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A study has been carried out to compare the most commonly used empirical formulae for calculating reference crop evapotranspiration (ET_0) for a given set of climatic parameters.

Modified Penman method (MPM), Radiation, Blanny-Criddle, Hargreaves and Thornthwaite methods have been chosen for this study.

Daily values of weather parameters such as temperature, humidity, bright sunshine hours and wind speed were collected from the Gannoruwa weather station for the period of four years from 1993` to 1996. ET_0 has been compared. Each method on daily, weekly and monthly basis and results are compared. From this analysis it has been found that there is a close relationship between the Modified Penman method and the Radiation method. The correlation between these two methods can be given approximately by using the following 2nd order polynomial.

$$ET_{O\,(pen)} = 0.0275\,(ET_{O\,(RAD)})\,2 + 1.1794\,ET_{\,O(RAD)} + 0.3604$$

It has also been found that the other methods except the Radiation method do not show proper correlation with the MPM. But the analysis shows that the Hargreaves and the Blanny-Criddle methods provide results which are approximately close with those of MPM during the period from April to October in each year. This can be due to high temperature and bright sunshine hours prevailing during these months as compared with the rest of the year. Thornthwaite method always predicts very low values of ET_0 as compared with the MPM.

The most sensitive weather parameter on the Modified Penman formula is found to be the number of bright sunshine hours. The effects of weather parameters such as temperature wind speed and humidity are less compared to the bright sunshine hours.