DATE	28-02-2026
TEAM ID	LTVIP2026TMIDS89043
PROJECT NAME	Rising Waters: A Machine Learning Approach to Flood Prediction
MAXIMUM MARKS	5 MARKS

4.1 PROBLEM SOLUTION FIT

1. The Problem:

Flooding is one of the most destructive natural disasters worldwide, affecting millions of people every year. Key challenges include:

- Unpredictable weather patterns due to climate change
- Delayed or inaccurate flood warnings
- Limited use of real-time data
- Inadequate early response systems
- High economic losses and infrastructure damage

According to global disaster monitoring agencies, floods account for a significant percentage of natural disaster-related damages annually. Many regions, especially developing areas, lack accurate predictive systems that combine historical and real-time environmental data.

Core Pain Points:

- Communities receive warnings too late
- Emergency services lack predictive planning tools
- Governments rely on static threshold-based systems
- Traditional hydrological models struggle with nonlinear patterns

2. Target Users

- Government disaster management authorities
- Environmental agencies
- Urban planners
- Insurance companies
- NGOs working in climate resilience
- Local communities in flood-prone regions

3. Current Solutions & Gaps

Traditional Methods:

- Rule-based flood threshold systems
- Manual rainfall and river-level monitoring
- Satellite-only analysis
- Static hydrological simulation models

Gaps:

- Poor scalability
- Limited predictive accuracy
- Lack of machine learning integration
- Inability to process large multi-source datasets

4. How the Solution Fits the Problem

Problem	Solution Fit
Late warnings	Predictive modeling provides early alerts
Nonlinear weather patterns	ML captures complex relationships
Data fragmentation	Centralized multi-source data pipeline
Static models	Adaptive learning improves over time
Lack of actionable insights	Risk scoring + dashboard visualization