

Flood Forecasting Using Quantitative Precipitation Forecasts and Hydrological Model in Sebeya Catchment, Rwanda

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Abstract

We used Satellite data, quantitative precipitation forecasts and rainfall-runoff model for short term flood forecasting in Sebeya catchment. The Global Precipitation Measurement (GPM) product was used as satellite rainfall product for model calibration and validation and forecasted European Centre Medium Range Weather Forecasts (ECMWF) rainfall products were evaluated for flood forecasting. The performance of the model was assessed using visual inspection of simulated and observed hydrographs and a set of performance indicators. Real time flow forecast assessment was conducted with respect to three different flood warning threshold levels for 3 to 24 hours lead times. The forecast skill was assessed and the result for 3 hours lead time showed that 144 hours out of 199 hours were hit hours and there were only 15 hours of false alarms and 19 hours of missed forecast. The number of hits decreased as the lead time increased. The accuracy of both the operational and real-time satellite rainfall products was too poor to serve as model inputs without bias correction. The flood forecasts have limitations in reproducing flood magnitudes. The findings of this study can provide a base for future studies to establish a flood early warning system in the study area and beyond.

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