

## **Assessing the impact of land use/land cover and climate changes on water stress in the derived savanna**

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**Abstract** Understanding the impact of land use/land cover (LULC) and climate patterns on basin runoff is necessary in assessing basin water stress. This assessment requires long-term observed rainfall time series and LULC spatial data. In order to assess the potential water stress, the study used long-term (1981–2007) rainfall data to drive the Pitman monthly rainfall–runoff model to assess changes in runoff for three selected basins in Nigeria: Asa, Ogun and Owena. In spite of the limitations in the availability of spatio-temporal hydro-meteorological data, the model results revealed commensurate increase in the runoff coefficient with decreases in forest cover between 1981 and 2000. Low runoff coefficients of 5.3%, 12.0% and 6.4% were recorded for Asa, Ogun and Owena basins, respectively, based on C-CAM projection of low rainfall for 2010–2050. These results indicated that in the future, water stress in Asa and Owena basins would be much higher, when compared with Ogun basin.

**Key words** land-use/land-cover; climate change; rainfall; runoff; hydrological modelling; water stress; derived savanna; Nigeria