

Soil-water and grass evapotranspiration experiments in Tribhuvan University micro-catchment soil

Binod Shakya¹ and Samridhi Shrestha²

¹Central Department of Hydrology and Meteorology, Tribhuvan University (CDHM,T.U)

²Central Department of Environmental Science, Tribhuvan University (CDES,T.U)

ABSTRACT:

Soil water flow, water retention and crop evapotranspiration is of fundamental importance to agronomist, soil scientist, environmentalist and hydrologist and are critical elements in assessing the environmental implications of soil and crop management. In recent times, the importance of the relationship between soil, water, climate and crop production is growing steadily with the increase in demands on food production and water resources. In this connection, various laboratory experiments are required for understanding soil-water movement and evapotranspiration. Experiments have been carried out from April to July 2004 to determine the grass evapotranspiration (ET_0) and soil hydraulic properties in the T.U Micro-catchment. Penman/Monteith model is used to check the experimental results on ET_0 . Several hourly meteorological data, such as temperature, humidity, wind speed, rainfall etc., have been considered to estimate the ET_0 from Penman/Monteith agro-climatic model. The results showed that the estimated and measured reference crop evapotranspiration are close to each other. The standard errors of estimation between ET_0 's for the months of June and July are 0.11 and 0.04 mm/day respectively. The bulk density of soil is 1.2 g/cm³ and water content (θ) is 0.47. The residual water content θ_r is around 0.068. From Darcy's experiment the saturated hydraulic conductivity is measured 6.0 mm/day.

Key words: reference crop water requirement (ET_0), pan evaporation (E), residual water content (θ_r).
