

**Mean Year Seasonal Groundwater Balance for Upper Ganga Canal  
Command Area**

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**ABSTRACT**

The water balance studies were undertaken in the Upper Ganga Canal (UGC) command area to evaluate the various hydrological components, with an objective to verify the values obtained for such components during the calibration studies of the groundwater model exclusively developed for this region, under the WAPCOS consultancy project.

In view of the limited availability of data as well as the limitation of time, the scope of this study has been restricted to the seasonal water balance i.e. monsoon (June to October) and non-monsoon (November to May) for the mean year condition 1970-79 only. The study area has been divided into canal irrigated, well irrigated, unirrigated cropped areas and uncropped areas. Depending on the source of water supply, the water balance components of UGC area have been identified as rainwater balance, canal water balance and groundwater balance for all the computational purposes. The precipitation component for rainwater balance has been evaluated by isohyet method. The rainfall recharge component during the monsoon season is considered to be 15% as per CGWB recommendations. Based on the studies conducted between Raiwala and Narora, runoff is considered to be 50% of the rainfall and remaining part of rainfall is considered to be used for beneficial and non-beneficial consumptive uses. During the non-monsoon season, recharge and runoff, from rainfall are considered to be zero as the rainfall received during this period is very small.

The seasonal canal water balance has been computed on the basis of evaluation of conveyance losses of the distribution system and the field percolation loss has been calculated on the basis of existing irrigation practices and cropped area.

The groundwater balance has been calculated from the evaluation of the different recharge components (rainfall recharge, conveyance recharge, field percolation recharge) and abstraction components (extraction by wells based on observed data, evaporation from shallow water table area, and evapotranspiration by trees and other deep rooted crops based on the recommendations available in the literature).

Finally, using the observed pre-monsoon and post-monsoon water level contour maps, the change in ground water storage has been evaluated and compared with the results obtained from the water balance. The study indicated that the UGC system is in the state of dynamic equilibrium.

