Abstract

Sustainable water resources management requires reliable methods for quantification of hydrological variables. This is a big challenge in developing countries, due to the problem of inadequate data as a result of sparse gauge networks. Successive occurrence of both abundance and shortage of water can arise in a catchment within the same year, with deficit situations becoming an increasingly occurring phenomenon in Kenya. This work compares the performance of two models in the Tana River catchment in Kenya, in generation of synthetic flow data. One of the models is the simpler USGS Thornthwaite monthly water balance model that uses a monthly time step and has three parameters. In order to explore alternative modelling schemes, the more complex Pitman model with 19 parameters was also applied in the catchment. It is uncertain whether the complex model (Pitman) will do better than the simple model, because a model with a large number of parameters may do well in the current system but poorly in future. To check this we have used old data (1970-1985) to calibrate the models and to validate with recent data (after 1985) to see which model is robust over time. This study is relevant and useful to water resources managers in scenario analysis for water resources management, planning and development in African countries with similar climates and catchment conditions.