

# NATURAL DISASTER PREDICTION AND MANAGEMENT

## **Problem Statement:**

Natural disasters such as earthquakes, floods, hurricanes, and wildfires pose a significant threat to human life and property. Rapid response and accurate information dissemination are crucial during such events, but affected populations often face delays in rescue and aid. There is a need for a system that can provide real-time assistance, predict risks, and offer guidance without replacing emergency services, but supporting them effectively.

## **Target Audience:**

- People living in disaster-prone areas
- Government disaster management agencies
- NGOs and relief workers
- Individuals seeking real-time updates and help during natural calamities

## **Objectives:**

- To design an AI system capable of offering real-time disaster alerts and response advice.
- To assist users in taking correct safety actions during a disaster.
- To create an accessible platform usable in emergency conditions.
- To ensure user location and data privacy during use.

## **Design Thinking Approach:**

### **Empathize:**

Disaster victims often lack timely, accurate information. They may not know safe routes, shelter locations, or Emergency contacts. Many users fear misinformation or lack tech literacy, especially during panic. The System should focus on trust, ease, and reliability.

**Key User Concerns:**

- Trust in AI during high-stress situations.
- Fear of misinformation or reliance on tech in a disaster.
- Accessibility and ease-of-use in urgent conditions.

**Define:**

The AI assistant should collect data from users (location, type of event, condition) and provide alerts, safety instructions, and recommend actions. It should support offline modes, multi-language, and integrate with Official emergency services.

**Key Features Required:**

- Real-time alert system based on AI and external data feeds.
- Offline functionality and low-bandwidth support.
- Multi-language support with visual cues for easy understanding.
- Strict data privacy and location-based alert filters.

**Ideate:**

- AI chatbot offering guidance during a disaster.
- Mobile app for alerts, safe zones, and instructions.
- Integration with IoT sensors to monitor floods or quakes.
- Push notifications and loud alarms for alerts.

**Brainstorming Results:**

- Voice-activated assistant for hands-free use.
- Visual-based instructions for people with low literacy.
- Crowd-sourced data collection for better accuracy.

**Prototype:**

A basic mobile/web app where users receive real-time alerts, input emergency info, and get safety advice. It Offers location-specific safety tips and connects to local shelters or services.

**Key Components of Prototype:**

- Disaster data and forecast models.
- AI and NLP for processing user queries.
- Alert logic and GPS-based recommendations.

**Test:**

The prototype will be tested with users in disaster-prone regions and emergency response teams. User Feedback will help improve response time, alert accuracy, and ease of use.

**Testing goals:**

Check if alerts are timely and trusted.

- Ensure system is usable under stress and low connectivity.
- Verify clarity and correctness of safety advice