



Future Climate Modelling for the Volta Basin, West Africa, Wet or Dry?

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Over the last decade, a number of climatic models have conflicting predictions over the sign of the variation for the continent of Africa and especially at large regional scales such as for West Africa. Although individual models may disagree on the signs, but there is a consensus on the increase of the frequency of extreme events for the future (Hewitson, and Crane (2006), IPCC-AR4 (2005)). In this study, temporal characteristics of downscaled climate models adopted for the Volta basin, a semi-arid region in West Africa, are investigated in order to assess the impacts on for water resources based on the projections of the selected regional climate models (RCMs) REMO and MM5. For this purpose, the past, present and future rainfall outputs of the RCMs are analysed against gauged rainfall of 1961-2000 for exceedance probabilities, correlation and trends. A drought frequency is developed using the Standardized Precipitation Index (SPI) time series between 2006 and 2050 for the northern part of the Volta Basin. Using this analysis the drying trend for the future of 2006-2050 shows an increase of more than double in the occurrence of extreme to severely extreme dry events as a projection of the future compared to the same time space of 1961-2005. With the assertion that integrating the interaction with vegetation cover and albedo considerably improves the simulation of rainfall over the Sahel, the projections of REMO are regarded by this study as more plausible compared to MM5 whose projection were not based on present IPCC scenario projections.

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