Urban flash flood and extreme rainfall events trend analysis in Bamako, Mali

This study investigated the temporal trends in flash flood and extreme rainfall events in Bamako, Mali for the period 1982–2019. Satellite CHIRPS data as well the observation data were used for this study. Five rainfall extreme indices established by ETCCDI were analyzed to characterize extreme rainfall intensity and frequency indices. The Gumbel extreme value distribution was used to estimate the return period of flood and extreme rainfall for the period of 5 to 100 years based on the annual maximum daily rainfall. All the five extreme rainfall indices displayed an upward trend except the consecutive wet days that showed a decreasing trend. Both the intensity and frequency of extreme rainfall were found to have increased over the study period. Analysis of the flood reports showed an increasing trend in Bamako from 1982 to 2019. 58% of flood were caused by normal rainfall while 33,3% by extreme rainfall. The findings from this study have demonstrated that floods in Mali are prevalent and adaptation and mitigation strategies are needed.

Key word: Flood, Bamako, Rainfall, Extreme rainfall indices.