

Project Design Phase
Proposed Solution Template

Date	8 February 2026
Team ID	LTVIP2026TMIDS90283
Project Name	rising waters: a machine learning approach to flood prediction

1. Problem Statement (Problem to be solved)

Floods are one of the most destructive natural disasters that cause major damage to human life, agriculture, infrastructure, and the economy. In many regions, flood prediction systems are either not accurate, not automated, or not easily accessible to common users. Traditional forecasting methods rely heavily on historical data and manual analysis, which leads to delayed warnings and poor disaster preparedness. There is a need for an intelligent and automated system that can analyze environmental parameters and predict flood occurrence in advance.

2. Idea / Solution Description

The proposed solution is a Machine Learning-based Flood Prediction System that predicts the possibility of severe floods using environmental and rainfall data. The system uses supervised learning algorithms such as Decision Tree, Random Forest, KNN, and XGBoost. After training and evaluating the models, the best-performing model is selected and deployed using a Flask web application.

Users can enter parameters such as cloud cover and rainfall data through a web interface, and the system instantly predicts whether there is a possibility of severe flood or not.

3. Novelty / Uniqueness

The uniqueness of this project lies in integrating machine learning with a simple and user-friendly web application for flood prediction. Instead of relying on traditional manual analysis, this system provides instant and automated predictions. The solution transforms raw environmental data into actionable insights using advanced ML algorithms, making flood forecasting more accessible and efficient.

4. Social Impact / Customer Satisfaction

This solution can significantly help disaster management authorities and communities in flood-prone areas. Early prediction enables preventive measures, reduces property damage, and saves human lives. The user-friendly interface ensures that even non-technical users can easily access and use the system. By improving preparedness and response, the system contributes positively to society.

5. Business Model (Revenue Model)

The system can be offered as a subscription-based service to government agencies, disaster management departments, and environmental monitoring organizations. It can also be integrated into weather forecasting platforms or provided as a Software-as-a-Service (SaaS) model. Future enhancements such as real-time API integration can create additional revenue opportunities.

6. Scalability of the Solution

The solution is highly scalable as it can be deployed on cloud platforms and integrated with real-time weather data APIs. It can be extended to cover multiple geographic regions and adapted for different environmental conditions. With a larger dataset and continuous model training, the prediction accuracy can further improve, making it suitable for large-scale implementation.