Problem Statement

> *" There is a critical need for a centralized, location-aware, multilingual disaster alert and public awareness platform for flood- and landslide-prone regions of Kerala that delivers verified, real-time warnings and clear safety instructions, ensuring timely public understanding, effective evacuation, and reduced loss of life and property during disaster events."*

❖ Problem Identification

Kerala, a coastal and hilly state in India, is highly vulnerable to recurrent floods and landslides, especially during the monsoon season. Despite the presence of disaster management authorities and media channels, timely, clear, and actionable disaster information often fails to reach all affected citizens, leading to delayed evacuations, panic, misinformation, and avoidable loss of life and property.

❖ What is the Problem?

The primary problem is the absence of a unified, location-based, and multilingual disaster alert and public awareness system for floods and landslides in Kerala. Existing alert mechanisms are fragmented across SMS, social media, television, and radio, often delivering inconsistent, non-localized, or English-only messages that many citizens cannot easily understand or act upon.

❖ Why is it a Problem?

Floods and landslides are time-critical disasters where even a few minutes' delay in understanding a warning can result in:

- people failing to evacuate on time,
- vehicles entering flooded or landslide-prone routes,
- communities underestimating the severity of the threat.

According to state disaster reports, floods and landslides in Kerala have caused hundreds of deaths, displacement of lakhs of people, and economic losses running into thousands of crores of rupees over recent years. A significant portion of this impact is linked not only to the disaster itself, but to delayed or misunderstood warnings.

❖ Who is Affected?

The problem affects:

- Residents of flood- and landslide-prone regions (river basins, hill slopes, low-lying areas),
- Elderly citizens, children, and people with limited digital or English literacy,
- Fisherfolk, farmers, and daily-wage workers who rely on timely information for safety,
- Emergency responders and local authorities, who face coordination challenges due to lack of a centralized public communication system.

❖ Where Does the Problem Occur?

This issue is most prominent in high-risk districts of Kerala, including:

- low-lying flood-prone areas near rivers and backwaters,
- hilly and ecologically sensitive regions vulnerable to landslides,
- rural and semi-urban communities with limited access to real-time digital information.

❖ When Does the Problem Occur?

The problem becomes critical:

- during monsoon seasons (June – September),
- during sudden heavy rainfall events, cloudbursts, or dam releases,
- during night-time or power/internet disruptions, when access to clear information is further reduced.

❖ How Does the Problem Occur?

The problem occurs due to:

- lack of centralized and verified information sources,
- delayed confirmation and dissemination of alerts,
- absence of location-specific severity indicators,
- failure to present alerts in local languages with simple, actionable instructions,
- dependence on citizens to interpret scattered information on their own.

❖ Impact Quantification

- Human Impact: Delayed evacuation leads to preventable injuries and fatalities during floods and landslides.
- Economic Impact: Property damage, crop loss, and disruption of livelihoods cause large-scale economic stress.
- Social Impact: Panic, rumor spread, and confusion reduce public trust in official communication.
- Operational Impact: Emergency services face overcrowding, misdirected rescue efforts, and inefficient resource deployment.

Studies and past flood events in Kerala indicate that early warning and clear communication alone can reduce disaster-related casualties by a significant margin, highlighting the urgent need for improved systems.

❖ **Root Causes :**

The core reasons behind the problem include:

1. **Fragmented Communication Channels**

Disaster alerts are released across multiple platforms without a single authoritative source, leading to confusion.

2. **Language and Literacy Barriers**

Many warnings are issued in English or technical language, limiting comprehension among large sections of the population.

3. **Lack of Location-Based Alerts**

Citizens often receive generic state-wide alerts rather than area-specific warnings relevant to their exact location.

4. **Limited Public Awareness**

Citizens are often unsure how to respond to alerts due to lack of clear instructions and preparedness education.

5. **Absence of Feedback and Visibility**

Authorities lack visibility into how many people have actually received and understood the alerts.