|  |
| --- |
|  |
| Journal Name: | [**Asian Journal of Physical and Chemical Sciences**](https://journalajopacs.com/index.php/AJOPACS) |
| Manuscript Number: | **Ms\_AJOPACS\_133733** |
| Title of the Manuscript:  | **MARKOV CHAIN ANALYSIS OF YEARLY PRECIPITATION AMOUNT OVER THE SOUTH-SOUTH REGION IN NIGERIA** |
| Type of the Article |  |

|  |
| --- |
| PART 1: Comments |
|  | Reviewer’s comment**Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | Author’s Feedback ***(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*** |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | **This manuscript is important in the case of Nigeria for it gives more insight in precipitation pattern.**  |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **Yes**  |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | **The abstract contains some grammatical errors that need attention. Here’s a refined version of the abstract:****Aims:** Markov chain analysis was employed to examine the pattern and distribution of yearly precipitation amount in Akwa Ibom, Bayelsa, Rivers, Cross River, Edo, and Delta states in Nigeria. **Duration of Study**: Twenty-one (21) years of data (1990-2020) on daily precipitation amount were obtained from the National Aeronautic and Space Administration (NASA) meteorological center.**Method:** The outcome of the standardized anomalies was used to rank yearly precipitation amounts into different Markov chain states for ease of analysis. A seven-state (*1: Wet, 2: Moderately wet, 3: Slightly wet, 4: Near normal, 5: Slightly dry, 6: Moderately dry, and 7: Dry).***Results:** A Markov chain was used to describe the behavior of precipitation occurrences in the study locations. Findings revealed that Rivers State had the highest amount of precipitation in 2007, while Edo had the lowest amount in 1999 over the study period. The standardized anomalies show a major positive departure in Rivers compared to other regions in the South-South. There is a 48%, 33%, 38%, 33%, 35%, and 38% chance of precipitation amount being normal (*state 4*) on any given year, regardless of previous weather conditions in Akwa Ibom, Bayelsa, Edo, Rivers, Cross River, and Delta, respectively.**Conclusion:** Understanding the transition from one Markov chain state of precipitation amount to another state is necessary for future planning in areas like agriculture, hydrological studies, and the entire planning of the South-South region. |  |
| Is the manuscript scientifically, correct? Please write here. | Yes |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.** | The references are sufficient.  |  |
| Is the language/English quality of the article suitable for scholarly communications? | There are a lot of grammatical errors in the manuscript that need attention.  |  |
| Optional/General **comments** | 1. **The conclusion of the manuscript needs to be refined. Here’s a refined conclusion for the author(s):**

This research has revealed that precipitation amount varies yearly across study locations in the South-South region of Nigeria. Findings from this work show a major positive departure in Rivers state compared to other South-South states, indicating extreme precipitation amounts yearly. The transition probabilities of precipitation in any state transiting into state 1 (wet) are very low across study locations. The seven-state Markov chain observed in this study depicts that even though the South-South region experiences heavy rainfall almost throughout the year because of its location in the rainforest, the region still experiences dry spells. Proper applications of the results from this work would help organizations, farmers, and the government in future planning and policy formulations because it influences agricultural activities and other aspects of human lives.1. The Introduction of this study and the interpretation of the results need grammar refinement.
 |  |

|  |
| --- |
| **PART 2:**  |
|  | **Reviewer’s comment** | **Author’s comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Are there ethical issues in this manuscript?**  | *(If yes, Kindly please write down the ethical issues here in details)* |  |

**Reviewer details:**

**Christogonus Ifeanyichukwu Ugoh, Nnamdi Azikiwe University, Nigeria**