

iRescue : Disaster Risk Management Application

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Abstract— Urban cities are likely more prone to disasters like floods, earthquakes and more. Cities do not have the spontaneous preparedness to deal with disasters. Building a disaster resilience system would positively impact the safety and precautions of the people. The main domains we should consider are to issue alerts, provide emergency response to the victims and provide medical advice. The web app enables issuing common and government alerts. The mobile app enables people to contact emergency services and provide medical assistance.

I. SIGNIFICANCE OF THE TOPIC

Cities are highly susceptible to disasters due to their close concentration of people, infrastructure, and resources. Poor planning and uncontrolled urban expansion increase the risk of disasters, with inadequate building structures and transportation systems. The informal settlements often lack basic services like sanitation, healthcare, and education, leading to poor living conditions and increased vulnerability to disease and disasters. Urban areas also contribute to pollution, deforestation, and environmental degradation, contributing to climate change. Disasters cause significant loss of life, property damage, economic disruption, and human suffering. Cities lack adequate preparedness like early warning systems and evacuation procedures. Strengthening disaster resilience is a key challenge under SDG 11.

II. iRescue WEBAPP [2]



Fig 1 Disaster Safety App

1. Homepage Localization

To address the linguistic diversity within communities, the website employs an innovative homepage translation feature where users can experience content in their local language, fostering a more inclusive and accessible environment.



Fig 2 Multi language support

2. User-Generated Alerts

The "Common Alert" feature allows anyone with access to the platform to issue disaster alerts of various types including natural events like earthquakes, hurricanes, floods, or human-made emergencies such as fires or industrial accidents. Common alerts can include text messages, images, and geographic data to inform and update other users about the situation. This empowers individuals, local organizations, and communities to quickly share crucial information when they spot a potential disaster or emergency situation. The decentralized nature of this feature encourages swift response, especially in cases where official government agencies might not be immediately available.

Common Alerts			
Date And Time	Location	Disaster	Description
2023-12-04 17:45:36	গুৱাহাটী	কৃষি জোড়া	মেঝে
2023-12-04 17:45:51	ବ୍ୟାକ୍ରିମ୍ବନ୍ଦୀ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:46:03	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:46:18	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:46:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:46:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:46:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:47:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:47:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:47:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:47:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:48:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:48:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:48:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:48:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:49:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:49:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:49:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:49:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:50:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:50:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:50:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:50:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:51:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:51:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:51:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:51:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:52:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:52:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:52:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:52:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:53:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:53:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:53:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:53:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:54:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:54:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:54:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:54:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:55:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:55:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:55:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:55:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:56:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:56:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:56:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:56:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:57:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:57:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:57:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:57:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:58:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:58:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:58:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:58:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:59:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:59:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:59:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 17:59:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:00:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:00:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:00:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:00:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:01:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:01:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:01:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:01:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:02:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:02:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:02:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:02:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:03:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:03:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:03:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:03:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:04:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:04:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:04:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:04:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:05:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:05:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:05:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:05:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:06:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:06:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:06:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:06:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:07:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:07:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:07:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:07:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:08:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:08:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:08:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:08:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:09:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:09:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:09:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:09:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:10:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:10:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:10:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:10:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:11:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:11:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:11:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:11:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:12:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:12:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:12:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:12:58	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:13:13	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:13:28	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:13:43	ଭାରତ	ପ୍ରତିକାଳୀନ	ଚାନ୍ଦ
2023-12-04 18:13:58	ଭାରତ	ପ୍ରତି	

where official information is paramount. Government alerts may include official statements, evacuation notices, safety instructions, and other information relevant to disaster management.

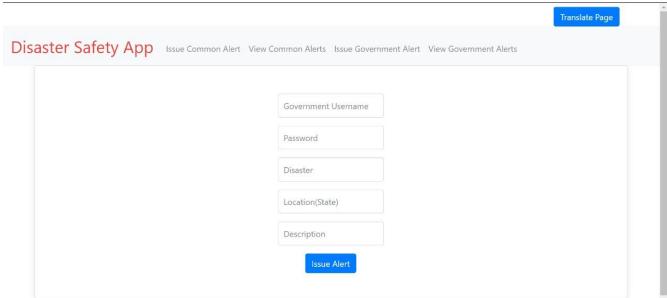


Fig 4 Issue government alert

4. Secure Authentication and Authorization

To streamline communication from authoritative sources, a secure government alert system has been implemented. Strict authentication protocols, including user IDs and passwords, ensure that only authorized personnel can broadcast alerts.

5. Simultaneous Multilingual Broadcasting

Government users can issue alerts via SMS to the entire user base within a specified area. The platform facilitates simultaneous translation into multiple languages, catering to the diverse linguistic preferences of the population.

Government Issued Alerts			
Date And Time	Location	Disaster	Description
2023-12-05 03:48:06	தமிழ்நாடு	ஈராகாபாளி	நெடுஞ்செழியல் பூஷை அறிக்கை உடனடிக்கூறுத் தொழிலாளிகளுக்கு
2023-12-05 03:45:49	தமிழ்நாடு	ஈராகாபாளி	நெடுஞ்செழியல் பூஷை அறிக்கை உடனடிக்கூறுத் தொழிலாளிகளுக்கு
2023-12-04 16:59:06	கனக்காலி	ஈராகாபாளி	நெடுஞ்செழியல் பூஷை அறிக்கை உடனடிக்கூறுத் தொழிலாளிகளுக்கு
2023-12-04 16:52:19	பிரதி	ஈராகாபாளி	நெடுஞ்செழியல் பூஷை அறிக்கை உடனடிக்கூறுத் தொழிலாளிகளுக்கு
2023-12-04	குஜராத்	ஈராகாபாளி	நெடுஞ்செழியல் பூஷை அறிக்கை உடனடிக்கூறுத் தொழிலாளிகளுக்கு

Fig 5 Government alerts



Fig 7 Disaster Alert received

III. iRescue MOBILE APP [1]

1. User authentication

The application incorporates user authentication backend services by linking with Firebase, utilizing login and sign-up interfaces, as illustrated in Fig. 8

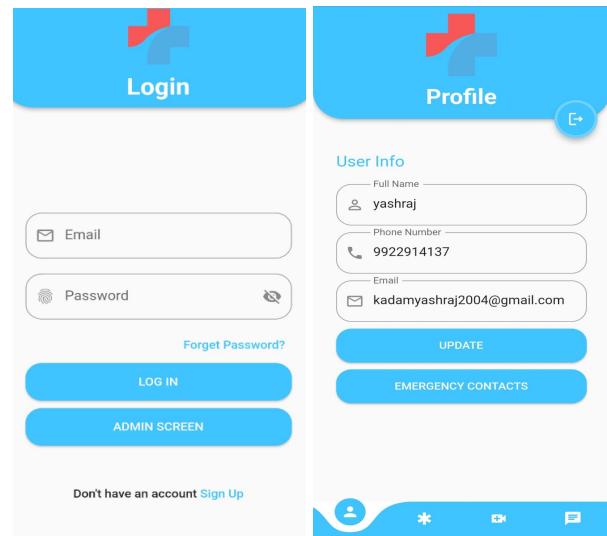


Fig 8. Login and sign up pages

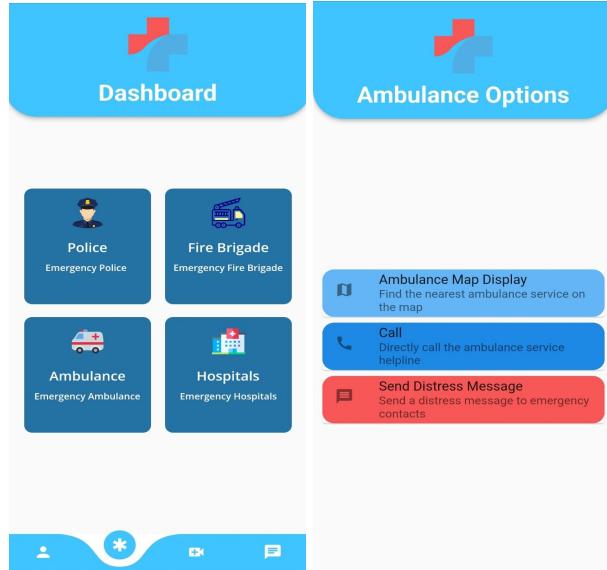


Fig 9a.Dashboard

Fig 9b. Ambulance options

2. Dashboard

Figure 9a showcases the app's dashboard, presenting four primary emergency options: Police, Fire Brigade, Ambulance, and Hospitals. Each option encompasses three distinct sub-features: map display, call, and sending distress messages. Fig. 9b specifically illustrates these three features within the ambulance option. The ambulance map display

feature assists users in locating the nearest ambulance service, demonstrated in Fig. 10a. The 'Call' function directly connects users to the ambulance service helpline. 'Send Distress Message' feature enables users to send distress messages containing their location and details of the emergency to Emergency Contacts (Fig. 12a).

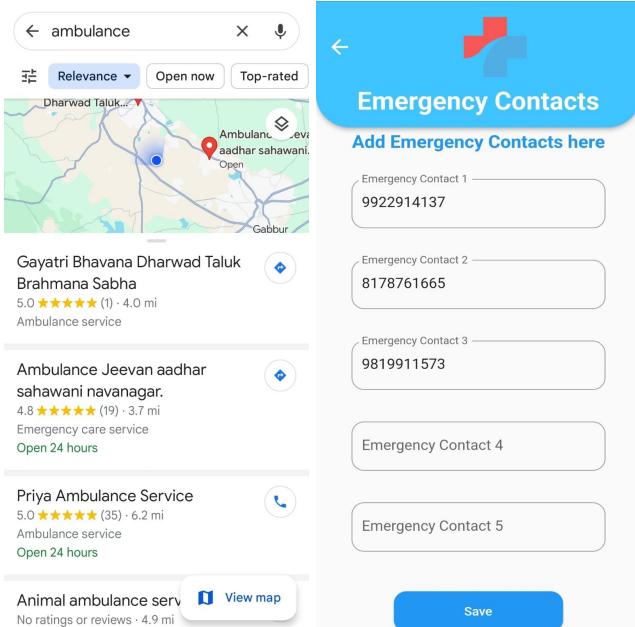


Fig 10 Ambulance Map Display and emergency contacts

3. SOS [3]

Live video stream emergencies enable remote assessment and facilitate appropriate responses. Users can add emergency contacts as in Fig 10b. On clicking the SOS button, a message containing the live stream ID and location is sent to the emergency contacts as shown in Fig 11a. The emergency contacts can login to the app to enter the live stream ID to join the live streaming (Fig 11b) enabling users and their emergency contacts to communicate effectively using the integrated chat feature.

4. iRescue bot [5]

This feature assists you for basic medical treatments/first-aid responses for various symptoms and emergencies (Fig. 12b).

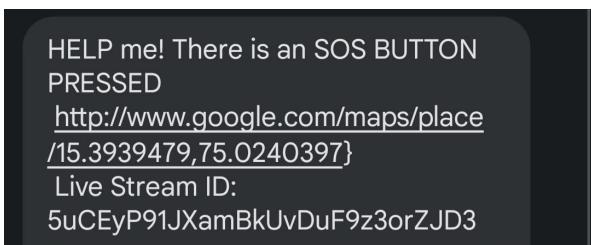


Fig 11a. Emergency message

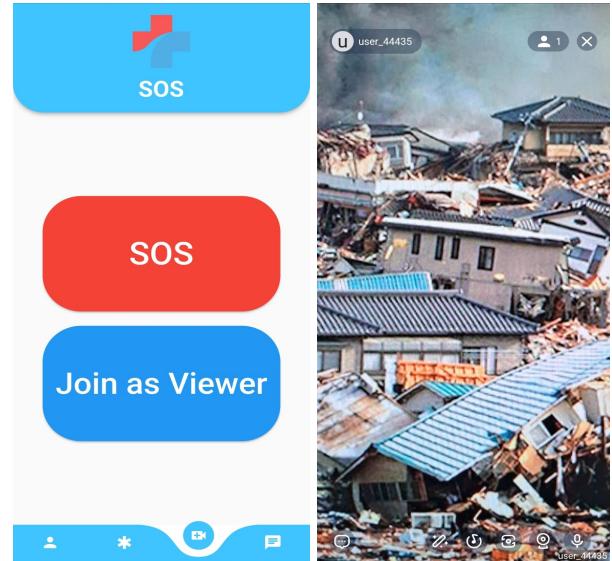


Fig 11b. Depicting the SOS feature and live stream

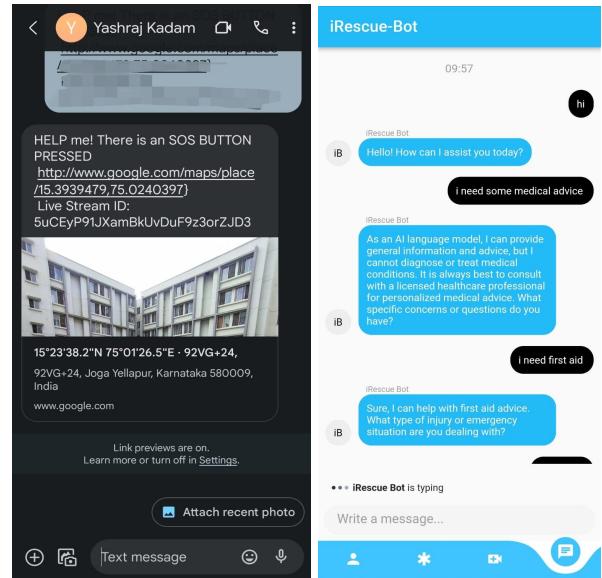


Fig 12a. Emergency message Fig 12b. iRescueBot

IV. FUTURE SCOPE OF WORK

Our commitment to advancing disaster management focuses on a predictive platform, utilizing historical data and advanced machine learning to forecast potential disasters. By analyzing past incidents and incorporating technologies like Geographic Information System (GIS), our system aims for continuous monitoring and real-time assessment of environmental factors. The platform automates alerts, ensuring multilingual communication and community engagement.

V. CONCLUSION

The iRescue Application offers a multi-faceted approach, combining a Disaster Management Website and a feature-rich iRescue Mobile App/WebApp. The Disaster Management Website serves as a crucial hub for providing emergency responses and issuing common alerts from the public and verified government alerts in their local languages. The iRescue Mobile App contains features like user authentication, quick access to emergency services (police, fire, ambulance, hospitals) with map displays, direct calls, and distress messaging. Live video streaming aids remote assessment, while integrated chat facilitates and chatbot provides basic medical guidance for various emergencies.

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