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Surface water potential of the river Osun at Apoje sub-basin Nigeria

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In order to archive the millennium goals of which water for all by the year 2015 is a major component; all efforts must be made to efficiently utilise the available water resources in various parts of the world and more importantly in Africa which has been described as the worst hit. In Nigeria, water scarcity in terms of quality and quantity is a major problem. In order to assess the potential of the River Osun at Apoje sub-basin located in the southwestern part of Nigeria, the streamflow and gauge height data of 18 years (1982–1999) were collected from Ogun-Osun River Basin and Rural Development Authourity, Abeokuta, Nigeria. A rating curve was drawn for the station by plotting the gauge heights against their annual maximum discharges. The annual cumulative inflows for each year were determined and plotted against water years to evaluate their spatial distributions. Mass curve was drawn for each year and their potential reservoir capacities were determined. The results show that, at the return periods of 10, 25, and 50 years, the upper flood limits of 430, 451, and 458 m^3/s, respectively, were obtained at 95% confidence intervals and the level of significance of 0.025. The coefficient of determination r^2 of 0.9984 shows a good fit of the rating curve. The annual cumulative inflow in the sub-basin varies from 60 to 306 billion m^3 of water in 18 years. The average annual cumulative inflow was 125 billion m^3 of water while the interannual variability was 42%. The intraanual variability was between 56 and 83%. The maximum potential reservoir capacity of 22 billion m^3 of water can be built in the area to cater adequately for diverse uses in the sub-basin.

Keywords:

streamflow; gauge heights; Apoje sub-basin

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