



## **Reservoir and Land-Use Induced Changes in River Flow Dynamics in a Tropical River Basin in India**

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Assessment of stream flow dynamics reveals principal characteristics of a river basin as it results from a complex blend of hydrological drivers. Earlier studies suggest climatic parameters and land use changes are the major causes of river flow changes in the basin. However, introduction of large-scale irrigation and other irrigation management activities in the basin will also play a crucial role in stream flow variations. The present work aims to understand the contributions of these drivers towards decreasing river flows in the Malaprabha river basin, Karnataka, India. Results of the Mann-Kendall trend test showed non-significant decreasing trends in annual and seasonal rainfall patterns in the area. The effect of Land Use /Land Cover (LU/LC) change on stream flows was analyzed using decadal LU/LC maps for the period 1985,1995 and 2005 as inputs to the Soil Water Assessment Tool (SWAT) hydrological model. Further, the effect of Malaprabha reservoir on stream flows was analyzed by performing SWAT simulations for with and without reservoir conditions. The comparative analysis showed that there is negligible contribution of decadal LULC on river flows. However, the presence of the reservoir was found to be contributing 43% of stream flow variability. This study revealed that at catchment scale reservoir storage and related operational activities affects the river flows more significantly than LULC changes.