



REVIEWER'S REPORT

Manuscript No.: IJAR-56126

Title: Variabilité intra-saisonnière des paramètres agroclimatiques dans le Bassin Arachidier du Sénégal de 1950 à 2022

Recommendation:

Accept after minor revision.....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality			✓	
Clarity	✓			
Significance		✓		

Reviewer Name: Faheem Abdul Muneeb

Reviewer's Comment

This manuscript provides a comprehensive spatio-temporal analysis of the intra-seasonal variability of key agroclimatic parameters in the Groundnut Basin of Senegal over a long historical period (1950–2022). Using daily rainfall data from multiple meteorological stations and posts, the study examines variations in the onset and cessation of the rainy season, seasonal rainfall totals, length of the rainy season, number of rainy days, and maximum dry spells. The research addresses a highly relevant issue for Sahelian agriculture, food security, and climate adaptation, particularly given the region's strong dependence on rain-fed farming systems. The manuscript is timely and policy-relevant, offering valuable insights into how climatic instability has reshaped agricultural seasons since the Sahelian droughts of the late 1960s and 1970s.

Scientific Contribution and Empirical Strength

The principal strength of the manuscript lies in its robust empirical foundation and long-term data coverage. The use of more than seven decades of daily rainfall records allows for a nuanced assessment of both spatial gradients and temporal trends across the Groundnut Basin. The results clearly demonstrate pronounced North–South contrasts, with earlier onsets, later cessations, longer rainy seasons, and higher rainfall totals in the southern zones, while the northern areas experience shorter seasons, fewer rainy

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days, and longer dry spells. The identification of significant rupture points (notably in 1967 and 1998) using the Pettitt test strengthens the analytical rigor and situates the findings within broader regional climatic transitions observed in West Africa. The quantitative results—supported by detailed maps, figures, and statistical tests—convincingly substantiate the authors' conclusions regarding increasing intra-seasonal irregularity and its implications for agricultural production.

Methodology and Analytical Approach

The methodological framework is appropriate and well articulated. The criteria used to define the onset and end of the rainy season, based on established agro-meteorological standards and implemented through INSTAT+, are scientifically sound. The combination of spatial interpolation (kriging), interannual trend analysis, rupture detection, and statistical comparison of sub-period means using Student's t-test provides a coherent and rigorous analytical structure. The use of multiple software tools (INSTAT+, RStudio, ArcGIS, Excel) is clearly justified and effectively integrated. Minor clarification regarding data quality control procedures and the treatment of missing data in long historical series would enhance methodological transparency, but these issues remain limited in scope.

Structure, Style, and Presentation

The manuscript is well organized, following a logical progression from study context and methodology to detailed presentation of results, discussion, and conclusion. The figures and maps are informative and effectively illustrate spatial and temporal patterns of agroclimatic variability. However, the paper is relatively long, and some sections—particularly within the results and discussion—contain descriptive repetition of similar trends across variables. Moderate condensation and greater synthesis would improve readability and strengthen analytical focus. Minor language and formatting revisions are also recommended to address typographical inconsistencies and improve overall clarity. These are primarily editorial issues and do not affect the scientific validity of the study.

Final Recommendation

This manuscript offers a rigorous, data-rich, and regionally significant contribution to the understanding of intra-seasonal agroclimatic variability in the Senegalese Groundnut Basin. Its findings have clear implications for agricultural planning, climate risk management, and adaptation strategies in Sahelian environments. With **minor revisions** focusing on condensation, editorial refinement, and limited methodological clarification, the manuscript will be well suited for publication.

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Decision: Accepted with minor revisions.