

Estimation of evapotranspiration in the Kihansi river catchment

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This study was aimed at quantifying the PET and AET in the Kihansi River catchment. The catchment area is about 80 km². Three meteorological stations with climatic data were used. They are Udzungwa (983506), Mapanda (983508) and Uhafiwa (983509). The methods used for the estimation of PET are modified pan evaporation, Penman combination, Penman for East Africa and Thomthwaite. In case of estimation of AET storage (water balance), Turc and Pike, Schreiber, Ol'Dekop and Morton complementary models were used. Mann-Kendall and linear regression methods were used to identify trend in the estimated annual evapotranspiration in the catchment it has been realised from the study that the mean monthly PET ranges from 50 mm to 176 mm. The annual mean AET ranges from 858mm to 1683mm, 686mm to 1188mm, 603mm to 1052mm and 744mm to 1268mm by storage, Turc and Pike, Schreiber and Ol'Dekop method respectively. The Morton complementary estimate of mean monthly and annual AET ranges from 15 mm to 143mm and 677 mm to 1051 mm respectively. Estimates of PET from Penman for East Africa and Thomth waite methods were highest and lowest respectively. Estimation of AET by Turc & Pike, Schreiber and Ol'Dekop methods had a good relationship when compared with computed storage method. The study realized that there is no significant trend in the estimated annual evapotranspiration values in the catchment. Penman combination and Morton complementary are the suitable models for the estimation of PET and AET respectively in the catchment when it is gauged. Turc and Pike model is suitable for estimation of evapotranspiration if the catchment is ungauged.