Comparison of the Cameroon Weather Synoptic Stations Rainfall Data with TRMM Datasets: Intra and inter annual Rainfall variability.

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Abstract

Climatic hazards, associated with heavy precipitations and droughts greatly impact on the modification of socio-economic planning and livelihoods in the world, especially in developing countries where populations are highly vulnerable. With shifting seasons, increasing water scarcity, and potentially more frequent and intense extreme events, climate change is bringing a series of disaster and livelihood impacts to the poorest and most vulnerable countries and communities, and is placing development assistance at risk. Over the past decades, progressively more attention has been given to
converging Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA). The Cameroon (2N-14N and 9E-16E) Government is actually developing a wide program for DDR and CCA and needs regional climate modelling assistance. For instance climate modelling, to be consistent, requires deep validation using observational data.
Generally, models results are validated based on direct comparison with rain gauge data or reanalysis data over the region of interest, but the spatial repartition of synoptic weather stations in Cameroon is sparse and heterogeneous as the meteorological observation network is seriously deteriorating. Furthermore, the number of stations has decreased from
1300 stations in 1968-1980 to least than 250 stations at the beginning of the year 1991. The aim of this study is to evaluate how accuracy are the 3B43 TRMM data by a direct comparison with the available National Meteorological Department (NMD) data and to show whether synoptic weather stations data (rain gauge) could be replaced by these datasets in Cameroon for models validation. Annual rainfall distribution showed that TRMM 3B43 is slightly underestimated in the Sahel, Savannah and Highlands zones whereas it is overestimated in the mono-modal and bi-modal forest zones. Bias is generally most pronounced in the bi-modal forest zone. In general, the study showed that 3B43 closely matches rain gauge data, suggesting that the goal of the algorithm was largely achieved and therefore can be used as reference data for validating forecast simulations as a replacement of gauge

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data. We also noticed the rainfall inter and intra annual variability which can be assigned to motion waves. For instance, the best agreements with rain gauge data are obtained for the Cameroon northern zone rather than for its southern counterpart leading to two majors climatic regions in Cameroon: the North region with the rainy season in JJA and the South region with the rainy season ranging from May to November.