

Impacts of Climatic Changes on Hydrology of the Narayani Basin: Distributed TOP Model-Based Assessment

Ram Gopal Kharbuja^{1,2} and Keshav Prasad Sharma³

² *Department of Electricity Development, Kathmandu*

³ *Department of Hydrology and Meteorology, Kathmandu*

ABSTRACT

Blockwise use of TOP model with Muskingum-Cunge method (BTOPMC) was used to simulate daily flows for different climate change scenarios. The scenarios comprised of temperature increment of 0 °C to 3 °C and rainfall increment of 0% to 50%. The impacts of climate change on hydrology of the basin were assessed in reference to the observed temperature and rainfall. Long-term mean and maximum flows were found to be increased with increase in either temperature or rainfall while minimum flows were found to be reduced with increase in temperature. The monthly analysis of the simulated flows with increase in temperature revealed that the stream flows decreased in dry season (February to June) while it increased in other seasons. The increases in deficits and surpluses were not in linear with increase in temperature. These impacts are likely to be of concern to water managers to assure access to fresh water in dry seasons and to safeguard lives and properties from increased floods in wet seasons.

Key words: Climate Change, Hydrology, Distributed Modeling, Narayani basin, BTOPMC
