Impact of Weather Parameters on Some Models for Predicting Potential Evapotranspiration

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Abstract

Thornthwaite (THON), Blaney-Morin-Nigeria (BMN), Penman (PEN) and Penman-Monteith (PM) empirical formulae were used to predict Potential Evapotranspiration (PET) in two stations (Ibadan and Onne) located in the humid south of Nigeria. The responses of the selected models to changes in their climatic input parameters were examined. Five input parameters (temperature, solar radiation, wind speed, relative humidity, and radiation ratio) were varied to simulate climate change over the study area. The effects of this climate change were evaluated following the base line values of potential evaptranspiration computed for each of the locations. While the Thornthwaite method is mostly affected by temperature, the Blaney-Morin-Nigeria model is highly sensitive to solar radiation and relative humidity. The result showed that about 20°C increase in temperature caused more than 25% increase in PET by THON, 10% in PEN, 7% in PM and 5% in BMN. The study showed that the Blaney-Morin-Nigeria model gave the best result for the locations considered.