

Flood Risk Prediction for House Construction Sites Using AI/ML

Project Title:

AI-Based Flood Level & Location Risk Prediction System for Kerala

Problem Statement:

Kerala faces frequent floods, especially during monsoon seasons. People who plan to build houses often do not have proper data on whether their chosen land/area is flood-prone. Currently, the decision is based only on local opinions or past incidents, which is not always accurate.

Proposed Solution:

We propose developing an **AI/ML-based system** that predicts:

1. **Future flood water levels** (3–6 hours ahead) using rainfall, humidity, dam discharge, and historical river data.
2. **Flood risk score for a specific location** (High / Medium / Low) to help new house builders assess land safety.

This will help citizens and local authorities make **data-driven decisions** on construction and disaster preparedness.

Features to Implement:

1. Flood Level Prediction Model

- Inputs: rainfall, humidity, temperature, dam release, past river water levels
- Methods: Linear Regression / Random Forest / LSTM (if needed)
- Output: "Predicted Water Level after 3 hours: 5.8 m (High Risk)"

2. Flood Risk Classification for Locations

- Inputs:
 - Elevation (from open data)
 - Past flood records of that area
 - River distance

- Rainfall intensity

- Output: Flood-prone probability (High / Medium / Low)

3. **Simple Web App / UI** (Optional but impressive)

- User enters location (pincode or latitude/longitude)
- System shows flood risk level
- System shows predicted water level from the ML model

Why This Project Is Relevant for Kerala?

- Kerala has had major floods in **2018, 2019, 2021**
- Many districts (Kottayam, Pathanamthitta, Idukki, Alappuzha) remain vulnerable
- A system like this can help homeowners and local planners

IEEE Reference (Required by College):

“Flood Prediction Using Machine Learning Models,” IEEE, 2021.

Data Sources:

- IMD rainfall datasets
- Kerala Water Authority / river level open data
- Kerala Disaster Management Authority reports
- Public flood datasets

Scope Justification:

- Mini project friendly
- Simple ML models can be implemented
- Real societal impact
- Not too international; fully local to Kerala
- Clear implementation + clear measurable output