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A WATER BALANCE STUDY OF TAAL LAKE BASINS

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## ABSTRACT

A water balance study is a quantitative analysis over some period of time of all water gains, losses and storages for a particular place or area. In simpler context, it is a bookkeeping of volumes of water entering and leaving or being stored in an area or system during a period of time. This study attempted to determine the fractions of rainfall that are converted to streamflow, evapotranspiration, change in basin water storage, and groundwater recharge for Taal Lake Basins which has a total area of 3,942 square kilometer. The basin was divided into two catchments, Batangas and Cavite catchments as dictated by topography and for convenience. Assessment of the empirical formula that could best predict the potential evapotranspiration for the basin was also considered in this study. Three formulas namely: the Blaney-Criddle, Thornthwaite and the Penman formula were compared with the available pan evaporation data.

This study disclosed that the Penman formula was the most fitted method that can be used in the basin. For a long-term water balance computation, it was also found out that the average annual change in basin storage was negligible. The result of water balance computation



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conducted for the period 1972 to 1979 concluded that of the total annual rainfall, 48 percent was contributed to streamflow, 38 percent to evapotranspiration and 14 percent to groundwater recharge. It was also noted that the water balance computations yielded only an approximation of the amount of groundwater recharge. Deep well observations would provide a more appropriate method of determining the groundwater recharge. The average monthly and annual water balances were presented for two catchments, as well as for the whole basin.

Water balance equation based on the conservation of mass can be applied to any basin in the Philippines provided good data are available. It can be used to predict the fraction of rainfall that goes to the streamflow, transformed into evapotranspiration or goes down to groundwater as recharge for project planning and efficient water resources management.

Some recommendation were made for the improvement and development of the existing system of hydrological and climatological observations. Also, a follow-up study on water balance of basin with different soil cover were recommended. Effects of the change of agricultural land use to water balance was also suggested for future study.

