



Remote Sensing in Crop Monitoring Across North Africa: An Historical Perspective on Egypt

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Abstract

Remote sensing technologies have been increasingly utilised for crop monitoring across North Africa, with Egypt serving as a significant case study due to its diverse agricultural landscape and climate conditions. The methodology involves a comprehensive literature review encompassing peer-reviewed articles, conference proceedings, and grey literature published between and . Quantitative data on the effectiveness of remote sensing in crop monitoring were not available for analysis. A thematic analysis revealed that satellite imagery combined with ground-based sensors provided a robust framework for monitoring crop health and yield across different geographical regions in Egypt, contributing to more efficient agricultural management strategies. Remote sensing technologies have significantly enhanced the accuracy of crop monitoring in Egypt, offering valuable insights into climate-resilient agriculture practices. However, challenges persist regarding data quality, cost, and spatial resolution limitations. Future research should focus on developing standardised protocols for remote sensing data collection and interpretation to ensure consistent results across different regions within Egypt. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Remote sensing, GIS, Crop modelling, Satellite imagery, Precision agriculture, Geostatistics*

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