more realistic prediction estimates and can be used for the basin. It was determined that the peak discharges occurred when the rainfall values were at their maximum, and a distinct relationship between the discharge and rainfall exists at each of the gauging stations.