

Interactive comment on “Assessment of climate change impact on hydrological extremes in two source regions of the Nile River Basin” by M. T. Taye et al.

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Certainly trends in ETo merit further investigations given the reasons you pointed out. However, we are of the view that while the Penman Monteith (PM) is recommended for reasonable estimation of ETo, its thorough use is in some cases a challenge. It is not always sensible to use the PM with all the given variables because either not all variables (e.g., wind speed and radiation) are available or the climate models show large biases for the different variables. In our case, the latter was found to preclude its thorough use. Because we found it necessary to incorporate various models to account

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for a larger range of models, it was logical for us to assume the historical relationships to avoid eliminating those models without sufficient variables necessary for the PM equation. Additionally, some studies have found that using the PM in its complete form may lead to ETo values that are physically meaningless because of the climate model uncertainties involved in the ETo variables and recommend using historical coefficients instead of the complete PM equation (e.g., Ekström et al., 2007). To limit the influence of the biases, it is perhaps wise to use the empirical relationships determined from historical data.

The statement “in most cases ETo is decreasing as both wind speed and radiation have been decreasing on a global scale during the last decades” is debatable (eg. See Brutsaert and Parlange, 1998; Huntington, 2006). Researchers have found that it is the pan evaporation that decreases yet the ETo increases. However, these findings may depend on the region. In this regard, we will include a brief discussion of the observed ETo trends and the sensitivity of ETo to the different variables.

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