Evolving Water Resources Systems: Understanding, Predicting and Managing Water–Society Interactions
Proceedings of ICWRS2014, Bologna, Italy, June 2014 (IAHS Publ. 364, 2014, 9-13).

Climate change scenarios and its impact on water resources of Langtang Khola Basin, Nepal

TIRTHA RAJ ADHIKARI[1], LOCHAN PRASAD DEVKOTA[1] & ARUN BHAKTA SHRESTHA[2]

1 Central Department of Hydrology and Meteorology, Tribhuvan University, Kathmandu, Nepal
tirtha43@yahoo.com
2 International Centre for Integrated Mountain Development, Kathmandu, Nepal

Abstract General Circulation Models (GCMs) successfully simulate future climate variability and climate change on a global scale; however, poor spatial resolution constrains their application for impact studies at a regional or a local level. The dynamically downscaled precipitation and temperature data were used for the future climate scenarios prediction for the period 2000–2050s, under the Special Report on Emissions Scenarios (SRES) A2 and A1B scenarios. In addition, rating equation was developed from measured discharge and gauge (stage) height data. The generated precipitation and temperature data from downscale and rating equation was used to run the HBV-*Light 3.0* conceptual rainfall–runoff model for the calibration and validation of the model, gauge height was taken in the reference period (1988–2009). In the HBV-*Light 3.0*, a GAP optimization approach was used to calibrate the observed streamflow. From the precipitation scenarios with SRES A2 and A1B emissions at Kyanging, an increase of precipitation during summer and spring and a decrease during winter and autumn seasons was shown. The model projected annual precipitation for the 2050s of both the A2 and A1B scenarios are 716.4 mm and 703.6 mm, respectively. Such precipitation projections indicate the future increase of precipitation in all seasons except the summer. By the end of the 2050s simulation projects an increase maximum (minimum) discharge of 37.8 m^3/s (13.9 m^3/s) for A1B scenario and 36.2 m^3/s (14.3 m^3/s) for A2 scenario. A maximum projected discharge will increase for all seasons except for spring, whereas the minimum will decrease in summer.

Key words water resources; Nepal; climate change