

Title

**Industry / Inhouse Project
Major Project II
Final Review**

Project Mentor:



**Group Number:
Group Members:**

Copyrighted Content

CONTENT

- Introduction to the project
- Problem Definition
- Literature Survey
- Comparison Lacunas of Existing System
- WorkFlow Diagram
- Data Overview
- Multimodal Model
- Implementation
- Conclusion

INTRODUCTION TO THE PROJECT



ResQConnect (रेस्क्यूकनेक्ट): IDEA

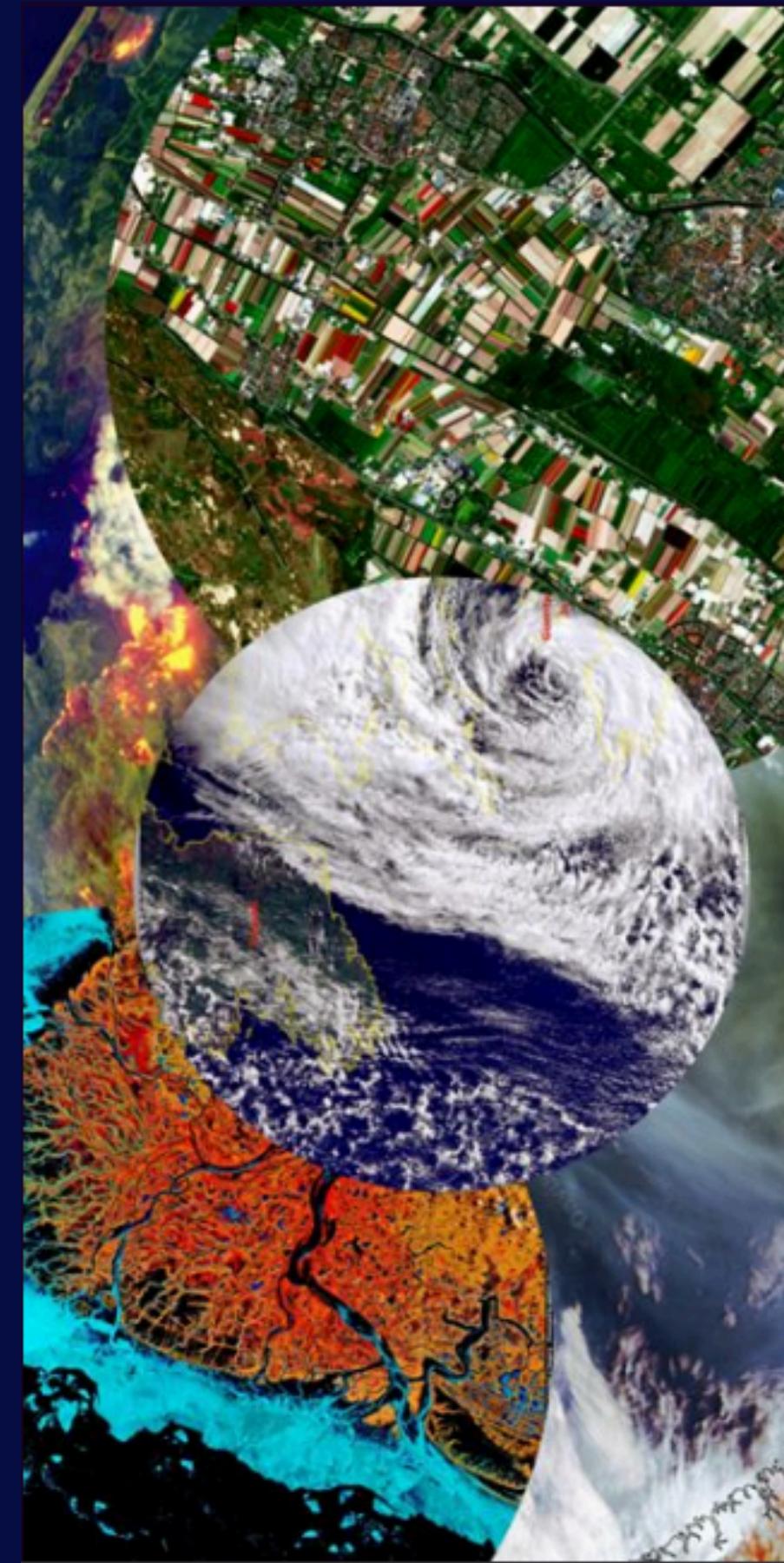
- Comprehensive Disaster Management Platform – ResQConnect streamlines disaster response across all phases, ensuring efficient coordination between officials and the public.
- Public Engagement via Mobile App – Citizens can report disasters, request assistance, and share live updates, enhancing community-driven response.
- Social Media Integration & Analytics – Real-time social media data is analyzed to provide rescue agencies with disaster-specific insights for better decision-making.

PROBLEM DEFINITION



ResQConnect (रेस्क्यूकनेक्ट): IDEA

Disaster response faces delays and communication gaps. ResQConnect bridges this by providing a web platform for officials to respond and a mobile app for users to report disasters. Covering all disaster phases, it ensures faster response, better coordination, and aligns with UN Sustainable Development Goals for resilience and preparedness.



THE GLOBAL GOALS
For Sustainable Development

13 CLIMATE
ACTION



17 PARTNERSHIPS
FOR THE GOALS



11 SUSTAINABLE CITIES
AND COMMUNITIES



LITERATURE SURVEY

Name of the paper	Year	Abstract	Algorithms and Methodology	Limitations
[1] Automatic analysis of social media images to identify disaster type and infer appropriate emergency response	2021	The paper leverages social media and deep learning (VGG-16, YOLO) to classify disaster data and enhance emergency response.	<ul style="list-style-type: none">Developed a disaster taxonomy for emergency categorization.Implemented an emergency response pipeline using deep learning for image analysis.Validated results with card sorting, decision tables, and AHP.Applied the method to real-world scenarios like earthquakes and hurricanes.	<ul style="list-style-type: none">Accuracy depends on deep learning performance and quality training data.Requires incremental training for improved accuracy.Cloud reliance may reduce effectiveness in areas with poor internet connectivity.
[2] Leveraging multimodal social media data for rapid disaster damage assessment	2024	<ul style="list-style-type: none">Disaster response needs fast, accurate damage data for relief and resource allocation.Traditional methods face delays, while social media offers real-time insights.Past research focused on single data types, and current methods are too coarse for city-level operations.	<ul style="list-style-type: none">Uses text and image data from social media.Hierarchical classifiers identify damage types like infrastructure and housing destruction.Extracts disaster-related text using keyword search.	<ul style="list-style-type: none">Social media data can be noisy with irrelevant or false information.Some coarse-grained results may limit precision.Accuracy depends on relevant social media activity during disasters.

PAPER SUMMARY				
Name of the paper	Year	Abstract	Algorithms and Methodology	Limitations
[3] Social Media Driven Big Data Analysis for Disaster Situation Awareness: A Tutorial	2023	Proposes an MCNN technique for predicting mob behavior, extracting features and creating density maps from images.	Preprocessing involves filtering, cropping, and extracting low-level features, with multiple CNNs predicting population density .	Challenges include dense environments, image variability, and dataset dependency.
[4] Opportunities and risks of disaster data from social media: a systematic review of incident information	2023	<ul style="list-style-type: none">The paper examines the role of social media in filling information gaps in disaster management.Traditional data collection methods often result in incomplete or missing information.A review of 37 disaster and incident databases was conducted.The study highlights both benefits and limitations of using social media data in disaster management systems.	<ul style="list-style-type: none">Data Collection: Utilized bibliometric mapping and systematic literature review from Web of Science (WoS) to gather relevant papers.Analysis: Categorized and synthesized research on DSSs, data management solutions, and AI for SAR.Dataset Preparation: Followed PRISMA guidelines for data screening and filtering, focusing on studies from 2017 to 2021.	<ul style="list-style-type: none">Data Quality: The reliability and accuracy of social media data are questioned due to misinformation, noise, and inconsistencies in posts.Incomplete Information: Social media often lacks comprehensive coverage of disaster events, providing only fragmentary details.Temporal Delays: There can be delays between the occurrence of incidents and their reporting on social media, impacting real-time analysis.

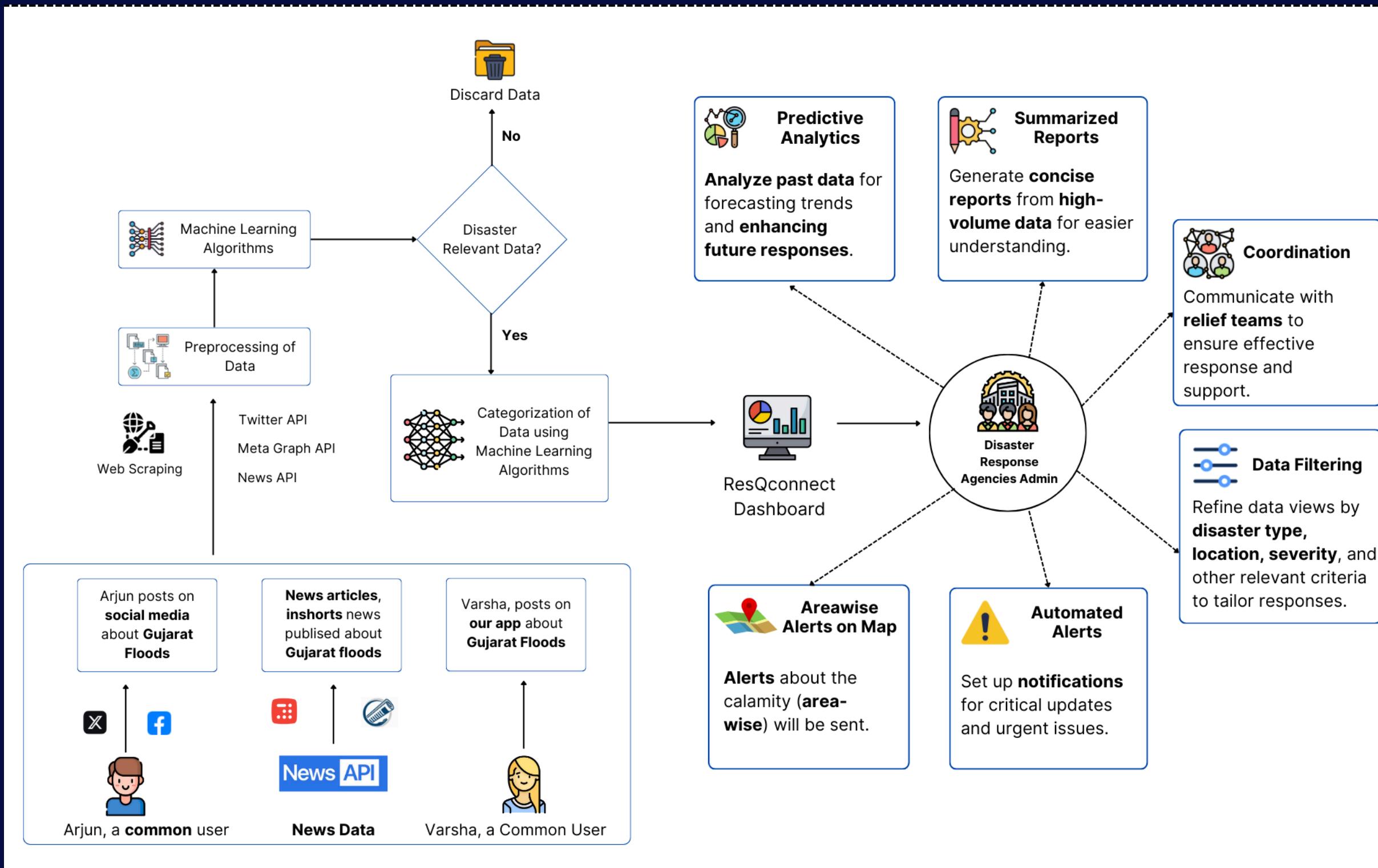
COMPARISON AND LACUNAS OF EXISTING SYSTEMS

Existing Systems	Their Purpose	Limitations	Our Solutions
 NDMA	<ul style="list-style-type: none">To formulate policies, plans, and guidelines for disaster management at the national level.	<ul style="list-style-type: none">Focused on policy and planning; lacks real-time updates during disasters, which hinders immediate response.	<ul style="list-style-type: none">Data collection from multiple data sources and using real time data using API integrations.
	<ul style="list-style-type: none">Provides information and resources for disaster preparedness and response.	<ul style="list-style-type: none">Data not frequently updated; relies on user-generated content, which vary in accuracy and reliability.	<ul style="list-style-type: none">User uploaded content is checked for its reliability and severity and then considered for further insights.

COMPARISON AND LACUNAS OF EXISTING SYSTEMS

Existing Systems	Their Purpose	Limitations	Our Solutions
PruTech iResponse	<ul style="list-style-type: none">A mobile app designed for emergency response coordination and information dissemination.	<ul style="list-style-type: none">Limited geographic coverage; does not include all types of disasters or provide comprehensive local resources.	<ul style="list-style-type: none">Application for users to post photos thus covering all types of disasters
	<ul style="list-style-type: none">Helps users report emergencies and receive alerts during disasters.	<ul style="list-style-type: none">Requires internet connectivity, which is unreliable in affected areas; can be ineffective in remote locations.	<ul style="list-style-type: none">Stores data in local storage and syncs with the backend on getting the internet connection

WORKFLOW DIAGRAM



>>> Enlarge View

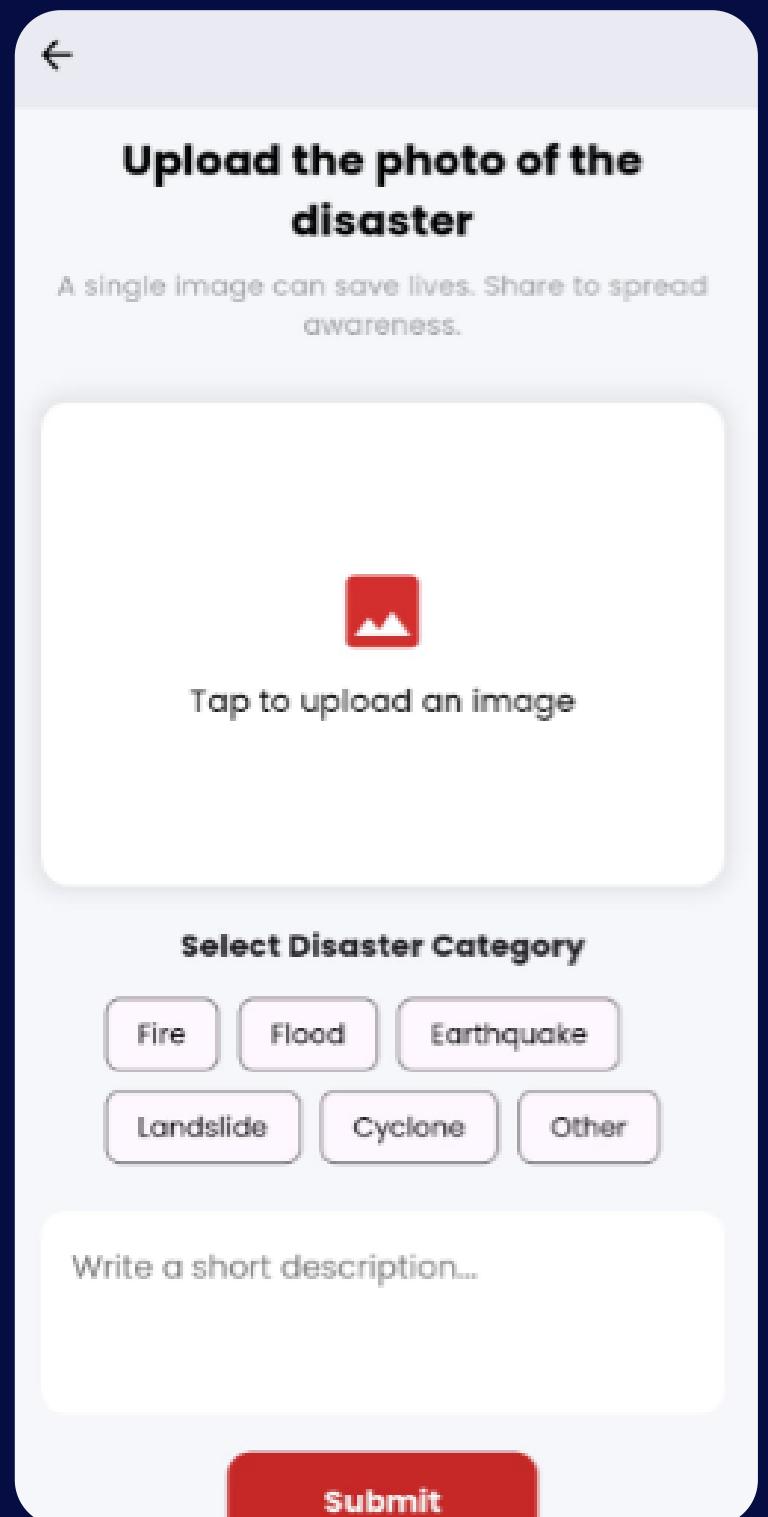
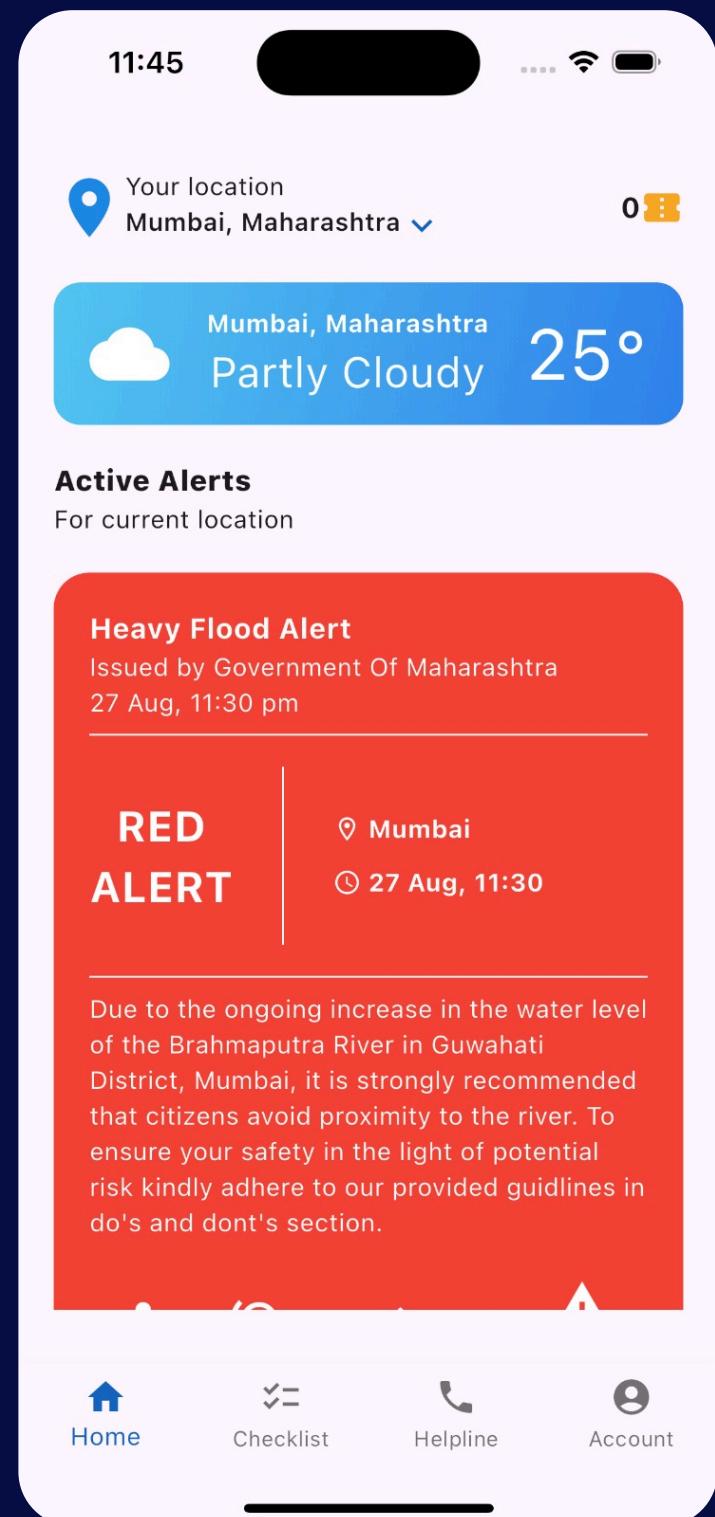
DATA OVERVIEW

- Web scraped data from social media platforms for disaster insights
 -  **RapidAPI** It provides open source scraping tool to scrape data from X(Twitter)
- Getambee for real-time disaster data collection
 -  Disaster specific social media data to train, test and validate model
- Serp API to gather disaster-related news
 -  Open data source to gather relevant disaster specific news data
- Data from data.gov.in and NDMA for training ML models with historical data

DATASET

	filename	tweet	label	image
0	ad_2017-11-25_10-36-26.txt	⭐ We are really getting into the christmas spi...	non_damage	ad_2017-11-25_10-36-26.JPG
1	building_2017-10-30_17-26-34.txt	IJOY uv board has the competitive price and ve...	non_damage	building_2017-10-30_17-26-34.JPG
2	floodwater_2017-09-04_04-46-10.txt	Arriving in Kalkundi island destroyed in #bang...	flood	floodwater_2017-09-04-46-10.JPG
3	accrafloods_2015-06-06_16-59-56.txt	Hi my lovelies, check out My first hand exper...	flood	accrafloods_2015-06-06_16-59-56.JPG
4	buildingfire_2016-10-02_03-07-17.txt	The Hamilton fire service during an exercise a...	fires	buildingfire_2016-10-02_03-07-17.JPG

>>> [Dataset Link](#)



Input

>> Image

>> Text

Multimodal
Model

VALIDATE AND FILTER DISASTER SPECIFIC DATA

Keyword-based filtering:

Use relevant keywords and hashtags associated with the disaster type (e.g., "fire", "earthquake", "flood") to initially filter tweets related to the event.

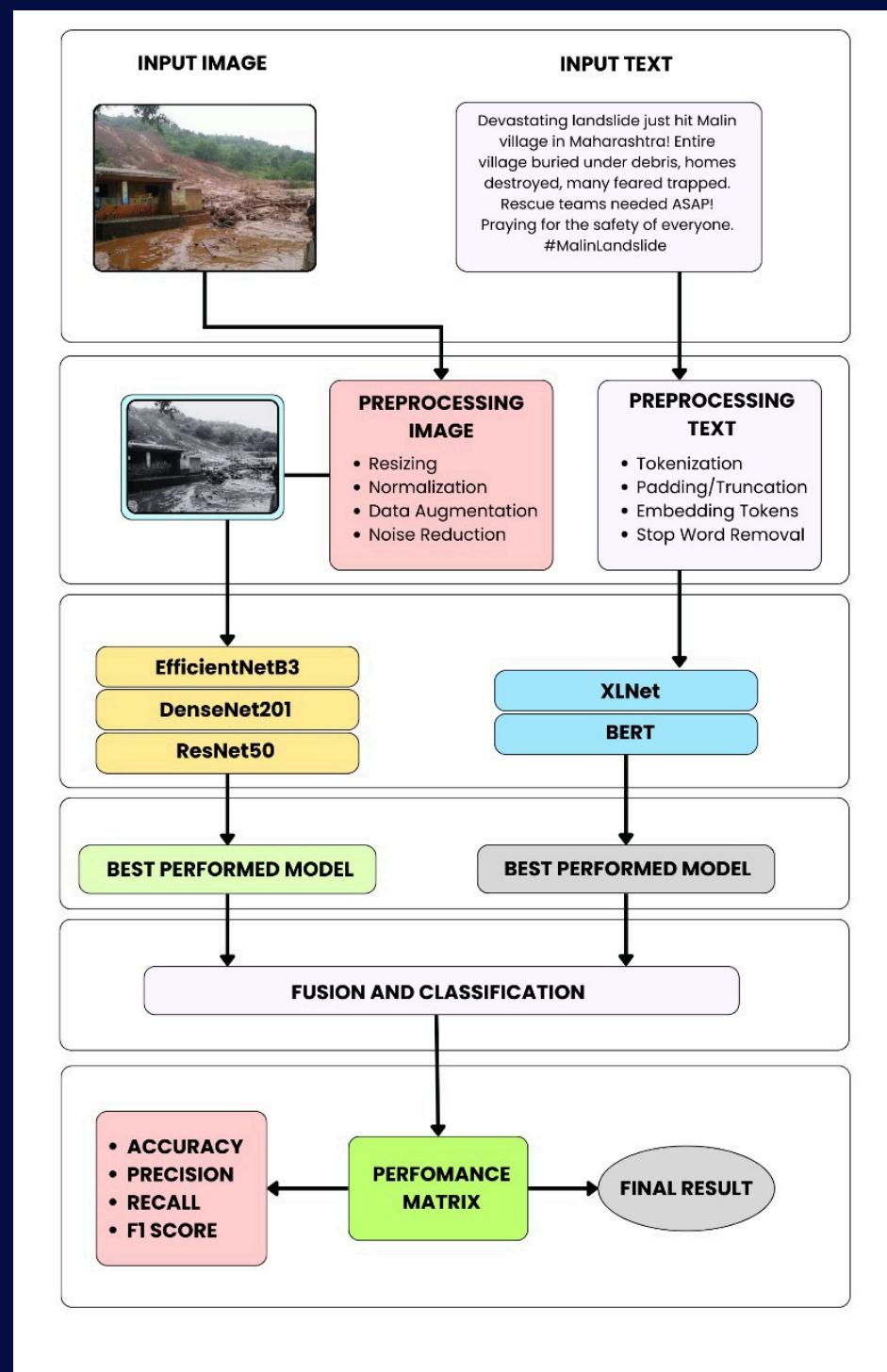
Geolocation filtering:

Utilize geolocation data from tweets to identify tweets originating from the affected area.

Time-based filtering:

Limit the data collection window to the relevant timeframe of the disaster event.

MULTIMODAL MODEL ARCHITECTURE



>>> Accuracy and Loss

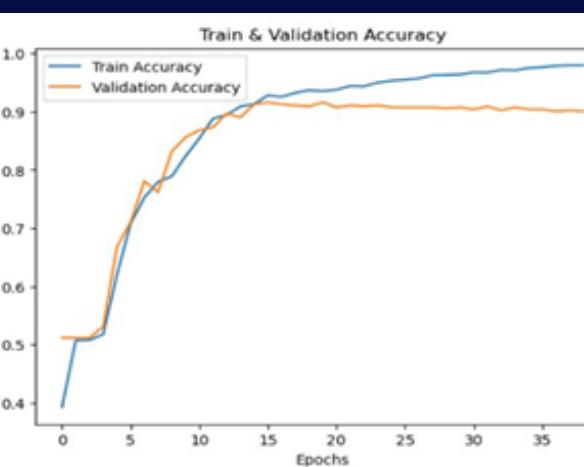


Fig 3. Train & Validation Accuracy Over Epochs

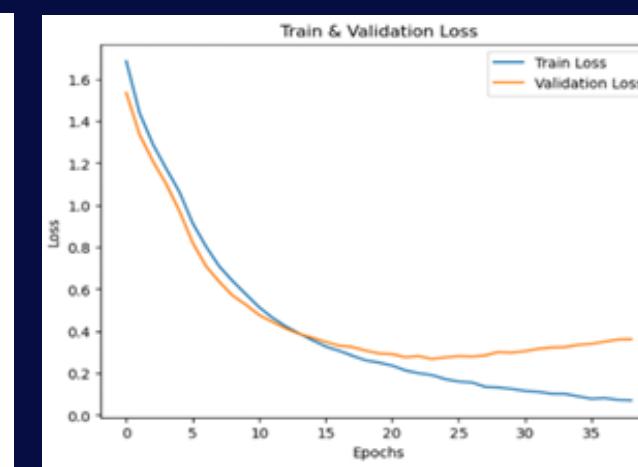
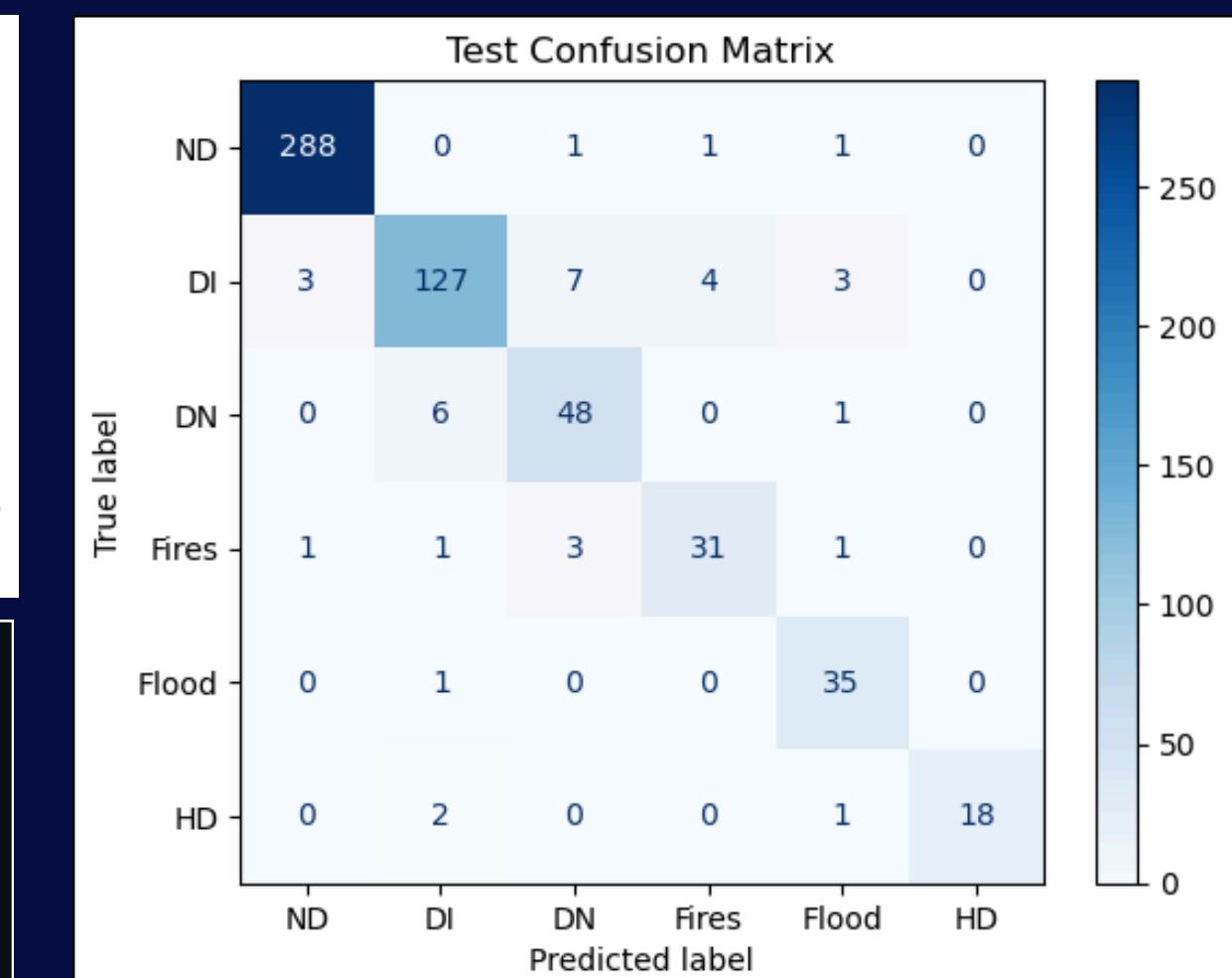


Fig 4. Train & Validation Loss Over Epochs

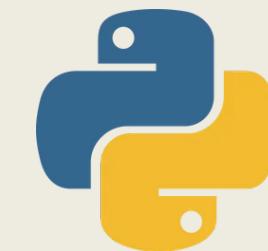
Classification Report:

	precision	recall	f1-score	support
non_damage	0.99	0.99	0.99	291
damaged_infrastructure	0.93	0.88	0.90	144
damaged_nature	0.81	0.87	0.84	55
fires	0.86	0.84	0.85	37
flood	0.83	0.97	0.90	36
human_damage	1.00	0.86	0.92	21
accuracy			0.94	584
macro avg	0.90	0.90	0.90	584
weighted avg	0.94	0.94	0.94	584



>>> Enlarge View

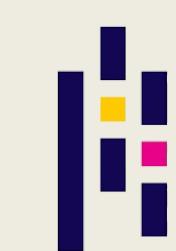
TECHNOLOGY STACK

Data**Preprocessing**

Python



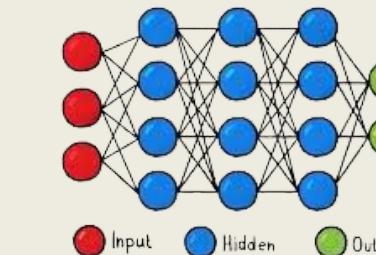
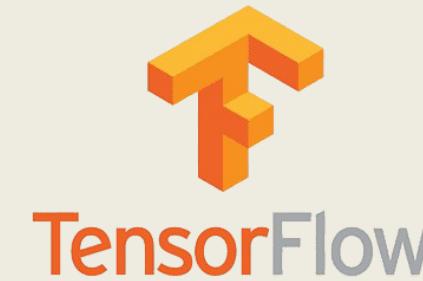
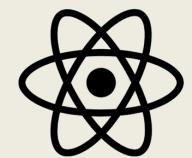
Rasterio



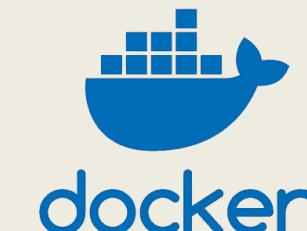
Pandas



Keras

**Model**Neural
Networks**EfficientNet - BERT****Frontend**

React

**Backend**

IMPLEMENTATION >> RESQCONNECT WEBSITE

The screenshot shows the ResqConnect website's overview page. At the top left is the ResqConnect logo. The top right features a search bar with placeholder text "Search..." and a clock icon showing "00:30:49". On the far right are icons for a user profile, a bell, and a camera. Below the header is a sidebar with links: Overview (selected), Social Media Posts, Issues, Resource Management, Past Disasters, News, YT News, and Agency Details. The main content area has a title "Disaster Management Overview" and a circular progress bar labeled "Total: 8". To its right are four status boxes: "Ongoing: 3", "Contained: 2", "Resolved: 3", and "Total Affected: 328,000". A "Active Alerts" section shows a single entry: "Flash flood warning in Mumbai suburbs" from "Mumbai, Maharashtra" at "00:30:36". Below these are tabs for "Interactive Map" (selected) and "Timeline Analysis", followed by buttons for "Markers", "Heatmap", and "Impact Zones", and dropdown menus for "Select disaster types", "Select severity levels", and "Select status". A "Enter Drawing Mode" button is also present. At the bottom is a search bar with placeholder text "Search disasters..." and a map of South Asia and parts of Central Asia and China. The map shows various regions and cities, with some areas highlighted in green.

Disaster Management Portal overview page

IMPLEMENTATION >> RESQCONNECT WEBSITE

The screenshot shows the ResqConnect website interface. On the left, a sidebar menu includes options like Overview, Social Media Posts (which is selected), Issues, Resource Management, Past Disasters, News, YT News, and Agency Details. The main content area is titled 'Disaster Management Dashboard' and features a search bar with the query 'Delhi earthquake'. It displays a 'Wildfire Event #W-2023-092' with details: Current Status (Active), Start Time (09/16 06:30 AM), Location (Delhi), and a Critical level. Below this is an 'AI-Powered Analysis' section with tabs for Overview, Sentiment Analysis, Impact Prediction, and Resource Planning. An 'AI-Generated Situation Summary' box provides a detailed report on severe flooding in Kerala, mentioning over 12,000 hectares submerged and 45% inaccessible areas. A 'Recent Tweets' section shows a tweet from @bhushi_m_k about the Delhi earthquake. The right side of the dashboard includes an 'Event Summary' box with affected area (15,700 acres), containment (35%), evacuation status (Mandatory for Zones A1-A5), personnel deployed (450), evacuation centers (12 at capacity), and weather conditions (Wind: 18-25 mph NW, Humidity: 12%, Temperature: 92°F). A 'Key Accounts to Monitor' section lists @ndmaindia (National Disaster Management Authority), @PIB_India (Official government updates), and @indiannavy.

AI Generated
Summarization of
related tweets

IMPLEMENTATION >> RESQCONNECT WEBSITE

The screenshot shows a web browser window for the ResqConnect website at localhost:5173/tweets. The left sidebar includes links for Overview, Social Media Posts (which is selected), Issues, Resource Management, Past Disasters, News, YT News, and Agency Details. The main content area displays a "Recent Tweets" feed:

- @bhushi_m_k** (@chocomoccoo) - Us me delhi vale earthquake kyu aa rhe (28/02/2025, 23:49:45)
- @bhaskarlivein** - #CAGReport on health infrastructure in Assembly to be presented by Delhi CM Rekha Gupta today . . . #CAG #DelhiCM #DelhiAssembly #RekhaGupta #BJP #AAP #Prabhas #Avisha #GRAMMYS #SikandarTeaser #ChampionsTrophy2025 #WWERaw #earthquake #Picoin <https://t.co/9rFNroYfZr> <https://t.co/jrN82LXnd6> (28/02/2025, 22:31:00)
An image of a woman speaking at a podium in a formal setting is shown.
- @anandshahin** (@stayaway_001 @DonKarnage28) - Earthquake delhi pahoch gaya tha😂😂 (28/02/2025, 21:33:31)
An image of a man and a woman in a formal setting is shown.
- @ManishM1415915** (@Delhiite_) - A very massive earthquake is bound to occur at the junction of indo-eurasian plate, there is a frequent movement of the plates, anyday anytime a earthquake of any magnitude between 7.5-9 and above can occur and that will affect up,Bihar,hp,ut,Jammu,delhi,n-e region for sure. (28/02/2025, 20:41:36)

The right side of the interface features a sidebar with recent tweets from official accounts:

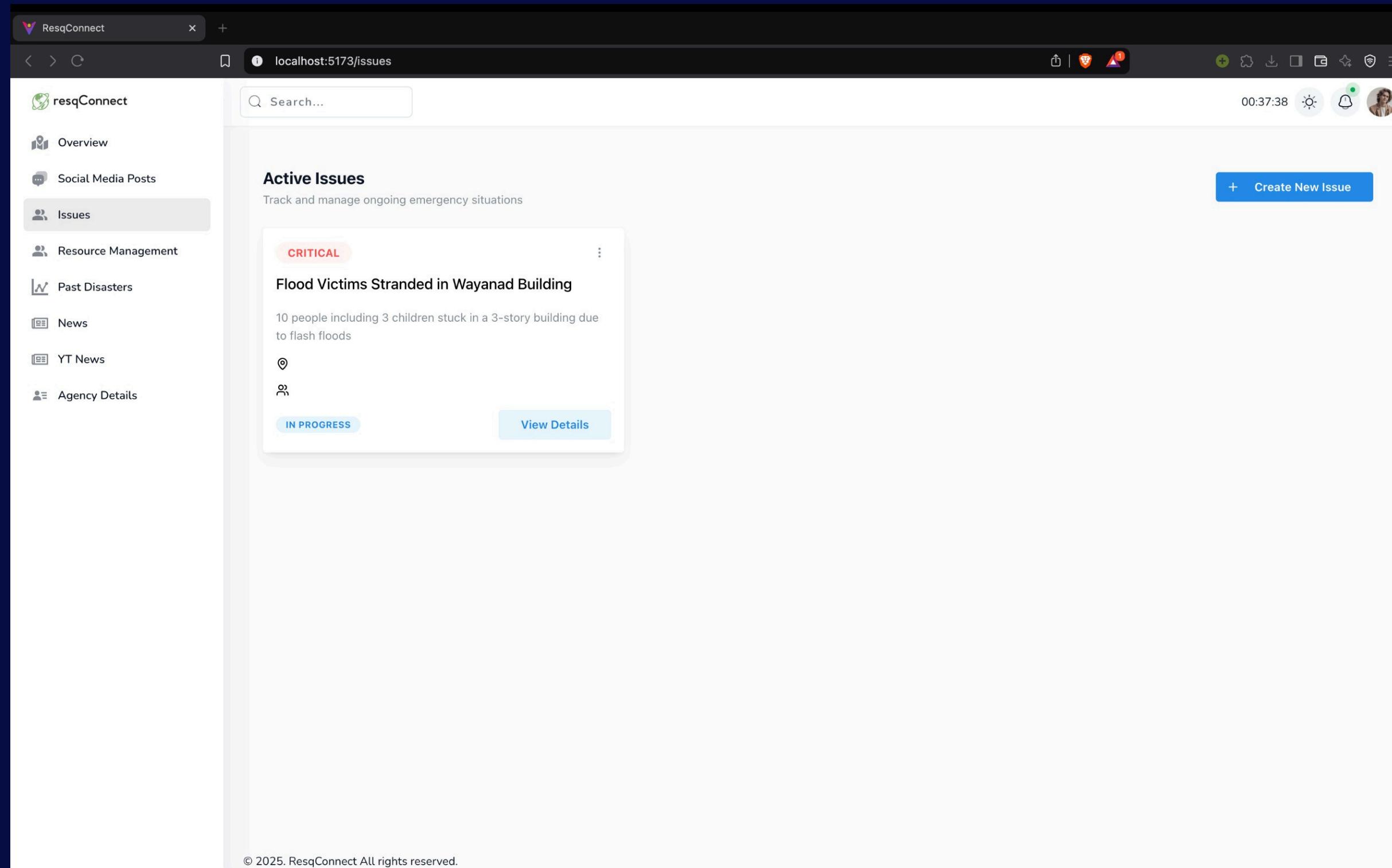
- @ndmaindia National Disaster Management Authority
- @PIB_India Official government updates
- @indiannavy Emergency rescue operations
- @IMDWeather India Meteorological Department

At the bottom right is an "Action Center" with three buttons:

- Send Emergency Alert
- Update Evacuation Zones
- Share Situation Report

Latest and ontrend disaster related tweets

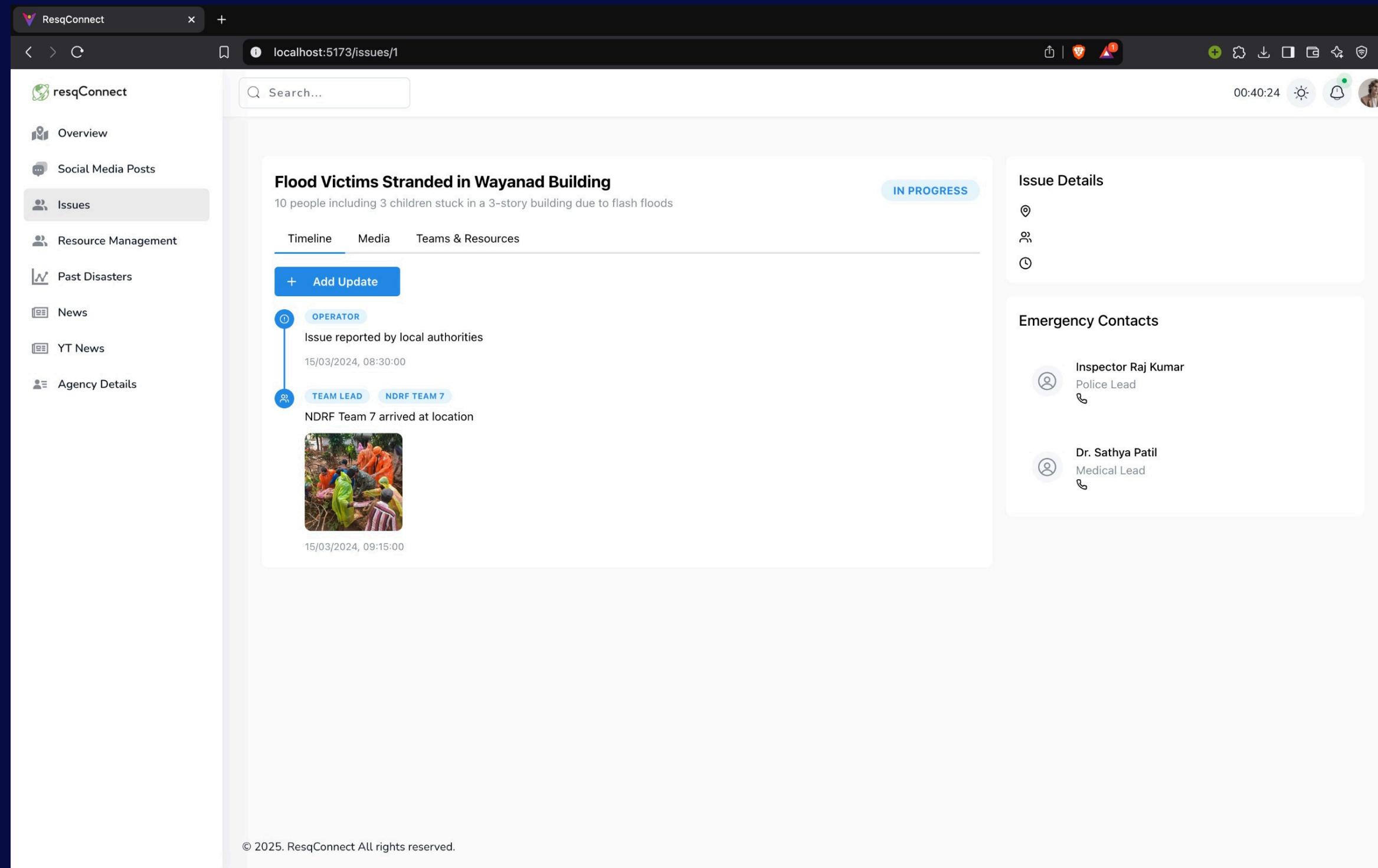
IMPLEMENTATION >> RESQCONNECT WEBSITE



The screenshot shows a web browser window for the ResqConnect website, accessed via localhost:5173/issues. The left sidebar contains navigation links: Overview, Social Media Posts, Issues (which is selected), Resource Management, Past Disasters, News, YT News, and Agency Details. The main content area is titled 'Active Issues' and sub-titled 'Track and manage ongoing emergency situations'. It features a 'Create New Issue' button. A single issue is listed: 'Flood Victims Stranded in Wayanad Building' (CRITICAL). The issue details state: '10 people including 3 children stuck in a 3-story building due to flash floods'. There are location and user icons, and buttons for 'IN PROGRESS' and 'View Details'.

Raise Issues or Alerts

IMPLEMENTATION >> RESQCONNECT WEBSITE



The screenshot shows a web browser window for the ResqConnect platform. The URL in the address bar is `localhost:5173/issues/1`. The main content area displays an issue titled "Flood Victims Stranded in Wayanad Building". The issue status is "IN PROGRESS". The timeline shows two updates:

- OPERATOR:** Issue reported by local authorities on 15/03/2024, 08:30:00.
- TEAM LEAD:** NDRF TEAM 7 arrived at location on 15/03/2024, 09:15:00. This update includes a thumbnail image of relief workers in orange gear.

The sidebar on the left includes links for Overview, Social Media Posts, Issues (which is selected), Resource Management, Past Disasters, News, YT News, and Agency Details. The footer at the bottom left reads "© 2025. ResqConnect All rights reserved."

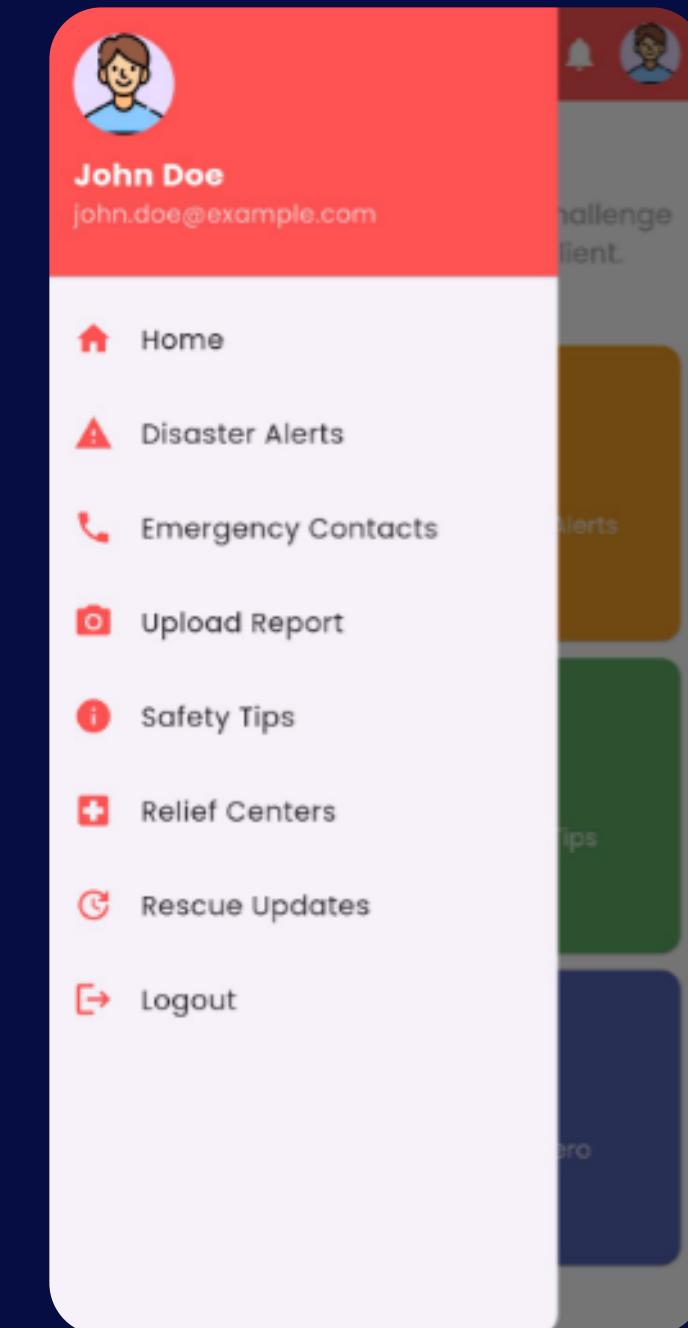
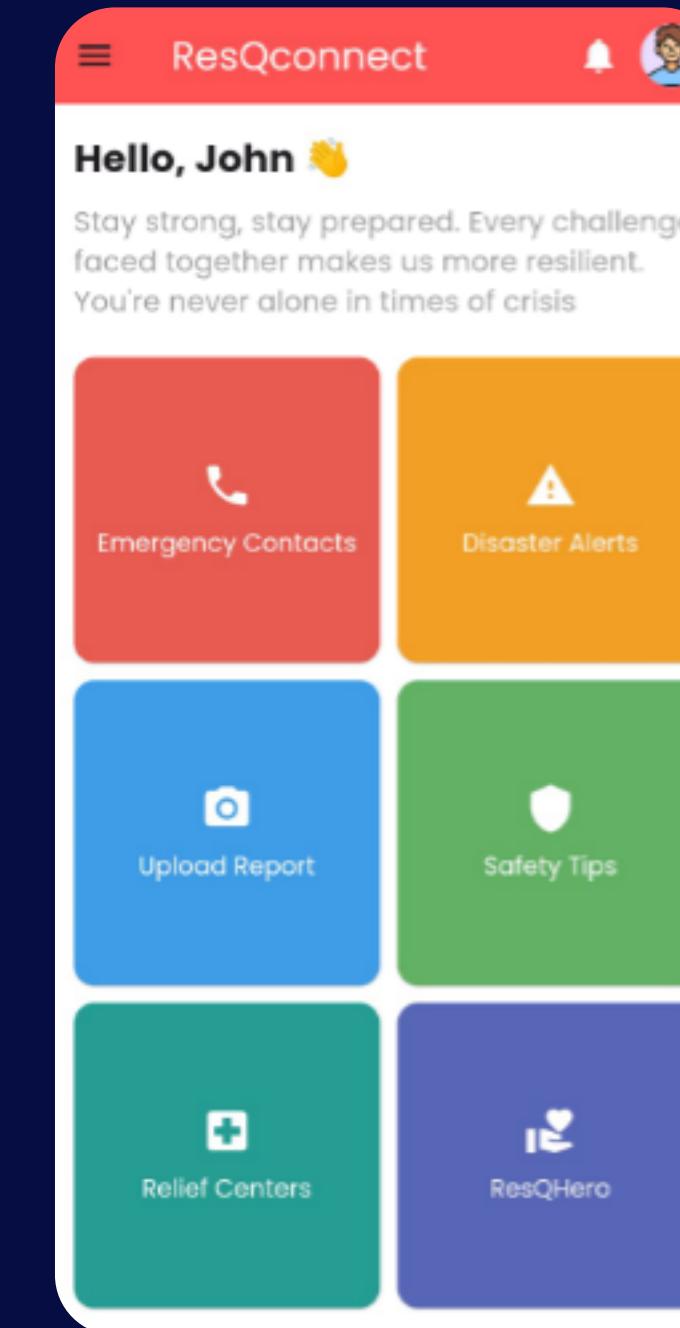
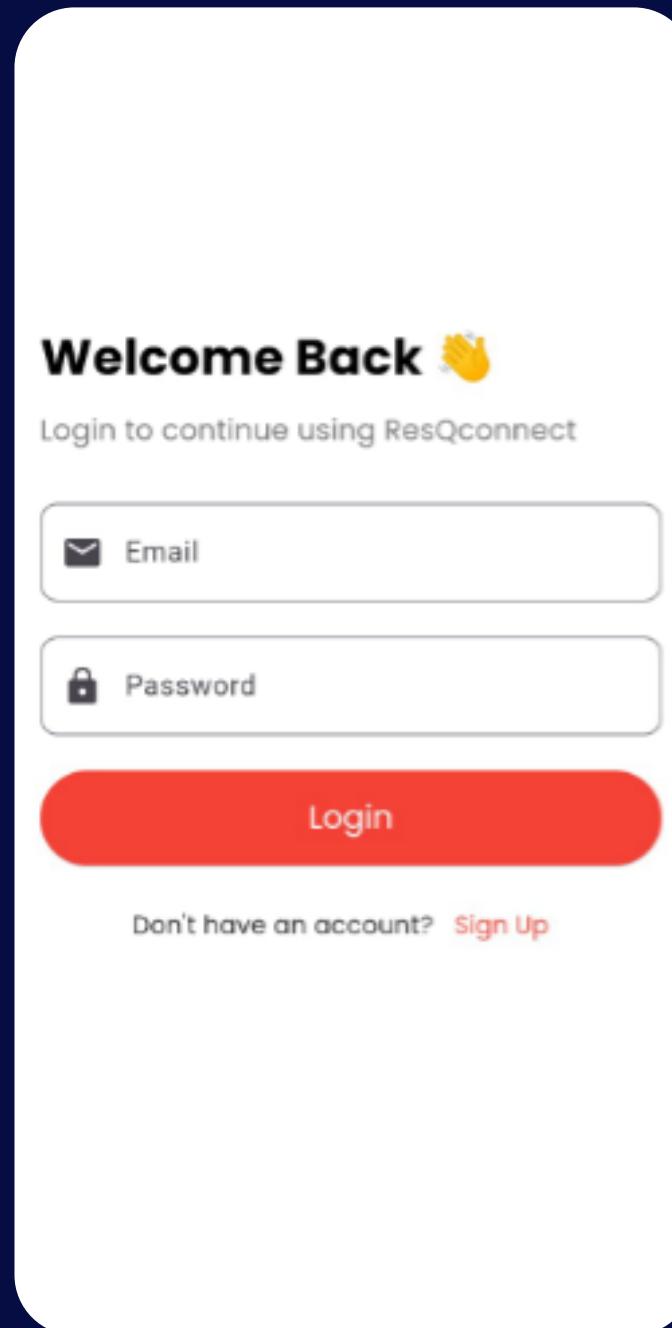
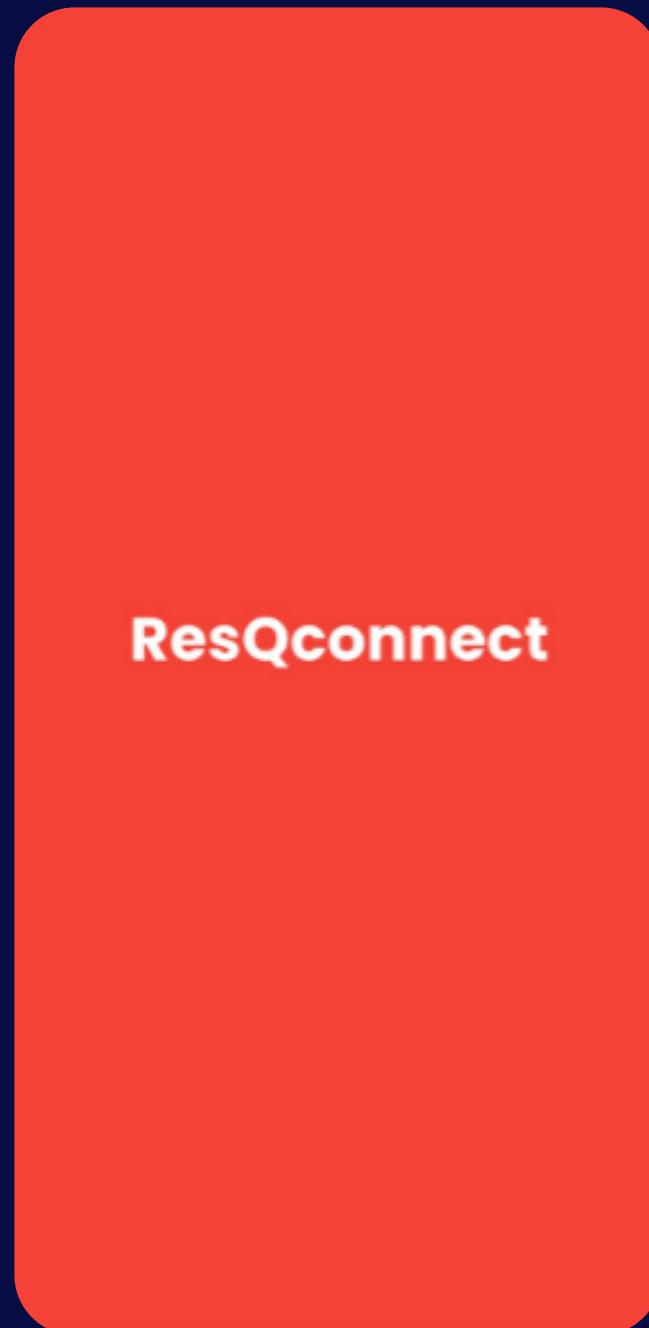
Track the issue and
relief assistance

IMPLEMENTATION >> RESQCONNECT WEBSITE

The screenshot shows a web browser window for the ResqConnect website at localhost:5173/youtube-news. The interface includes a sidebar with links like Overview, Social Media Posts, Issues, Resource Management, Past Disasters, News, YT News (which is selected), and Agency Details. The main content area features a "News Channel Analysis" section with filters for Language, Region, and Time (Last 24 Hours) and a "Refresh Data" button. Below this is a "Translation Management" section for a "Flood Alert in Wayanad District". It shows a verified translation from Malayalam to English: "Original: വയനാട് ജില്ലയിൽ കനത്ത മഴ തുടർന്നു. ബൻടുക്ക പ്രദേശത്ത് വെള്ളം കയറി. Translation: Heavy rain continues in Wayanad district. Water entered Bandukka area." Tags for Flood, Rain, and Wayanad are listed at the bottom. A copyright notice at the bottom left reads "© 2025. ResqConnect All rights reserved."

Identify local news channels and translate their content to english

IMPLEMENTATION >> USER APP



IMPLEMENTATION >> USER APP

Do's and Don'ts



Flood Earthquake Fire

Live Updates

Flood Alert in Mumbai
Severe flooding expected in low-lying areas

Earthquake Tremors in California
Magnitude 4.8 earthquake detected

Community Reports

John Doe
Flooding near riverbanks, roads blocked

[See More](#)

Disaster Alerts

Live Disaster Updates

Stay updated with real-time disaster alerts and take necessary precautions.

Flood Alert in Mumbai
Severe flooding expected in low-lying areas. Stay indoors and avoid traveling near water bodies.

Earthquake Tremors Detected
Magnitude 4.8 earthquake recorded in California. Be prepared for aftershocks.

Cyclone Warning Issued
Cyclone expected to make landfall in coastal areas. Evacuate if necessary.

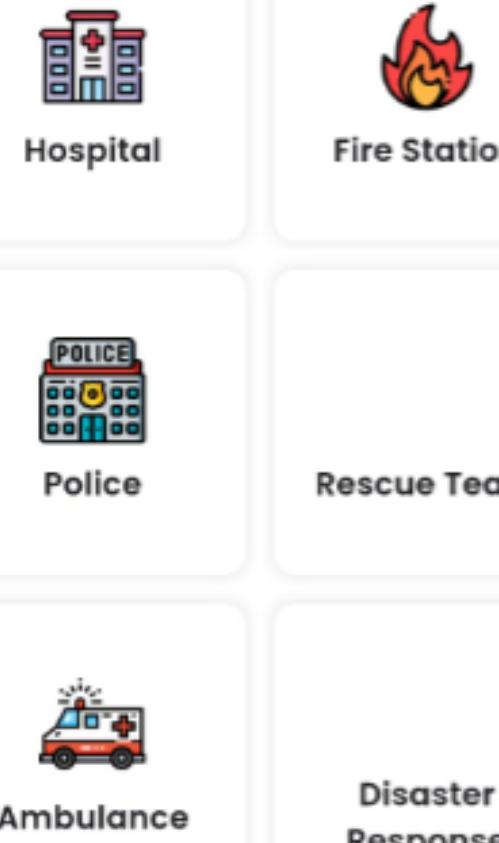
Wildfire Spreading Rapidly
High risk of fire spread in California forests. Authorities are working to contain it.

Emergency Contacts

Select a Service

Please enter your location

Find emergency contact numbers based on your location.



Hospital Fire Station

Police Rescue Team

Ambulance Disaster Response

Upload the photo of the disaster

A single image can save lives. Share to spread awareness.



Tap to upload an image

Select Disaster Category

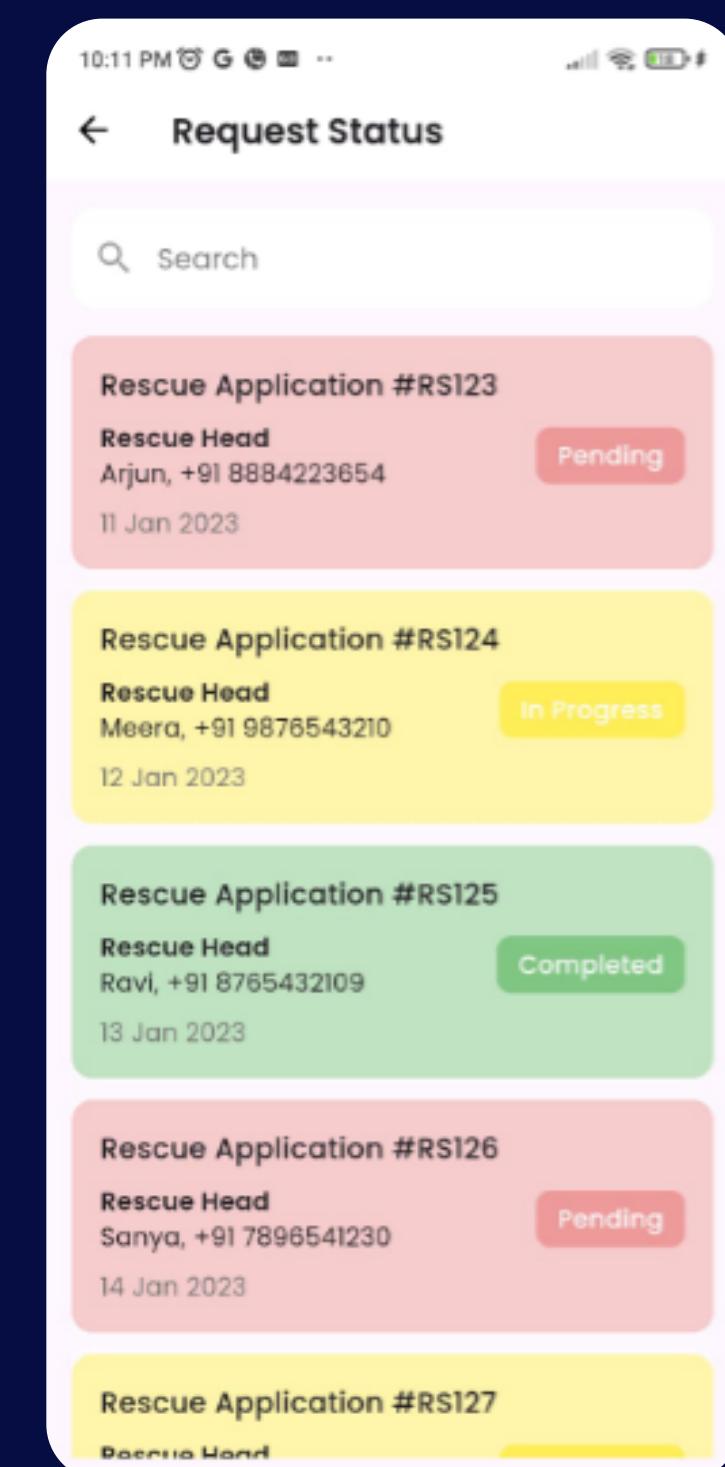
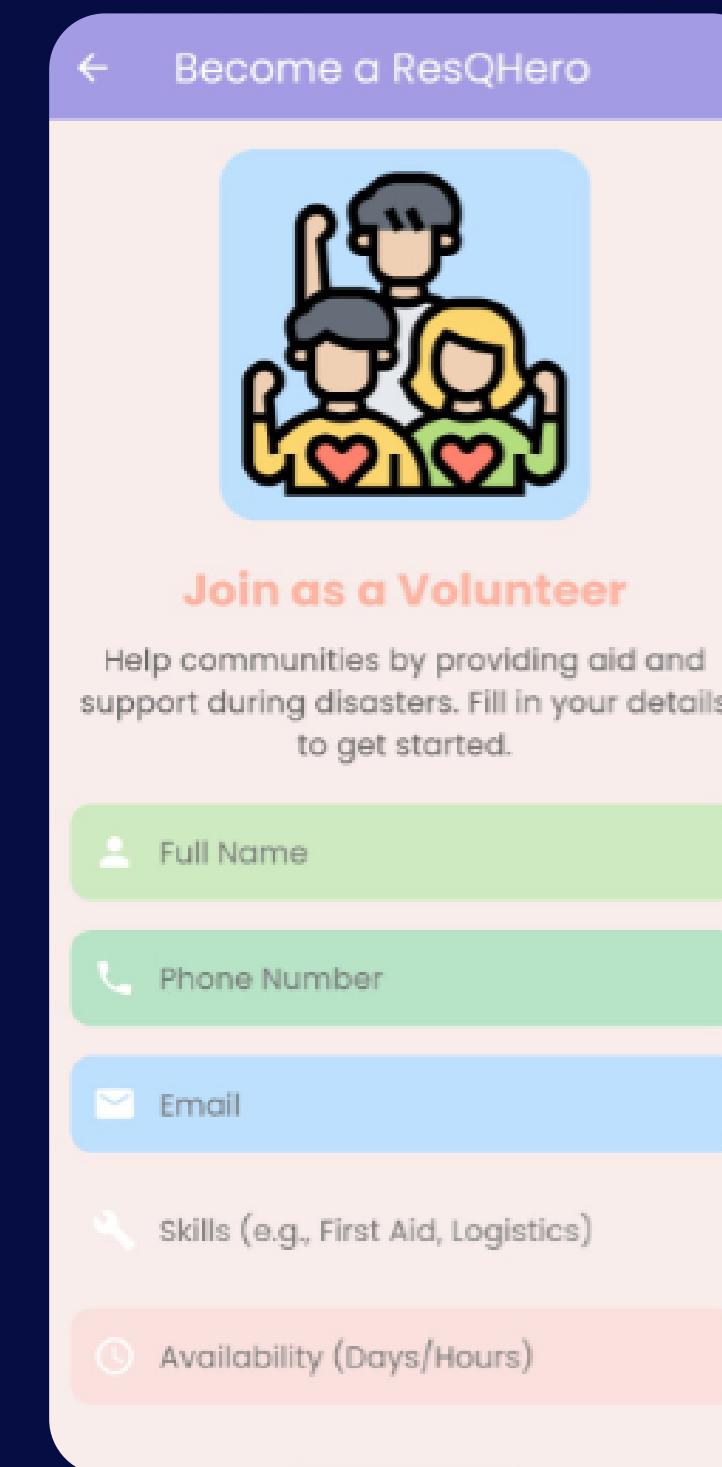
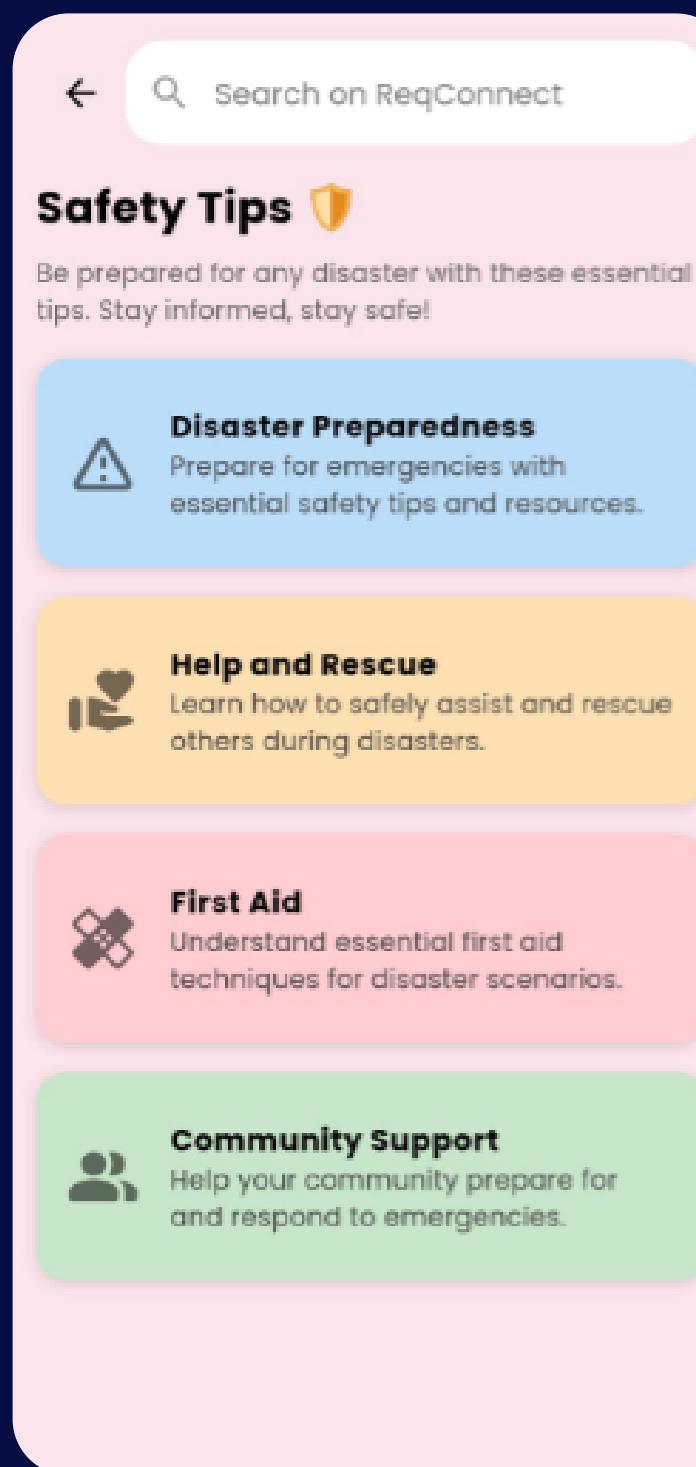
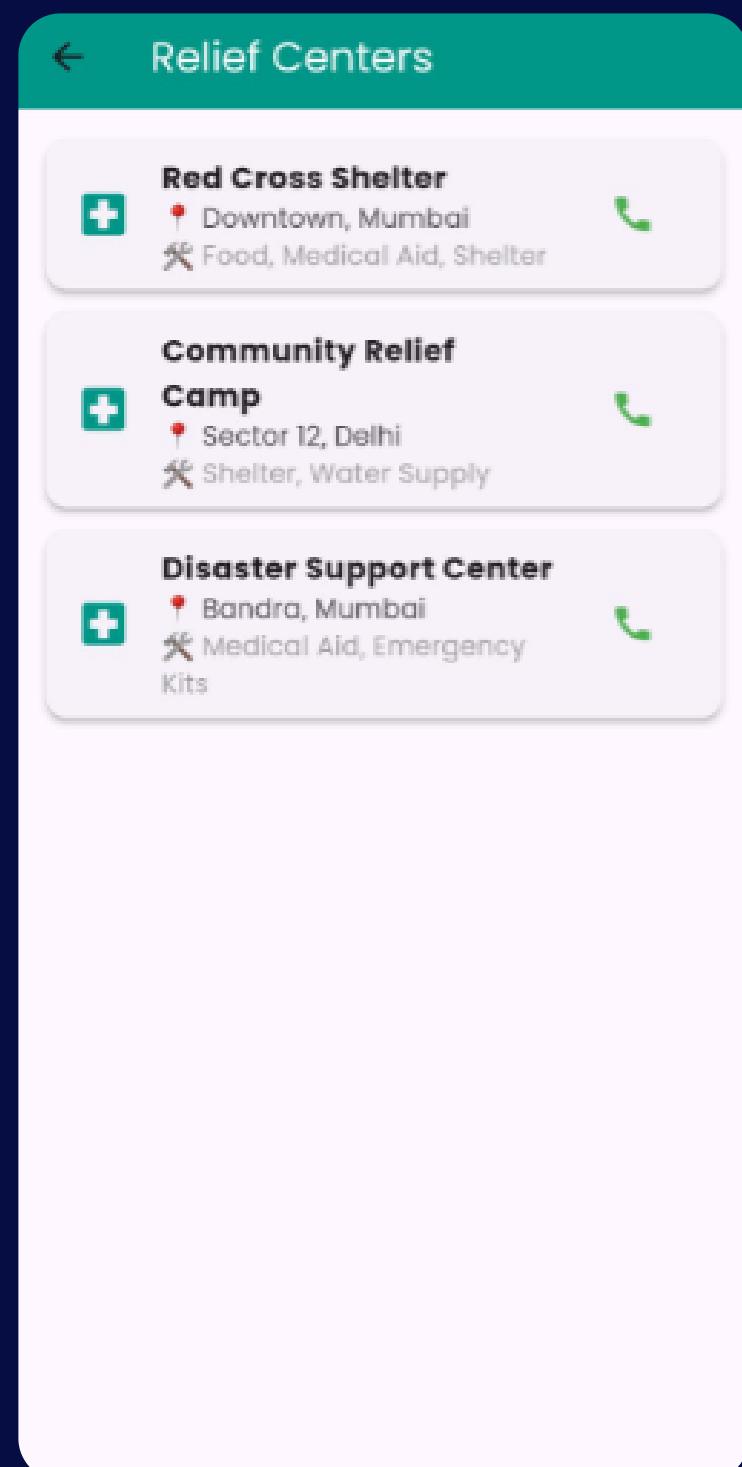
Fire Flood Earthquake

Landslide Cyclone Other

Write a short description...

Submit

IMPLEMENTATION >> USER APP



CONCLUSION

- **Transformative Solution:** Our AI-powered platform will significantly enhance disaster preparedness, response, and recovery.
- **Advanced Capabilities:** It will Integrate real-time data analytics, communication, and automated decision-making.
- **Empowers Responders:** It will provide emergency teams with actionable insights for efficient disaster management.
- **Fosters Collaboration:** It will enable seamless coordination among stakeholders for a unified response.

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THANK YOU!

