

## **Effect of the meteorological variables on the evaporation amount at different temporal scales in Sistan Plain**

### **Abstract**

Evaporation is an important climate phenomenon that is associated with many other climate parameters. Correctly estimate the amount of evaporation plays an important role in water resources management and the crop water requirement. This study is consists of two parts. In the first part, the significance of five major factors, including solar radiation, vapour pressure deficit, relative humidity, wind speed and air temperature that control evaporation, were evaluated comparatively at daily, 10-day and monthly time-scales using the data from zabol, zahak in Sistan plain and nehbandan station. It was found that the role of controlling variables in evaporation varied with the time-scale. The vapour pressure deficit was best correlated with pan evaporation at all time-scales, while the relative humidity, was least correlated with pan evaporation. In the second part, eighteen equations for calculating evaporation, including seven methods by temperature-based methods, six methods by mass transfer methods and five methods by radiation-based methods, were compared with pan evaporation. The comparison was first made using the original constant values involved in each equation, and then using the recalibrated constant values. Results showed that when used as the primary constant, large differences exist for the equation at all three stations. When the original constant values were replaced by the calibration constant, equations were much improved. From this equations, Hamon and Linacre equation from temperature methods Dalton from mass transfer methods and Hargreaves and Jensen methods from radiation based methods for three stations more consistent with the values of the evaporation. Also observed the methods of temperature based methods than mass transfer and radiation based methods have more consistent with the amounts of pan evaporation. With properly determined constant values, the Hamon, Linacre and McGuinness and Bordne methods can be recommended for estimating evaporation in the study region.

**Key words:** evaporation, temporal scales, meteorological variables, pan evaporation



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