

FREQUENCY ANALYSIS AND FLOOD FORECASTING USING RCM DATA IN HEC-HMS FROM DUDHKOSHI BASIN NEPAL

Dhurba Lochan ADHIKARI* and Tirtha R. ADHIKARI

Central Department of Hydrology and Meteorology, Tribhuvan University, Kirtipur, Kathmandu, Nepal

* Corresponding Author: dladhikari@gmail.com

ABSTRACT

Rivers from Nepal are poorly gauged specially in the high altitudinal area. In this study seven rainfall stations and one gauged Rabuwa and another ungauged Thotna Khola were taken to our hydrological modelling purpose in DudhKoshi River basin, Nepal. The observed and future projected Providing Regional Climates for Impact Studies (PRECIS) data were taken from DHM. Future precipitation bias corrected data were used to determine the characteristics of high flow events in the basin, in which snowmelt runoff was not taken into consideration. This research investigates the potential changes on discharge and flood events in future in DudhKoshi Basin. Long term hydrology, Flood frequency analysis were carried out. In case of ungauged basin where no historical data was available, regional flood frequency analysis is considered as a viable means to approximate at-site flood characteristics by exploiting the information available at neighboring sites. For this study, a lumped hydrological model developed in HEC-HMS 4.0 is implemented over the study area (3849 km²) for calibration and validation of the model. Calibrated parameter from Rabuwa station were used to determine the discharge of Thotne Khola. The result shows that HEC-HMS has the best fit among the methods used. The projected simulation depicts a slightly increasing trend of discharge for middle centuries (2030-2060). Hence, Hydrological modeling is a powerful technique in planning and development of integrated approach for management of water resources.

KEYWORDS: Frequency analysis, HEC-HMS, Flood, Bias correction