Review of: "Flood Prediction Using Artificial Neural Networks: A Case Study in Temerloh, Pahang"

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Potential competing interests: No potential competing interests to declare.

While the research on flood prediction and management in Temerloh, Pahang, offers significant contributions, it's important to acknowledge certain limitations:

1. A thorough proofreading of the document is suggested.
2. The effectiveness of the flood prediction model heavily relies on the quality and availability of data. Despite utilizing datasets from the National Hydrological Network Management System (SPRHiN) and Weather Underground, there may be limitations in the completeness, accuracy, and temporal resolution of the data. Missing or incomplete data could affect the performance and reliability of the predictive model.
3. The findings and predictive model developed in this research may be specific to the Temerloh region and may not be directly applicable to other regions with different geographic, climatic, and hydrological characteristics. Generalizing the results to other areas without proper validation and calibration could lead to inaccurate predictions.
4. While artificial neural networks (ANNs) are powerful tools for predictive modeling, they can be complex and computationally intensive. The complexity of the model may make it difficult to interpret the underlying relationships between input variables and flood occurrence. Additionally, overfitting could occur if the model is trained on limited data without proper regularization techniques.
5. The study focuses on specific hydrological and meteorological factors such as rainfall, water level, streamflow, and temperature. However, there may be other relevant variables or factors (e.g., land use, soil type, topography) that were not included in the analysis but could significantly influence flood occurrence. Neglecting these variables could lead to an incomplete understanding and prediction of floods.
6. Like any predictive model, the flood prediction model developed in this research is based on certain assumptions and simplifications. There may be inherent uncertainties associated with the modeling process, including variability in environmental conditions, model parameterization, and future climate projections. Communicating these uncertainties and assumptions transparently is essential for interpreting and using the model results effectively.
7. Implementing and maintaining a flood monitoring dashboard, as proposed in the research, may face practical challenges such as data integration, system compatibility, and user accessibility. Ensuring the usability, reliability, and sustainability of the dashboard requires ongoing technical support, resource allocation, and stakeholder engagement.
8. The overall organization of the paper is not presented in the introduction section.
9. The study may have a limited temporal scope, focusing on a specific time period for data collection and analysis. Changes in environmental conditions, land use, or infrastructure over longer time scales could influence flood dynamics

but may not be adequately captured within the study period. Long-term trends and seasonal variations in flood occurrence may also need to be considered for a more comprehensive understanding.

10. While accuracy metrics such as accuracy, area under the ROC curve (AUC), mean squared error (MSE), and root-mean-squared error (RMSE) suggest a well-performing model, it's essential to validate the model's performance using independent datasets or through cross-validation techniques. Lack of robust validation could overestimate the model's predictive capabilities and lead to unreliable flood forecasts.

11. The accuracy and reliability of the flood prediction model heavily rely on the quality and preprocessing of input data. Issues such as outliers, measurement errors, or inconsistencies in the data may introduce biases and uncertainties into the model, affecting its performance. Robust data preprocessing techniques and quality control measures are essential to mitigate these issues.

12. While artificial neural networks (ANNs) offer high predictive accuracy, they often lack interpretability, making it challenging to understand the underlying relationships between input variables and flood occurrence. Interpretable machine learning models or post-hoc interpretability techniques may be needed to gain insights into the model's decision-making process and identify the most influential factors driving flood predictions.

13. The implementation of flood prediction models and monitoring dashboards may require significant computational resources, technical expertise, and financial investment. Limited resources, especially in developing regions, could hinder the widespread adoption and sustainability of such systems, limiting their effectiveness in real-world flood management scenarios.

14. Effective flood management requires active participation and engagement from local communities, government agencies, and other stakeholders. However, the research may not adequately address the socio-economic, cultural, and institutional factors that influence community resilience and preparedness for floods. Incorporating participatory approaches and stakeholder consultations could enhance the relevance and uptake of flood management strategies.