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REVIEWER'S REPORT

Manuscript No.: IJAR-52017 Date:2-06-25

Title: Rainfall Prediction using Machine learning

Recommendation:
Accept as it is .....
Accept after minor revision.....yes.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

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

Reviewer Name:Dr.Shaweta Sachdeva **Date:** 2/06/2025

Reviewer's Comment for Publication. Accepted with some minor revision to polish the manuscript for IJAR

(*To be published with the manuscript in the journal*)

The reviewer is requested to provide a brief comment (3-4 lines) highlighting the significance, strengths, or key insights of the manuscript. This comment will be Displayed in the journal publication alongside with the reviewers name.

Significance

1. The paper shifts from traditional statistical methods to **machine learning (ML)**, addressing the limitations in handling nonlinear and noisy meteorological data.
2. Accurate rainfall forecasting is critical for agriculture, disaster management, urban planning, and climate resilience. This study aligns with growing needs driven by climate variability.
3. Practical use of MATLAB toolboxes showcases applied research with real-world utility, beneficial for both academic and industry practitioners.

Strengths

1. The manuscript outlines a full ML pipeline—from data collection and preprocessing to training, validation, and evaluation—ensuring reproducibility.

2.By comparing **decision tree** and **linear regression**, the study demonstrates the strengths and limitations of each, highlighting the importance of model selection.

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Key Insights

1. Decision Trees Capture Nonlinear Patterns: For most rainfall values, tree-based models outperform linear regression by capturing complex relationships.
2. Preprocessing Impacts Performance: Feature selection, normalization, and handling missing data significantly enhance model accuracy.

Detailed Reviewer's Report

1. Ensure section headings (e.g., *3.3 Machine Learning Models*) are consistently styled.
2. Improve transitions between paragraphs for smoother flow, especially in the Literature Study and Results sections.
3. Clearly differentiate which models were actually implemented (e.g., linear regression and decision tree) versus which were only discussed (e.g., SVM, ANN).
4. Quantify model performance with precise metrics (e.g., give actual MAE, RMSE, R^2 values for each model).
5. Expand on data sources: specify the dataset size, time range, and geographical scope.
6. Clarify the unusual data split ratio mentioned as "0.08 training and 0.02 testing" – likely a typo meant to be "80/20".
7. Ensure all figures have properly formatted captions and are referred to explicitly in the text.
8. Improve clarity in comparisons—for example, Figures 2–4 appear contradictory in evaluating which model performed better.
9. Ensure all in-text citations match the references and use consistent formatting (remove brackets around numbers, e.g., "[2,8]" → "[2,8]").
10. Add more recent references if available, especially for ensemble and deep learning methods.