

# **Application of the Pitman and Smar Rainfall-Runoff Hydrological Models for Wami River Basin of Tanzania**

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The applicability of two lumped conceptual Rainfall-runoff models, the monthly time step Pitman and the daily time series Soil Moisture Accounting and Routing (SMAR) models have been tested in six selected sub-basins of Wami river basin of Tanzania. The Wami River Basin (40,000 km<sup>2</sup>), is an important area due to its diversified use which benefits a multi-diversity of stakeholders. The study is aimed to assess the applicability and suitability of the two conceptual models for the Rainfall-Runoff system in the Wami river basin in order to solve the discharge data availability problem in the study area. The input data to the models were average catchment rainfall and potential evaporation. Eight years record length data has been used from which the calibration and verification periods were 5.3 years (1/1/74 to 2/5/79) and 2.7 years (3/5/79 to 31/12/81) respectively. In the process of examining the applicability of the models, the simulated and observed flow sequences were compared and the results have been discussed by evaluating the goodness-of-fit in terms of Mean Annual Runoff (Mm<sup>3</sup>), Model efficiency (R<sup>2</sup>), and Comparative time series graphs. The attained calibration (R<sup>2</sup>) values vary in the Range of (51.38-77.37) and (45.94-79.89) for Pitman and SMAR model respectively. Fairly good Calibration results coupled with poor verification results have been obtained for most of the sub-catchments. As a conclusion to the study, the models inadequacy related to the complex nature of the basin and the input data problem has been discussed and recommendations are given for further studies.