

**Rathore B.P., Kulkarni A.V. and Sherasia N.K., 2009, Understanding future changes in snow and glacier melt runoff due to global warming in Wangar Gad basin, India, Current Science, 97(7), pp 1077- 1081.**

**Abstract:**

Himalayas has one of the largest concentrations of glaciers and permanent snow fields. These are sensitive to climate change. Snow and glacier runoffs are important sources of water for the Himalayan rivers. Due to steep slopes, all these streams are potential sites for hydropower generation. To understand the power potential of small sub-basins, a snowmelt run-off model has been developed for Malana nala located in the Parbati river basin near Kullu in Himachal Pradesh and validated at the adjacent Tosh nala in the same basin. In the model, information generated through remote sensing techniques were used in conjunction with the daily maximum and minimum temperatures, rainfall and snow fall. This model is now extended to understand the effect of global warming in stream runoff and power generation. To understand changes in runoff and power potential, possible changes in the input parameters were estimated by considering 1°C rise in temperature from 2004 to 2040. Snow line is calculated for 2040 using present altitude and lapse rate. Future change in areal extent of glacier and permanent snow were estimated using mass balance, response time and rate of melting at terminus for all glaciers in the basin. The model was validated for all seasons in 2004 and for selected seasons from 1997 to 2002. The error in runoff estimate was observed between 2 and 5%, except for the summer of 2002. The model suggests overall reduction in stream runoff by 8–28%, depending on the season.