

Abstract Book

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Analysis of the vegetation trends using low resolution remote sensing data in the Sahel (1982-1999) for the monitoring of desertification

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ABSTRACT

After about two decades of dramatic rainfall deficits that started in the late 1960s [1], the Sahel of West Africa has experienced increasing precipitation since the early 1990s [2-3]. Some authors suggested that the Sahel has been greening from the early 1980s to the late 1990s [4-5], but this article challenges these results.

The implementation of the United Nations Convention to Combat Desertification (UNCCD) [6] needs the identification of areas that record declining productivity of the vegetation productivity over long-time periods.

In this scope, we analyse the state of the vegetation productivity using long-term time series of NOAA AVHRR NDVI data and compare it to rainfall data. This method has been utilized by many others [7-11]. For this, 280 rain gauge data (RR) distributed from isohyets 100 to 700 mm in five countries of West Africa (Mauritania, Senegal, Mali, Burkina Faso and Niger) are analysed. Obtained values are then compared with the integrated NDVI (iNDVI) during the growing period (June to October) from 1982 to 1999.

Overall, more than 90% of RR data and about 80% of iNDVI data recorded positive trends over the 1982-1999 period. A majority of the studied stations in the Sahel were stable for the iNDVI/RR (60%). However, 35% showed a weak to strong negative trend in the iNDVI/RR while only 5% showed a weak positive trend. These negative trends recorded at about 1/3 of the analysed stations may reflect ongoing desertification processes in the Sahel and could be a starting point for the identification of hot-spots areas to determine where to take action within the National Action Programmes (NAP) or Sub-Regional Action Programmes (SRAP) to combat desertification.

Keywords: Low resolution remote sensing; NDVI; Rainfall; Trend analysis; Desertification, Sahel.

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