

## EVALUATION OF REFERENCE EVAPOTRANSPIRATION ESTIMATION METHODS IN NELLORE REGION

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### ABSTRACT

In the present study, nine empirical methods for calculating daily reference evapo transpiration ( $ET_0$ ) namely, Blaney-Criddle, Jensen-Haise and Hargreaves (temperature based), Priestley-Taylor, Radiation and Makkink (radiation based), Modified Penman (physically based), Pan Evaporation and Christiansen (pan evaporation based) methods have been evaluated with respect to FAO-56 Penman-Monteith (PM) method for estimating daily  $ET_0$  in the semi-arid Nellore region of Andhra Pradesh, India. Data was collected from the India Meteorological Department (IMD), Pune. The evaluation is based on performance criteria namely, Root Mean Square Error (RMSE), Coefficient of Determination ( $R^2$ ) and Efficiency Coefficient (EC). The relationships between PM method and the other methods were developed to obtain daily  $ET_0$  estimates comparable with PM method. The  $ET_0$  equations were then recalibrated with respect to PM method for improving their daily  $ET_0$  estimation capability in the region selected for the present study. The recalibrated Modified Penman and Blaney-Criddle methods showed satisfactory performance in the daily  $ET_0$  estimation. However, the recalibrated Blaney-Criddle method may be adopted because of its simpler data requirements with reasonable degree of accuracy.

**KEYWORDS:** Reference Evapotranspiration, Recalibration, Performance Evaluation