

## MODELLING EVAPORATION AND EVAPOTRANSPIRATION UNDER CLIMATE CHANGE IN MALAYSIA

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### Introduction

Climate change has a direct effect on hydrology through its link with evapotranspiration. This study assessed the potential impact of climate change on the evapotranspiration.

### Materials and Methods

Measured climatic data from the MUDA Irrigation Scheme were obtained from their computerised records. These were used in the various models to compute evaporation and evapotranspiration (Penman, 1948). Methods to estimate free-surface evaporation EP and potential evapotranspiration ET, without any model calibration parameters, for monthly time series are presented. (Fennessy and Kirshen, 1994) Model results are calculated without keeping any model calibration parameter by using observed average historic (1980-97) meteorological data (Monteith, 1965) and compared with USBR Class-A black pan evaporation data (1971-97) from the Muda Agricultural Development Authority, Malaysia. The long-term monthly averaged daily estimates of  $E_p$  for

different months were compared with measured pan evaporation.

### Results and Discussion

Results of this simulation showed that the long term daily estimates of  $E_p$  for different months simulate more than 95% with the observed pan evaporation data. The variations are slightly more from December to March. It is thought that the variation is due to lower rainfall during these months. In the study on the effect of climatic influence all model equations containing temperature terms were set dependent of temperature.  $ET_p$  time series is perturbed by varying monthly temperature rises from 21°C to 41°C with 0.2°C increment to investigate the sensitivity of that series (Milly, 1992). These showed that the temperature had significant effects on  $ET_p$  for each month with a value of  $R^2 = 0.9875$ .

### Conclusions

The model developed was able to estimate 95% of the measured pan evaporation. Results from the study showed that temperature had significant effects on monthly  $ET_p$ .

### References

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