B-125: Water balance of a tank cascade system in the dry zone

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Minor tanks have been constructed as series along natural tributaries which collectively form tank cascades due to the drendatic pattern of drainage in the dry zone landscape. Utilization and management of these minor tanks cannot be considered individually due to their hydrological inter-relationships. In cascade level development and management planning it is important to estimate various hydrological parameters therefore, a study was planned to quantify them in a selected cascade through a water balance exercise.

The Siwalakulama tank cascade system belonging to Nachchaduwa major watershed in the Anuradhapura district was selected for the study. The cascade consists of 25 minor and micro tanks spreading over the watershed which has a land area of 3970 ha. The area was mapped for physical features, soil, landuse, topography and subwatershed boundaries. Rainfall, open pan evaporation, tank water storage, irrigation issues and the stream discharge, were monitored during the study period (Oct. 1996 to Oct 1997).

Results show that runoff/rainfall ratio on seasonal basis varies from 0.01 to 0.08 during Maha season and from 0.01 to 0.06 during Yala season in the study catchment. In addition to runoff, tanks benefit from direct fall of rains by about 25 - 30 % of annual total inflow. Tank water is lost to the atmosphere through evaporation and transpiration in a magnitude of 22-33% of the storage. Percolation from tank (including seepage from the tank bund) has varied in a wide range giving an average of 27 % of total outflow. In general, it was found that about 50 % of the volume stored annually in a tank move out by various means leaving the rest for irrigation.