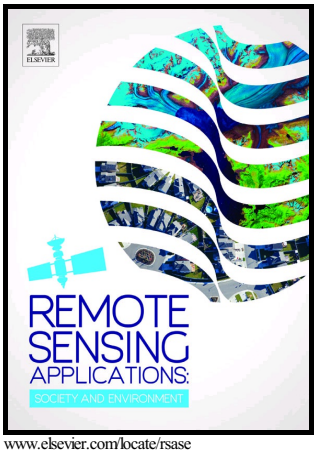
Sensitivity of Vegetation to Annual Rainfall Variations over Nigeria

Modupe Areola, Mayowa Fasona



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PII: S2352-9385(17)30073-3
DOI: https://doi.org/10.1016/j.rsase.2018.03.006
Reference: RSASE123

To appear in: *Remote Sensing Applications: Society and Environment*

Received date: 29 March 2017
Revised date: 22 October 2017
Accepted date: 14 March 2018

Cite this article as: Modupe Areola and Mayowa Fasona, Sensitivity of Vegetation to Annual Rainfall Variations over Nigeria, *Remote Sensing Applications: Society and Environment,* https://doi.org/10.1016/j.rsase.2018.03.006

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Modupe Areola*, Mayowa Fasona

Department of Geography, University of Lagos, Nigeria

*Correspondence: arefunmi@yahoo.com

ABSTRACT

Distribution and composition of vegetation are strongly controlled by climatic conditions. Of the climatic elements, precipitation has been found to be a major influence on the abundance, health and productivity of vegetation. This study investigated the spatial and temporal pattern in the sensitivity of vegetation to rainfall in Nigeria between 1980 and 2009. Rainfall data collected from 23 observation points were analysed and spatially correlated with monthly Normalized Difference Vegetation Index (NDVI) values for the same period to estimate the responsiveness of vegetation to annual variations in rainfall. The results revealed a non-uniform pattern in the sensitivity of vegetation to rainfall across the country. Areas in the forest and guinea savannah zones with higher mean annual rainfall exhibited stronger correlation, while the Sudan savannah zone exhibited weaker correlations. However, further northwards in the Sahel fringes, the correlations between rainfall and vegetation were found to be very negligible (mostly zero), except for the forested wetland around the Lake Chad where stronger positive coefficient of correlation were found. The findings have implications for ecological studies, agricultural planning and other socio-economic activities, which are directly concerned with vegetation and vegetal cover. This knowledge could be put to use to ensure better planning and decisions that concern the environment.

Keywords: NDVI, vegetation, precipitation, variations, spatial correlation