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COMPARISON, INTER RELATIONSHIP AND RECALIBRATION OF MODIFIED PENMAN METHOD WITH PENMAN-MONTEITH METHOD

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ABSTRACT

This study deals with the evaluation of monthly reference evapotranspiration (ET_0) estimation using FAO-24 Modified Penman (MP) method by comparing its performance with that of FAO-56 Penman-Monteith (PM) method, developing relationship between MP and PM methods and recalibrating the method with respect to PM method. Tirupati region of Andhra Pradesh, India is selected as the study area and its meteorological data was collected from the India Meteorological Department, Pune. During comparison, it is observed that the percentage deviations of ET_0 values estimated by MP method with reference to PM method are significant. Even after developing inter-relationships between PM and MP methods, the performance is not satisfactory. Therefore, it is recalibrated with respect to PM method. The recalibrated MP method yielded the least RMSE and high R^2 & EC values resulting in ET_0 comparable with that from PM method. The MP method performed well in terms of performance evaluation criteria. The slope and intercept respectively close to one and zero also indicate an improved performance of the method with recalibrated coefficients. Therefore, recalibrated MP method may be recommended for reasonable ET_0 estimation in the study area.

KEYWORDS: Modified Penman, Penman, Monteith, Recalibration, Reference Evapotranspiration