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Rainfall and river discharge variability in Bagmati river catchment of Nepal

Impacts of climate change on precipitation and water availability are found to vary depending on geographic location and other characteristics of the region. Variabilities in rainfall and river discharge of a Himalayan mountainous catchment of the Bagmati river in Nepal were examined based on historical gauge records of 1970-2015. Daily rainfall series from 12 stations and river discharge from Karmaiya/Pandheradovan station were used in this study. Prior to creating annual series, both datasets were homogenized. Non-parametric Mann-Kendall test was employed to identify trends in annual rainfall and discharge series. The analysis showed that annual rainfall in the region and river discharge from the catchment is decreasing, however the changes are statistically insignificant (at the 95% confidence level). An evaluation of five-yearly rainfall departure from mean revealed that fluctuation of rainfall during 1975-2000 corresponds to the long-term mean value of the study period. In contrast, the catchment had remarkably varying rainfall in all three of the five-yearly periods after 2000. Further, it had substantially low rainfall during 2005-2015. Results also confirmed that river discharge of the catchment is directly associated with rainfall, even though the magnitude of difference between the two become more pronounced in certain periods. The study indicated that variability of rainfall in the region is increasing and availability of freshwater may become scarce in response to climate change.

Biography

Dinesh Tuladhar is pursuing his PhD at Curtin University, Western Australia. He has completed his Master's degree in Geography from Tribhuvan University (2006) and Master's degree in Geospatial Information Sciences (GIS) from Curtin University (2009). He has over 10 years of experience in GIS, remote sensing, data analysis and research. His PhD research includes case study of river flow variability and influencing factors in two Himalayan mountain catchments in Nepal with contrasting geographical characteristics.

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