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Runoff Estimation Using NRCS-CN Method

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Abstract : The GIS and remote sensing techniques facilitate accurate estimation of surface runoff from watershed. In the present study an attempt has been made to evaluate the applicability of Natural Resources Service Curve Number method using GIS and Remote sensing technique in the upper Krishna basin (69,425 Sq.km). Landsat 7 (with resolution 30 m) satellite data for the year 2012 has been used for the preparation of land use land cover (LU/LC) map. The hydrologic soil group is mapped using GIS platform. The weighted curve numbers (CN) for all the 5 subcatchments calculated on the basis of LU/LC type and hydrologic soil class in the area by considering antecedent moisture condition. Monthly rainfall data was available for 58 raingauge stations. Overlay technique is adopted for generating weighted curve number. Results of the study show that land use changes determined from satellite images are useful in studying the runoff response of the basin. The results showed that there is no significant difference between observed and estimated runoff depths. For each subcatchment, statistically positive correlations were detected between observed and estimated runoff depth ($0.6<R^2<1$). Therefore, the study reveals that Remote Sensing and GIS based NRCS-CN model can be used effectively to estimate the runoff from the ungauged watersheds when adequate hydrological information is not available.

Keywords : curve number, GIS, remote sensing, runoff
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