

## Ideation Phase

### Define the Problem Statements

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Date	01 February 2026
Team ID	LTVIP2026TMIDS74755
Project Name	Rising waters: A Machine Learning Approach To Flood Prediction
Maximum Marks	4 Marks

#### **Abstract:**

Floods are one of the most destructive natural disasters that cause severe damage to human life, agriculture, infrastructure, and the economy. Due to increasing climate change and irregular weather patterns, predicting floods accurately has become a challenging task. Traditional methods often fail to provide timely and accurate flood warnings.

This project proposes a machine learning-based Flood Prediction System using classification algorithms such as Decision Tree, Random Forest, K-Nearest Neighbors (KNN), and XGBoost. The system analyzes important environmental and climatic parameters such as Temperature, Humidity, Cloud Cover, Seasonal Rainfall Data (Jan–Feb, Mar–May, Jun–Sep, Oct–Dec), Annual Rainfall, Average June rainfall, and Subdivision data to predict the possibility of flood occurrence.

Among the implemented models, XGBoost achieved the highest accuracy and was selected as the final model. The trained model is integrated with a Flask web application to provide a user-friendly interface for real-time flood prediction.

#### **Customer Problem Statement:**

Communities living in flood-prone areas face severe risks every year due to unexpected floods. Lack of accurate and timely prediction results in heavy damage to crops, houses, roads, and even loss of lives.

Authorities and disaster management teams require a reliable system that can predict floods in advance using historical environmental data. An accurate flood prediction tool can help in early evacuation planning, resource management, and minimizing economic losses.

Heavy rainfall combined with environmental factors increases flood risk. Therefore, a predictive system is required to analyze these factors and provide early warning alerts.

I am	Government authorities, disaster management teams, and people living in flood-prone areas who are directly affected by unexpected floods.
I'm trying to	<ul style="list-style-type: none"> <li>Analyze historical climatic data such as temperature, humidity, cloud cover, and seasonal rainfall.</li> <li>Predict whether there is a chance of flood occurrence in a specific region.</li> </ul>
But	<ul style="list-style-type: none"> <li>Inaccurate predictions may lead to unnecessary panic or lack of preparation.</li> <li>Delay in prediction may result in heavy loss of life and property.</li> </ul>
Because	<ul style="list-style-type: none"> <li>Sudden climatic changes and irregular rainfall patterns affect prediction accuracy.</li> <li>Improper data collection and incomplete environmental parameters reduce model performance.</li> </ul>
Which makes me feel	The reliability and trust in the prediction system may reduce if results are not accurate and timely.
What solution to solve the issue	Machine Learning algorithms can be used to analyze historical environmental data and identify patterns that lead to floods. By training classification models such as XGBoost on relevant features like temperature, humidity, and rainfall distribution, the system can accurately predict flood occurrence and assist in early warning and disaster management.