Abstract

The paucity of reliable ground based datasets remains a major challenge over Kenya. In the advent of extreme wetness or drought events, reliable precipitation estimates for local characterization is a long overdue process. In the present study, four Satellite derived Precipitation Estimates (SPE): TMPA V7 3B42, PERSIANN-CDR, CHIRPS, and ARC2, are assessed over four homogeneous zones in Kenya with gauge based data during 1998–2016. Results show that variations of SPE products are based on complex geomorphology of different climatic zones. All SPE products depict bimodal annual precipitation pattern with west-east gradient representing heavier to lighter precipitation events. The Monthly analysis reveal good statistical agreement with reference datasets despite underestimation of precipitation in most regions. Seasonal precipitation events show that the PERSIANN-CDR perform better along low altitude humid climate and western zones around Lake Basin while ARC2 has uniform performance as gauge stations over highlands regions. Strong positive linear relationship on annual scale is evident in most SPE products with CHIRPS, ARC2, and TMPA exhibiting relatively high correlation (r) and minimum root mean square error (RMSE), except for PERSIANN-CDR. Overall, the findings of this study show the potentials of SPE products for applications over study domain. The TMPA V7 and PERSIANN-CDR could be useful in understanding individual floods events. Since the CHIRPS perform relatively well over ASAL regions, it could be utilized in monitoring droughts events.