**Literature Review**

The author has identified that using long-short-term memory (LSTM) networks, the authors demonstrate superior performance in predicting rainfall with high accuracy and address the challenges of nonlinear data (Sankaranarayanan & Krishnan, 2020, ). The integration of artificial intelligence allows for effective flood management by enabling early warnings, precise resource allocation, and improved water management. The author in explores the application of machine learning (ML) algorithms for flood forecasting in Malaysia's Dungun River Basin, revealing an increasing frequency of flooding linked to rainfall patterns and intensities (Babar et al., 2022, ). The research demonstrates that artificial neural networks (ANN) achieved the highest prediction accuracy at 90.85%, outperforming other models like Random Forest (75.61%) and Logistic Regression (48.78%). By analyzing rainfall and water level data, the study highlights that most flooding events occur at rainfall levels between 1 and 500 mm, with a peak frequency of 110 events at 250 mm of rainfall. The study highlights in [1] that India faces severe flood risks, with temperature and rainfall intensity being critical parameters for early flood prediction, yet underutilized in existing models. A Deep Neural Network (DNN) model demonstrated the highest accuracy (91.18%) compared to machine learning algorithms like SVM, KNN, and Naïve Bayes, emphasizing its capability in flood forecasting. The research showcases the importance of leveraging seasonal data for early predictions, allowing preemptive measures to mitigate flood impacts on human lives and infrastructure. Some of the main challenges for rainfall prediction arise from the nonlinearities in weather data. Normally, temperature, humidity, wind speed, and cloud formation interact to influence rainfalls through relationships that cannot always be straightforwardly modeled with conventional methods. Findings reveal that the DNN approach effectively reduces prediction errors, making it a valuable tool for disaster management and early warning systems in flood-prone regions. Deep learning approaches, notably Long Short-Term Memory (LSTM) networks, attempt to accomplish exactly that. In these findings underscore the importance of ML models, particularly ANN and Random Forest, for enhancing flood forecasting accuracy and supporting proactive risk management strategies (Hadi et al., 2024, ).