AWARN

1.1 Define Objectives and Goals

Objective Clarification:

- **Primary Objective:** Enhance disaster preparedness and response through a user-centric system that provides timely alerts and instructions.
- **Additional Objectives:** Develop a proposal for a better user interface.

Specific Goals:

- **Prioritized Goals:**
    - Data Analysis
    - Pattern Recognition
    - Risk Assessment
    - Forewarning and alert generation.
- **Additional Goal:** Implement data streaming for real-time automation of risk assessment.

1.2 Identify Scope

Disasters Focus:

- **Initial Focus:** Floods, including flash floods, urban floods, and others based on data availability.
- **Future Expansion:** After refining the flood detection and forewarning system, expand to earthquakes and wildfires.

Geographical Focus:

- **Target Regions:** Indian states including Uttar Pradesh, Bihar, Assam, Maharashtra, Kerala, and West Bengal.
- **Considerations:** Research factors such as population density and historical disaster frequency for a more detailed scope.

Data Sources:

- **Existing Access:** None currently, but preliminary data can be sourced online.
- **Additional Sources:** Explore public databases, satellite imagery, environmental agencies, and governmental monitoring stations.

ML Techniques:

- **Interested Techniques:**
    - Threshold-Based Alerts
    - Rule-Based Systems
    - Ensemble Forecasting Methods
    - Data Assimilation Techniques
    - LSTM Networks
    - Bayesian Networks
    - SAR Data Processing
    - Image Processing and Spatial Analysis
- **Cutting-Edge Techniques:** Consider LSTM Networks and SAR Data Processing for advanced applications.

1.3 Set Project Milestones

Initial Data Collection and Analysis:

- **Timeline:**
    - Data Collection: 2 month
    - Data Analysis and Model Creation: 1 week
    - Alert Generation: 4 days
    - System Integration: 1 week
    - Testing: 2 weeks
    - Deployment: 5 days
- **Challenges:** Maintain data dictionaries and adapt software to varying data formats.

Model Development and Testing:

- **Evaluation Criteria:**
    - Forecast Accuracy
    - False Alarms
    - Missed Alerts

    - Lead Time
    - Real-Time Data Processing
    - Geographical Coverage
    - Communication Channels
    - Feedback Mechanisms
    - Robustness to Failures
    - Operational Costs
- **Timeline:** 2 months for development and testing.

System Integration and Deployment:

- **Integration Timeline:** After 2 months of model development and testing.
- **Challenges:** Building a website, managing callbacks, and preventing overloads.

Evaluation and Impact Assessment:

- **Impact Measurement:**
    - Compare forecasted events with actual occurrences
    - Measure lead time
    - Track false alarms and missed alerts
    - Assess communication effectiveness
- **Metrics:**
    - Hit Rate
    - False Alarm Rate
    - Miss Rate
    - Critical Success Index (CSI)
    - Lead Time
    - Alert Latency
    - Reduction in Casualties
    - Recovery Time