



Operationalization of snow and glacier melt Runoff Model to compute Hydropower Potential in Chenab basin, Himachal Pradesh, India

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Abstract: Himalayan region has high concentration of mountain glaciers and is also covered by seasonal snow during winter. Snow and glaciers-melt runoff is the important source of water for the Himalayan Rivers. Due to steep slopes, all such streams have potential for hydropower generation. The snowmelt runoff model, developed for Malana nala located at Parbati river, in Himachal Pradesh and validated at adjacent Tosh nala, has been used in this study to compute hydropower potential for 72 watersheds in Chenab basin, India. Watershed areas vary from 687 sq km to 20 sq km and the areal extent of glacier and permanent snow fields vary from 90.13 sq km to 0.46 sq km (watershed area 30 sq km). Input parameters like areal extent of snow cover were found out using IRS WiFS and AWiFS data. Glaciers and permanent snow fields were delineated using LISS III data of IRS. Altitude of snow line, glacier snout and available head were computed using Survey of India toposheets. Rain fall, snowfall, maximum minimum temperature data were used from Patsio automatic weather station at Bhaga sub-basin. Degree day method is used to compute runoff and hydropower potential for each watershed. It has been observed that maximum power potential is 194.606 mw in monsoon season at watershed no. 52D0501 and minimum power potential is 0.006 mw in winter season at watershed no. 52H0605.

Keyword: Glacier, Hydropower, Runoff, Snow