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Dynamical Outlines of the Rainfall Variability and the ITCZ Role over the West Sahel

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Author(s)

Paulo Sérgio Lucio, Luiz Carlos Baldicero Molion, Cati de Avila Valadao, Fábio Cunha Conde, Andrea Malheiro Ramos, Maria Luciene Dias de Melo

ABSTRACT

This article evaluated the plausible causes of floods and droughts, the relative roles of large-scale climate variability in regional environmental trends, and the prospects for the future of the semiarid Sahel region in the context of periodic climate change. It is pointed out that the most significant rainfall climatological changes in the Sahel probably occurred between 1950 and 1980 with the decrease of the annual rainfall, a very high deficit (about 70%) over the whole region. The last three decades considered in this research (1981-2010) showed some improvement. The more humid conditions were from the last decade 2001 to 2010. One of the most significant climatic variations has been the persistent rainfall decline in the Sahel since late 1960s. Remarkable latitudinal shift of ITF mean position towards the South generated an overall reduction of annual rainfall. Basically, in this manuscript one analyzes the dynamical features on rainfall time series and the association of the cyclic periods with teleconnections under the hypothesis that no alteration has occurred. The results supply a reliable base to develop a methodology for medium to long-term seasonal forecast.

KEYWORDS

Climate Variability; Trend Analysis; Empirical SPI; BEST Index; PDO Index

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