

FLOOD FREQUENCY ANALYSIS IN LAKE VICTORIA BASIN BASED ON TAIL BEHAVIOUR OF DISTRIBUTIONS

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ABSTRACT

The primary objective of the study was to find a suitable distribution class for flood frequency analysis on the Kenyan side of Lake Victoria basin. This involved performing at-site analysis using Peak Over Threshold (POT), analyzing the shape of the distribution's tail using quantile-quantile plots, selecting appropriate distributions for modeling flood peaks, fitting extreme value distributions and determining the return periods for various flood extremes.

Results from extreme value analysis on quantile-quantile plots showed that seven out of the eleven river gauging stations used in the analysis had their discharge values falling under normal tail distribution class, and only four stations had their discharge values falling under heavy tail distribution class. Extreme Value type 1 (EV1/Gumbel) distribution proved to be the best fit for all the cases of the normal tail behaviour. For the case of heavy tail distribution class, General Extreme Value (GEV) was the best distribution. These distributions were used to estimate the return periods for various flood extremes which could be used as measure of safety (the 'inverse risk').

Key words: *flood frequency analysis, probability distributions, tail behaviour, quantile-quantile plots, Peak Over Threshold (POT).*

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