The objective of this study is to investigate the capability, flexibility and versatility of the computer models currently used in irrigation work by the Royal Irrigation Department. The equations for evapotranspiration available in the models are emphasized in order to apply in the area with limited data. Then, the models are compared for appropriate application with the Nakhon Nayok Irrigation Operation and Maintenance Project.

About 7 equations for evapotranspiration are studied using climatic data. They are Hargreaves 1985, Penman-Monteith, Jensen-Haise, FAO-24 Pan Evaporation, Penman 1948, Penman A.M. Michael and Penman Doorenbos and Pruitt. The evapotranspiration for the rainy seasons of 1979-1980 are calculated using the climatic data measured at Suphan Buri Climatological Station and Samchuk Water Consumptive Used Station at Suphan Buri. They are compared with the measured values by Lysimeter in order to select the proper equation for the Nakhon Nayok Project. It is concluded that Penman Doorenbos and Pruitt should be selected and the climatic data measured at Prachinburi can represent the ones at Nakhon Nayok. For a preliminary study, 5 computer model are studied. WASAM, WATERCAL and CADSM are then selected for comparison in details. The irrigation water requirement of Nakhon Nayok Project during year 1995 are estimated and compared.It is concluded that all 3 models provide the total water requirement for a crop season approximately equal to the data. However, there are some differences in the distribution of monthly water requirement. In addition, the models are used to estimate the irrigation water requirement in 1972,1973 and 1993 which corresponded to 2, 5 and 10 year return period. It is concluded that all models provide similar results.

The model calibration and application indicate that WASAM is the most appropriate and relatively easier than others. Since WASAM is developed on WINDOWS with Thai Language Option, it can be easily calibrated or applied to other projects.

ภาควิชา   วิศวกรรมโยธา (แหล่งน้ำ)   ลายมือชื่อนิสิต...

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