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Estimation of Evapotranspiration using satellite data and hydrological model of Chenab catchment, North Western Himalaya

Avtar Singh Jasrotia (1,2), Kuljit Kour (2), and Ajay Kumar (2)

(1) Department of Geology,University of Jammu, India (asjasrotia@yahoo.co.uk), (2) Department of Remote Sensing and GIS ,University of Jammu, India

Evaporation takes place from the surfaces of ocean, lakes and also from soil moisture. Vegetation also produces water vapor in the form of transpiration. This combined vapor, known as Evapotranspiration (ET) gets stored in the atmosphere, moves up and forms clouds. In the present study estimation of evapotranspiration has been carried out by using different satellite data and Variable Infiltration Capacity (VIC) hydrological model, which all depends on accuracy of input data for simulation of soil water content and actual ET. Since in-situ observations represent only point local observations and remotely sensed data were used to estimate spatial distribution. Evapotranspiration has been estimated over a period of 2000 to 2015 first by using Moderate Resolution Imaging Spectroradiometer (MODIS) satellite data using SEBS approach and by combining it with hydrological model. In which MODIS products like Land Surface Temperature (LST), Leaf Area Index (LAI), Normalized Difference Vegetation Index (NDVI) and surface albedo were considered important inputs both for the SEBS approach and hydrological model. The results show the increasing trend in annual evapotranspiration w.e.f 2000-2015. However, the annual evapotranspiration average value is 154mm (2000-2015) derived by integrated satellite data and model derived components gave more accurate results as compared to the annual evapotranspiration derived from only satellite data average value 344.5mm.

Key words: Evapotranspiration, satellite data hydrological model Chenab catchment, North Western Himalaya