

Impact of Climate Change on the Snow Hydrology of Koshi River Basin

A. Khadka¹, L. P. Devkota², R. B. Kayastha³

¹ Nepal Development Research Institute, Shree durbar Tole, Pulchowk, Lalitpur, Nepal

² Nepal Development Research Institute, Shree durbar Tole, Pulchowk, Lalitpur, Nepal

³ Department of Environmental Science and Engineering, School of Science, Kathmandu University, Dhulikhel, Nepal

ABSTRACT

Koshi river basin which is one of the largest river basins of Nepal has its headwaters in the northern Himalayan region of the country covered with perennial snow and glaciers. Increased warming due to climate change is most likely to impact snowpack of this Himalayan region. Snowmelt Runoff Model, a degree day based method, was used in this study to assess the snowmelt hydrology of the five sub-basins, viz. Tamor, Arun, Dudhkoshi, Tamakoshi and Sunkoshi of the Koshi river basin, with and without climate change impacts. The model has been fairly able to simulate the flow. Daily bias-corrected RCM data of PRECIS-ECHAM05 and PRECIS-HadCM3 for the period of 2041-2060 were used for future projection. A period of 2000-2008 was set as baseline period to evaluate changes in future flow. In climate change scenarios, magnitude and frequency of peak flows are expected to increase and snowmelt contribution to total river flows are likely to be more. Simulated flow results indicate that the annual flow would still be governed by monsoon flow even in the future under the climate change impact. A high probability of having more flows and snowmelt in 50's decade than that in 40's decade is seen. The estimated future flow by ECHAM05 is found more than those estimated by HadCM3 both seasonally and annually.

Keywords: *Climate change, Snow hydrology, Degree day factor, Koshi Basin, SRM Modeling*
