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Analyses of Precipitation and Evapotranspiration Changes across the Lake Kyoga Basin in East Africa

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Abstract

This study analyzed changes in CenTrends gridded precipitation (1961–2015) and Potential Evapotranspiration (PET; 1961–2008) across the Lake Kyoga Basin (LKB). PET was computed from gridded temperature of the Princeton Global Forcings. Correlation between precipitation or PET and climate indices was analyzed. PET in the Eastern LKB exhibited an increase ($p > 0.05$). March–April–May precipitation decreased ($p > 0.05$) in most parts of the LKB. However, September–October–November (SON) precipitation generally exhibited a positive trend. Rates of increase in the SON precipitation were higher in the Eastern part where Mt. Elgon is located than at other locations. Record shows that Bududa district at the foot of Mt. Elgon experienced a total of 8, 5, and 6 landslides over the periods 1818–1959, 1960–2009, and 2010–2019, respectively. It is highly probable that these landslides have recently become more frequent than in the past due to the increasing precipitation. The largest amounts of variance in annual precipitation (38.9%) and PET (41.2%) were found to be explained by the Indian Ocean Dipole. These were followed by precipitation (17.9%) and PET (21.9%) variance explained by the Atlantic multidecadal oscillation, and North Atlantic oscillation, respectively. These findings are vital for predictive adaptation to the impacts of climate variability on water resources. [View Full-Text](#)

Keywords: precipitation variability; potential evapotranspiration; climate indices; trend analyses; climate variability; Lake Kyoga Basin; Bududa landslides; Hargreaves method

