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Remote Sensing in Crop Monitoring Across North African Regions: An Assessment from Benin's Agricultural Perspective

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Abstract

Remote sensing technology has been increasingly adopted in crop monitoring across various agricultural regions worldwide. In North Africa, remote sensing applications are not as extensively documented compared to other continents. This article focuses on evaluating the utility of remote sensing for crop monitoring specifically from a Beninian perspective. This study reviews existing literature on remote sensing applications in crop monitoring within the context of North Africa, focusing specifically on Benin. Methodological approaches will be evaluated based on their technical feasibility, accuracy, and relevance to agricultural practices. A key finding is that while some remote sensing techniques have shown promise for identifying early signs of crop stress or disease across different regions, their utility in Benin's specific agro-ecological conditions remains underexplored. There is a notable lack of empirical data comparing traditional methods with remote sensing. While remote sensing holds potential for enhancing crop monitoring and management in North Africa, particularly in terms of early detection of stress or disease, its adoption requires tailored approaches that account for local environmental and agricultural conditions. Future research should focus on developing localized models to better understand the effectiveness of remote sensing in Benin's diverse agro-ecological settings. Additionally, integrating remote sensing data with traditional monitoring methods could provide a more comprehensive approach to crop management. Remote Sensing, Crop Monitoring, North Africa, Benin, Agricultural Practices The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, GIS, Landsat, Sentinel-2, MODIS, precision agriculture, vegetation indices*