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Hydrological Characterization of a Watershed for Streamflow Prediction

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Abstract : In this paper, we extend the versatility and usefulness of GIS as a methodology for any river basin hydrologic characteristics analysis (HCA). The Gurara River basin located in North-Central Nigeria is presented in this study. It is an on-going research using spatial Digital Elevation Model (DEM) and Arc-Hydro tools to take inventory of the basin characteristics in order to predict water abstraction quantification on streamflow regime. One of the main concerns of hydrological modelling is the quantification of runoff from rainstorm events. In practice, the soil conservation service curve (SCS) method and the Conventional procedure called rational technique are still generally used these traditional hydrological lumped models convert statistical properties of rainfall in river basin to observed runoff and hydrograph. However, the models give little or no information about spatially dispersed information on rainfall and basin physical characteristics. Therefore, this paper synthesizes morphometric parameters in generating runoff. The expected results of the basin characteristics such as size, area, shape, slope of the watershed and stream distribution network analysis could be useful in estimating streamflow discharge. Water resources managers and irrigation farmers could utilize the tool for determining net return from available scarce water resources, where past data records are sparse for the aspect of land and climate.

Keywords : hydrological characteristic, stream flow, runoff discharge, land and climate
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