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Uncertainties in impact assessment of climate change on rainfall extremes in the lake Victoria Basin

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It was investigated three sources of uncertainty in climate change impact analysis on rainfall extremes; those due to inter-global climate models (GCMs) differences, statistical modeling, and choice of the downscaling method. The analysis was based on 9 selected rainfall stations in the Lake Victoria basin in Eastern Africa. There were 14 GCMs for each station and each GCM had 20 daily control simulations and a total of 53 daily future projection series for each of the periods 2050s and 2090s. A number of criteria were used for the inter-comparison and evaluation of these GCM simulations. Three statistical downscaling methods based on quantile change factors, with and without addition/removal of wet days were considered. Confidence intervals on estimated return periods were constructed by employing Jackknife and Monte Carlo methods in a combined way. It was found that GCMs' performances were not consistent for all the considered criteria. Results of climate change impacts on the rainfall extremes obtained from the downscaling methods considered were different. The statistical uncertainty on the 10-year rainfall intensity quantile of the study area as a data scarce region showed the need for its consideration in decision making for water engineering applications. The three studied sources of uncertainty are vital for water resources managers beside the discernable impact of the climate change on rainfall extremes.

Biography

Onyutha Charles is a PhD student under the supervision of Patrick Willems who is a professor of water engineering at KU Leuven and Vrije Universiteit Leuven. He is undertaking research on temporal variability of floods and its driving forces. He has published 3 papers in internationally peer-reviewed journals.

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