

## Project Initialization and Planning Phase

Date	12 June 2025
Team ID	SWTID1749618778
Project Title	Rising Waters: A Machine Learning Approach To Flood Prediction
Maximum Marks	3 Marks

### Project Proposal (Proposed Solution) template

Rising Waters is a predictive system designed to forecast flood events using machine learning. By analyzing environmental data such as temperature, humidity, cloud cover, and seasonal rainfall patterns, the model accurately predicts the likelihood of flooding in a given region. This early warning tool aims to help communities prepare in advance, reduce damage, and enhance disaster response through data-driven insights.

Project Overview	
Objective	To build a machine learning model that predicts the likelihood of flooding using climatic and seasonal rainfall data, helping communities prepare in advance.
Scope	The project focuses on analyzing meteorological factors such as temperature, humidity, cloud cover, and seasonal rainfall (Jan–Feb, Mar–May, Jun–Sep, Oct–Dec), to predict flood events accurately.
Problem Statement	
Description	Communities in flood-prone areas lack access to accurate early warnings. Current systems are often reactive rather than predictive.
Impact	A predictive system will enable authorities and citizens to plan evacuations, safeguard resources, and reduce damage caused by floods.
Proposed Solution	
Approach	Using supervised machine learning algorithms (like Logistic Regression, Random Forest) trained on features such as temperature, humidity, cloud cover, and seasonal rainfall to predict the binary flood outcome (flood/no flood).

Key Features	<ul style="list-style-type: none"> <li>- Feature engineering from seasonal rainfall patterns</li> <li>- Classification model for binary flood prediction</li> <li>- Model explainability using feature importance</li> <li>- User interface with flood risk dashboard</li> <li>- SMS/email alert integration</li> </ul>
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## Resource Requirements

Resource Type	Description	Specification/Allocation
<b>Hardware</b>		
Computing Resources	CPU/GPU specifications, number of cores	1 x NVIDIA V100 GPUs
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
<b>Software</b>		
Frameworks	Python frameworks	e.g., Flask
Libraries	Additional libraries	scikit-learn, pandas, seaborn, numpy, matplotlib
Development Environment	IDE, version control	Jupyter Notebook, Git
<b>Data</b>		
Data	Source, size, format	Kaggle dataset, 115, csv