

Distress Connect



Discover



Alert



Communicate



Manage



Model

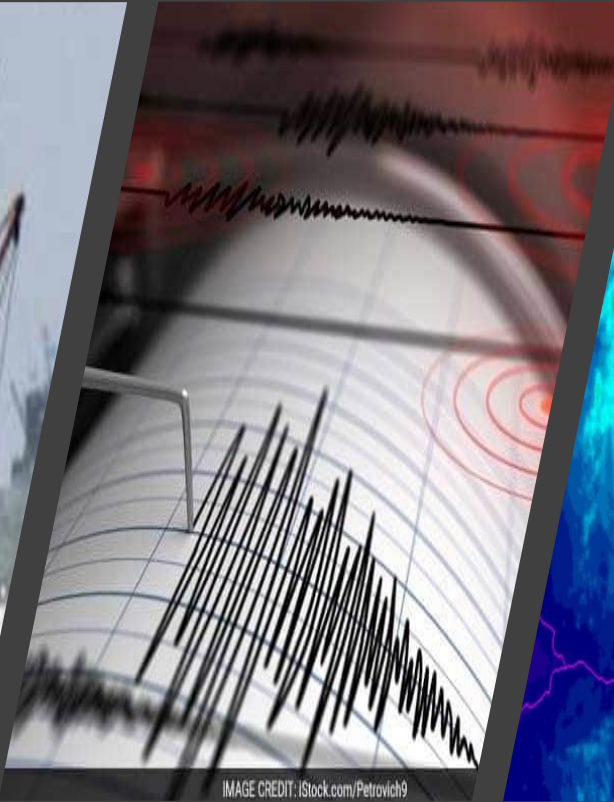
# Customizing Solution Backbone For Each Disaster



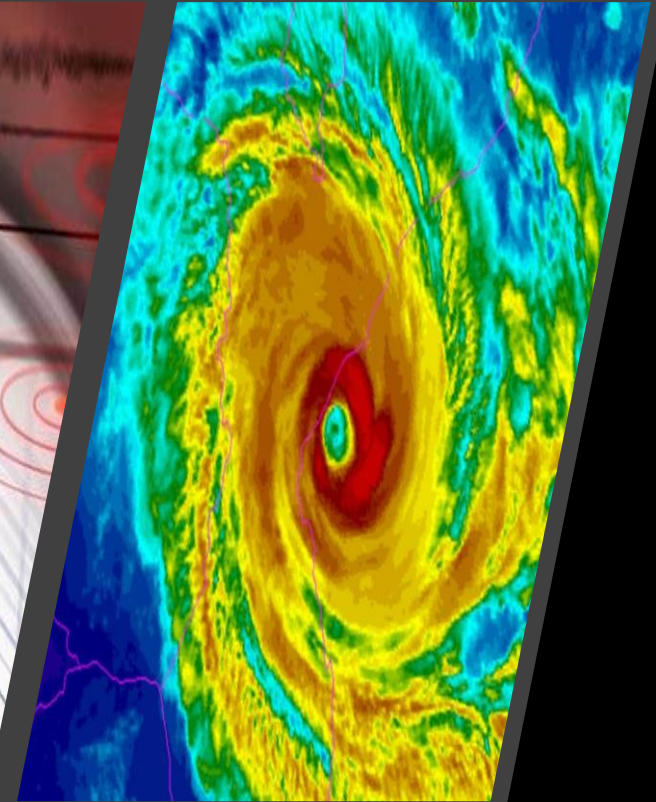
**GLOF**



**High Tide Alert for  
Fishery Boat**



**Earthquake**



**Cyclone**

## Scenario After Natural Disasters

After super cyclones / Tornados existing communication towers are damaged and takes weeks to restore and creates difficulties to plan and execute rescue/restoration works.



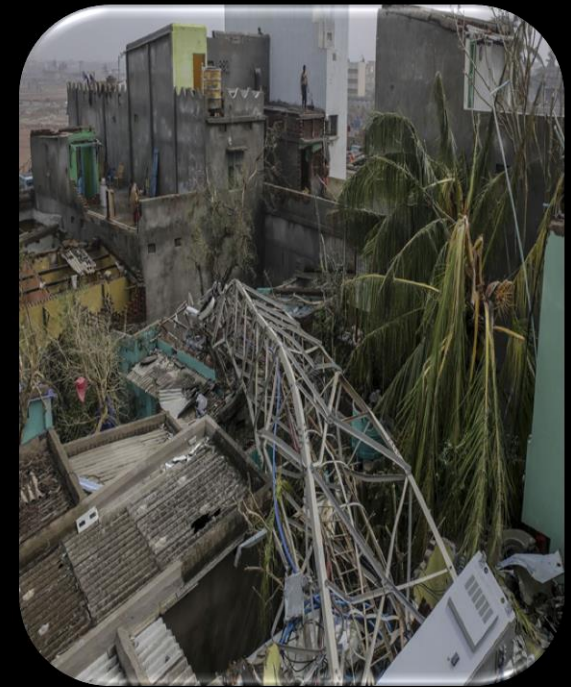
AFTER TORNADO



AFTER FLOOD



AFTER EARTHQUAKE

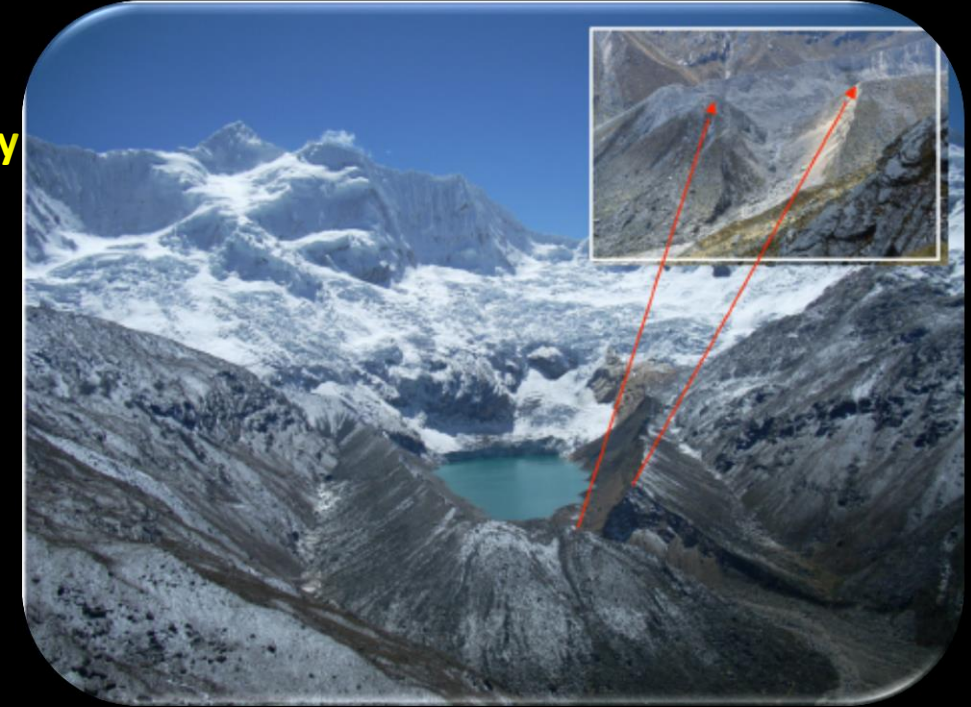


AFTER CYCLONE



## Scenario - 1 GLOF

- Glacial lakes poses extremely big threat for Himalayan States in terms of Glacial lake outburst floods(GLOF). As of 2018, **there are 25614 glacial lakes** in Hindu Kush Himalayan(HKH) **region. More than 50 GLOFs already happenend in HKH area.**
- Glacial **lakes covering area is 1444 sqkm**, and there is no conventional communication system, except satellite. Very few lakes in Sikkim area have observatory connected via satellite communication and rest are still not connected. Real time observation/sensing is need of the hour for timely alert of **GLOF and save millions of people staying in these areas.Kedarnath GLOF intself killed more than 1 lakh people** and changed the life of a million people fo ever.



**Causes of GLOF:** Earthquake, avalanche, Cloud burst rain. Earthquake in high altitude areas like glaciers and glacial lakes are not properly mapped for alarming GLOF.

### Detection:

- Accelerometer for realtime detection of earthquakes and avalanches .
- Doppler radar for measuring precipitation, Water level sensor for lakes.



The total 1444 sq km can be covered by LoRa WAN for realtime detection, prediction and relay the potential GLOF to targetted audience and all stake holders

Accelerometer  
3d camera  
Doppler radar  
Waterlevel Sensor  
on board Analytics



- Multiple accelerometer fitted near periphery of lake will detect earthquake and avalanche in realtime.
- Doppler radar fitted near lake will detect actual precipitation upon lake.(Funded by Govt.)
- Multiple water level sensor will record water level and will also calculate rate of change of water level.
- Video Analytics using 3D camera to detect the structural or morphological changes within and around the glaciour lakes and convert into text format to transmit using LoRa.
- Analytical model that will integrate data from accelerometer / Doppler radar and will compare with water level sensor and will predict the potential GLOF at least few minutes before actual GLOF and will relay the alert to groud station and viillage LoRa Bill boards, LoRa Mobiles and Cell broad cast in possible affecting areas to help people to move to safe place, well before actual arrival of GLOF.

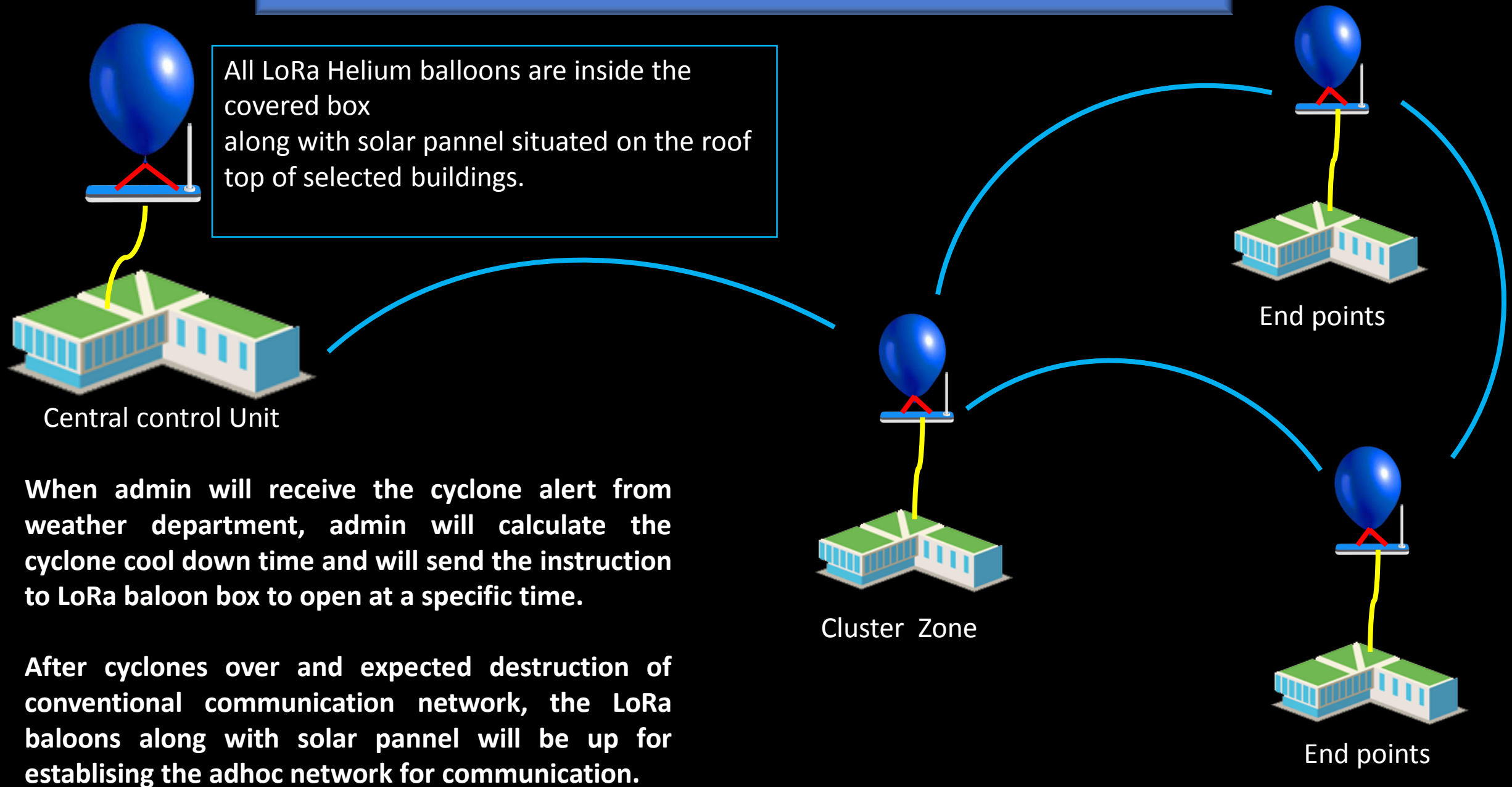


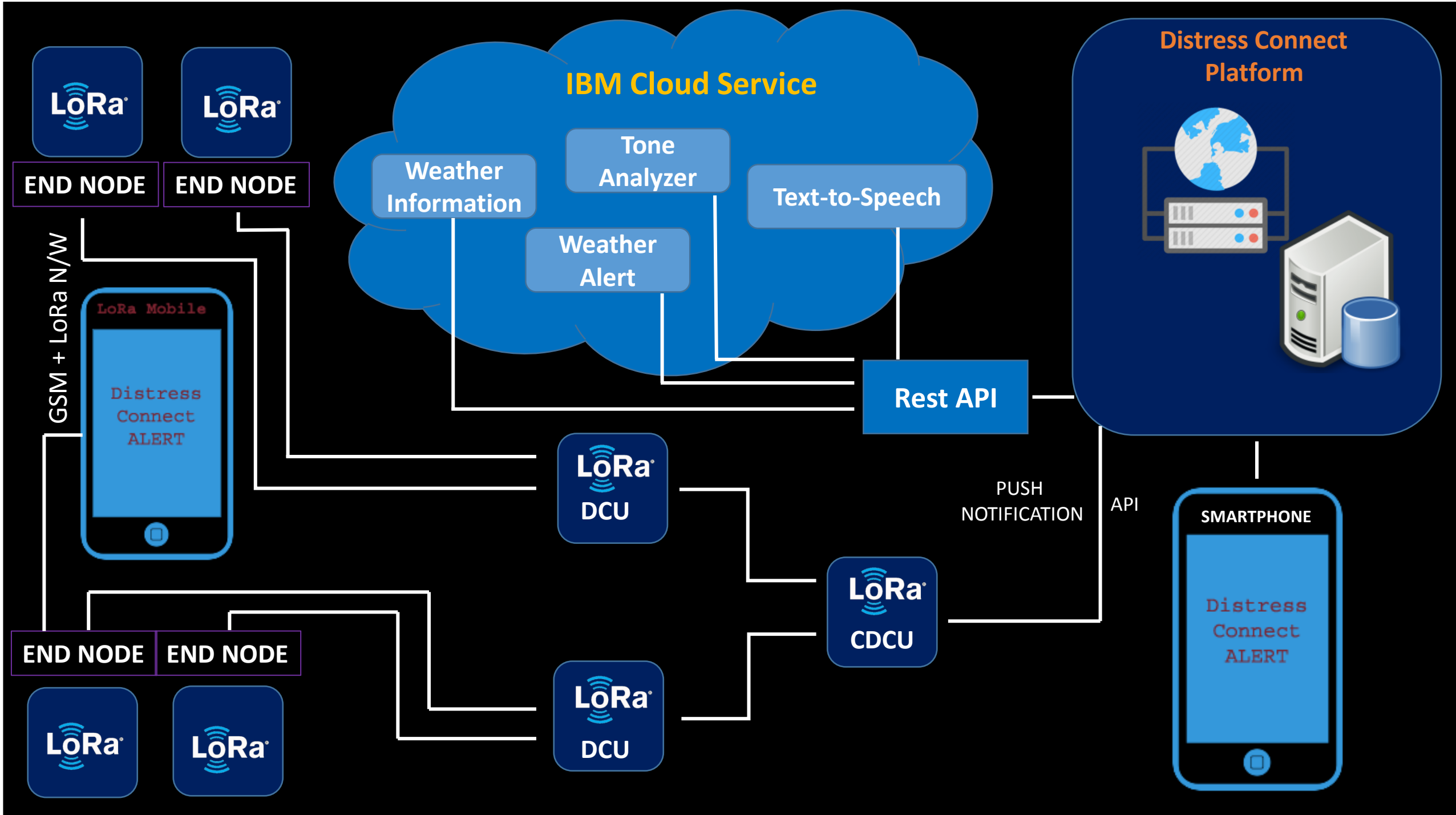
## Scenario - 2 HIGH TIDE AND TSUNAMI ALERT

Providing real time alerts(Tsunami, High tides), weather reports, International boundry approach and other administrative or business specific communication to fishery boats within sea.



## Scenario - 3 CYCLONE MANAGEMENT







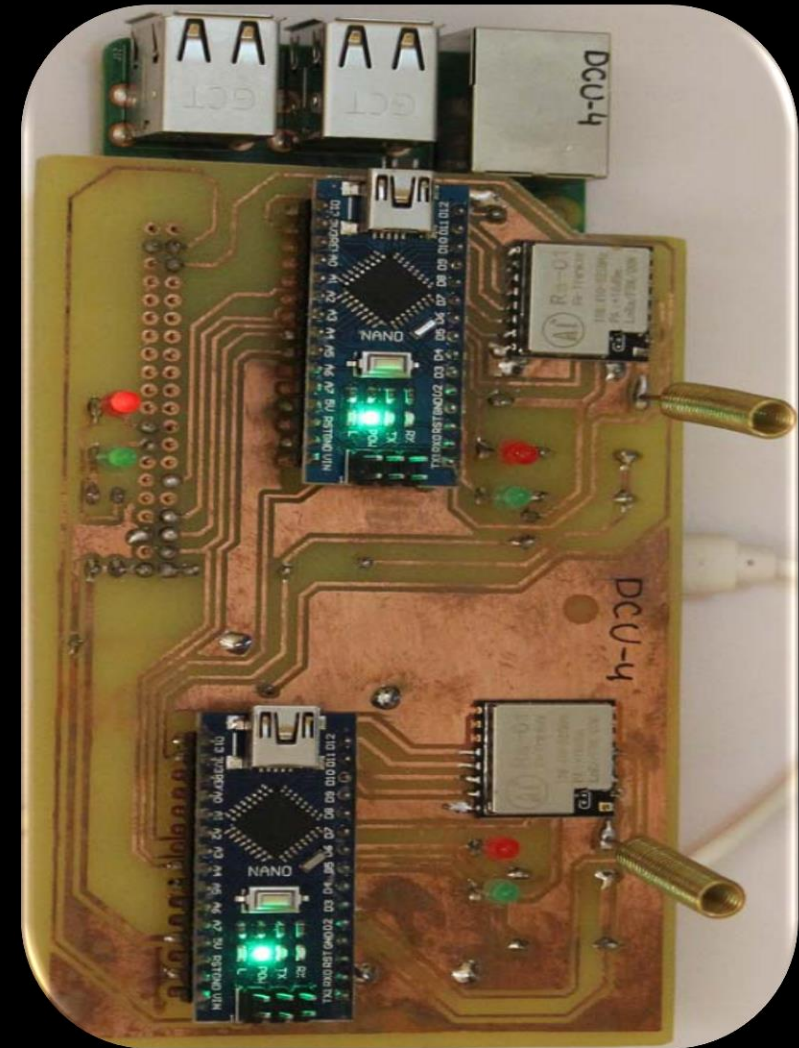
# LoRa COMMUNICATION DEVICES

## Components:

- Specially designed board for Full Duplex communication.
- Raspberry pi for AI training model and speech synthesis
- Arduino for sensors and LoRa backbone communication
- SEMTECH's SX1278 as LoRa module

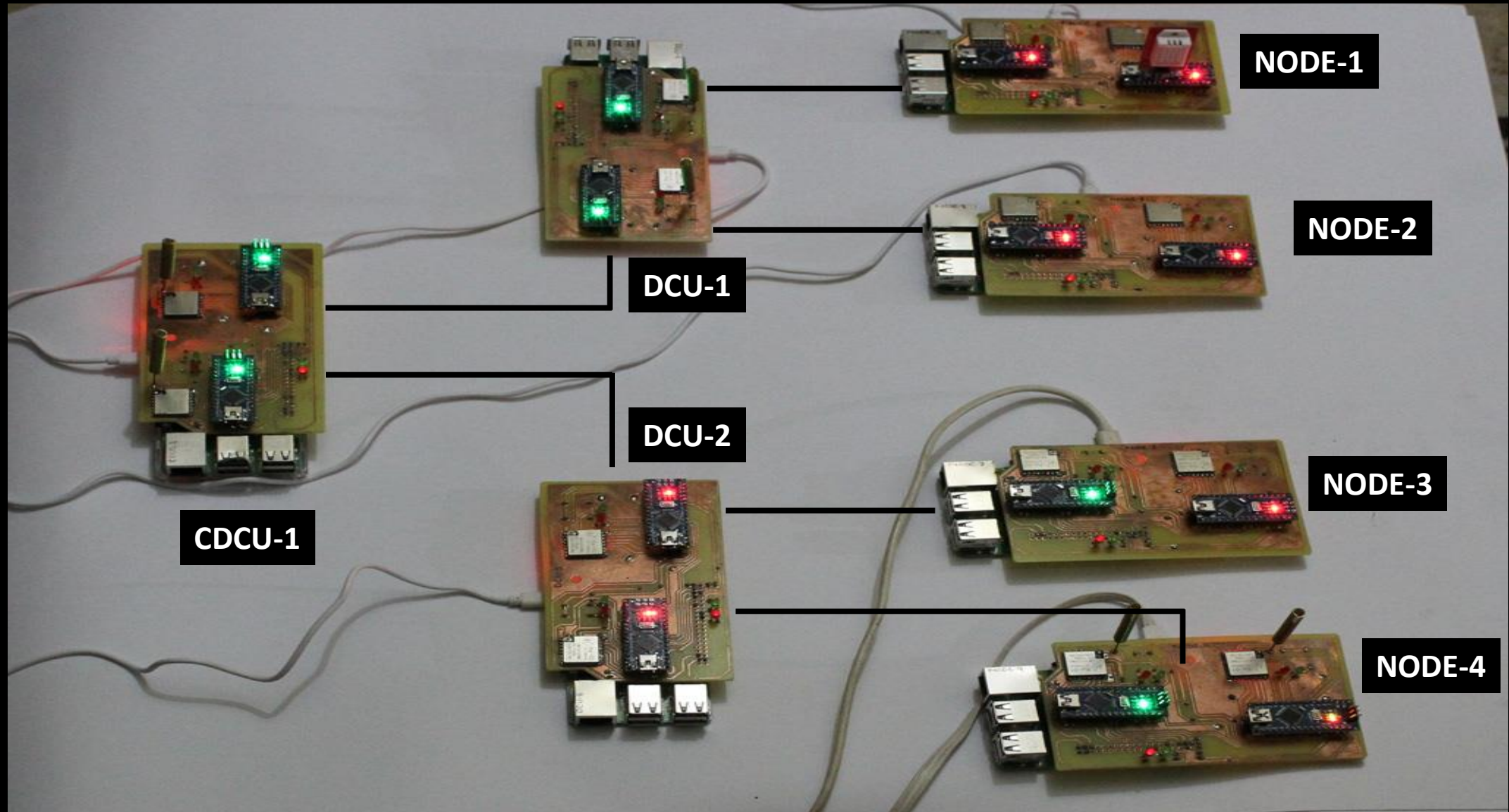
## Function:

- This device is present at each communication point for Physical Layer Communication



A full Duplex LoRa network module

# LoRa COMMUNICATION ARCHITECTURE



# SOFTWARE COMPONENTS OF DISTRESS MANAGEMENT SYSTEM

**USER SITE**

**DATA ENTRY  
PORTAL**

**Admin Portal:** Configuring and managing LoRa nodes , dashboard with various analytics for administrative support.

**User Site:** Public view with weather information and alert

**ADMIN  
PORTAL**

**Mobile App :** Public view with weather information and alert

**MOBILE APP**

**ALERT BILL  
BOARD**

**Alert Billboard:** Auto Alert system for disaster

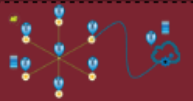
**LoRa Mobile:** Auto alert system for disasters and gateway between LoRa network and existing mobile network.

**LoRa MOBILE**

**Data Entry Portal:** Request administrative support ,provide post disaster information and alert.



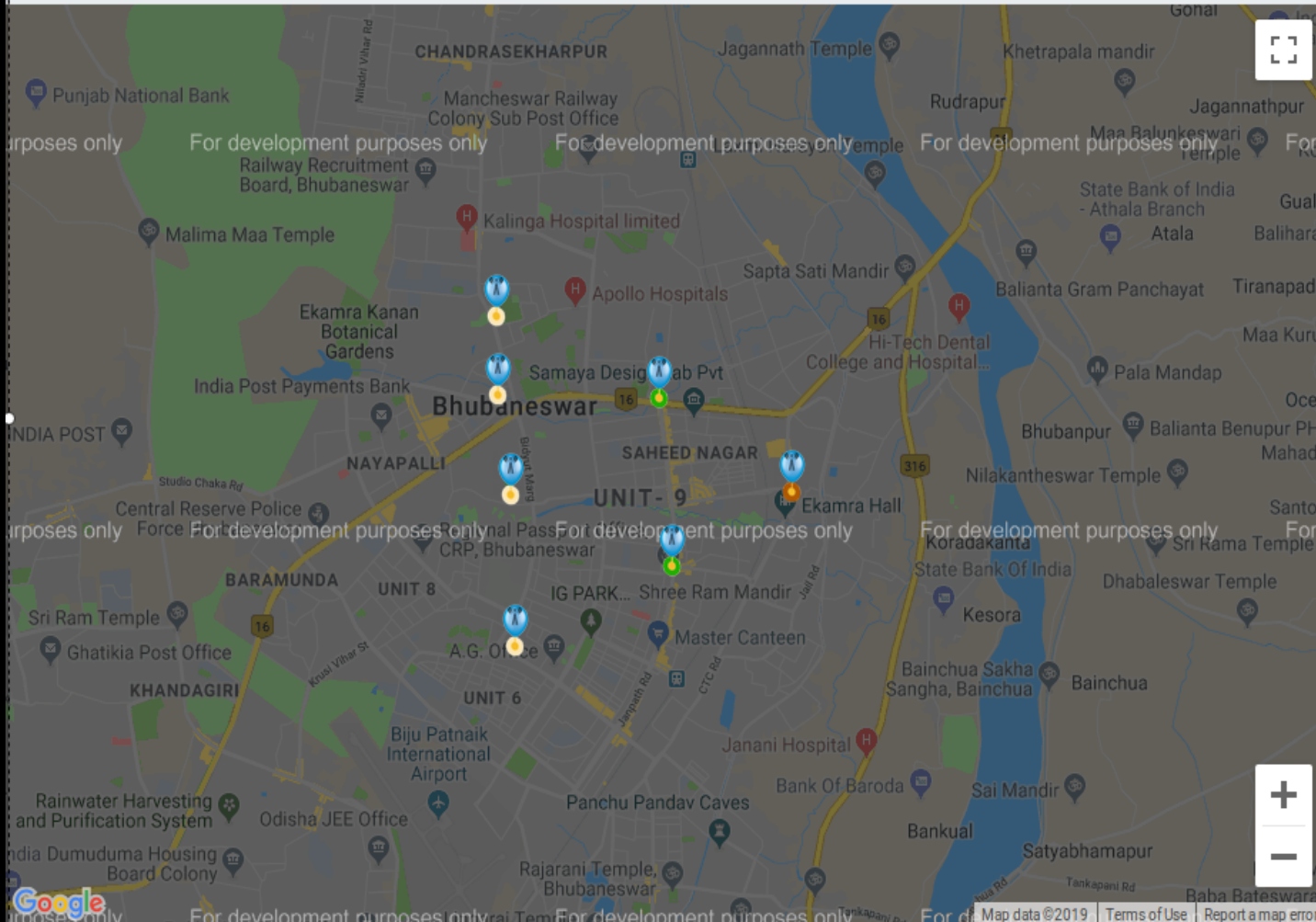
# ADMIN PANEL



DISTRESS CONNECT

Dashboard Users Node Requests Alerts Speech Message Settings admin

Home / Dashboard



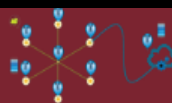
## Post Disaster Impact Information

	Dcu1	Dcu2
How Many People Died	24	5
Human casualties Number	4	
Number of House Damaged	44	13
Is Road Blocked	0	0
Number of Animal Death	66	22
Animal casualties Number	71	25
Number of Electric Pole Destroyed	97	29

## Post Disaster Required Index

	Dcu1	Dcu2
No of Food Packets Required	7	6
Number of Drinking water packets	9	4
Number of Polythenes	11	16
Urgent rescue team required	0	0
Number of People need to rescued from location - Need Airlift	27	22
Please Send NDRF Personal (Number)	35	26

# ADMIN PANEL



DISTRESS CONNECT

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[Home](#) / [Manage Users](#)

## Users

[+ Add User](#)

Show  entries

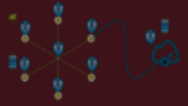
Search:

#	Full Name	Email	Phone	Role	Latitude	Longitude	pincode	Status	Sensor Data	
1	Node4	node4@distress.com	9349939313	node	20.269229	85.824577	763632	Active	<a href="#">View</a>	⋮
2	Node3	node3@distress.com	9349939312	node	20.285430	85.824008	763632	Active	<a href="#">View</a>	⋮
3	Node2	node2@distress.com	9349939311	node	20.295959	85.822439	763631	Active	<a href="#">View</a>	⋮
4	Node1	node1@distress.com	9349939310	node	20.304439	85.822216	763631	Active	<a href="#">View</a>	⋮
5	Dcu2	dcu2@distress.com	9349939388	dcu	20.277876	85.843403	763631	Active	<a href="#">View</a>	⋮
6	Dcu1	dcu1@distress.com	9349939391	dcu	20.295636	85.841874	763631	Active	<a href="#">View</a>	⋮
7	Cdcu	cdc1@distress.com	9349939399	cdc	20.285743	85.857872	763635	Active	<a href="#">View</a>	⋮

Showing 1 to 7 of 7 entries

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# ADMIN PANEL



DISTRESS CONNECT

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Home / Manage Users

## Users

Show 10 entries

#	Full Name	Email	Phone	pincode	Status	Sensor Data
1	Node4	node4@distress.com	9349939399	763632	Active	View
2	Node3	node3@distress.com	9349939399	763632	Active	View
3	Node2	node2@distress.com	9349939399	763631	Active	View
4	Node1	node1@distress.com	9349939399	763631	Active	View
5	Dcu2	dcu2@distress.com	9349939399	763631	Active	View
6	Dcu1	dcu1@distress.com	9349939391	763631	Active	View
7	Cdcu	cdc1@distress.com	9349939399	763635	Active	View

Showing 1 to 7 of 7 entries

Previous 1 Next

### Sensor Data

Temperature	Humidity	Recorded On
29.70	85.30	2019-07-29 18:16:11
29.70	84.70	2019-07-29 18:16:00
29.70	85.20	2019-07-29 18:10:24
29.70	85.20	2019-07-29 18:10:14
29.70	85.20	2019-07-29 18:10:05
29.70	85.20	2019-07-29 18:09:54
29.70	85.10	2019-07-29 18:09:35
29.70	85.10	2019-07-29 18:09:25
29.70	85.00	2019-07-29 18:09:15
29.70	85.00	2019-07-29 18:09:04



# ADMIN PANEL



DISTRESS CONNECT

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[Home](#) / [Node Request](#)

## Node Request

Cdcu \*

Select

Dcu \*

Select

Node \*

Disaster Type \*

Select

Disaster Message \*

Select

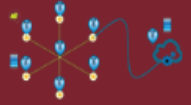
Reset

Send Request

## Node Request - Response Statistics

Disaster Type	Node (End Point)	No of Request
Earthquake/Tsunami	Node1	23
Earthquake/Tsunami	Node2	1
Earthquake/Tsunami	Node3	1
Earthquake/Tsunami	Node4	1
Cyclone/Hurricane/Tornado	Node1	11
Cyclone/Hurricane/Tornado	Node3	2
Cyclone/Hurricane/Tornado	Node4	2

# ADMIN PANEL



DISTRESS CONNECT

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[Home](#) / [Node Request](#)

## Send Alerts

Cdcu \*

Select

Dcu \*

Select

Node \*

Alert Type \*

Select

Alert Message \*

Select

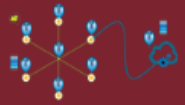
Reset

Send Alert

## Alert Sent Statistics (LoRa End point)

Alert Type	Node (End Point)	No of Alert
Earthquake/Tsunami	Node1	8
Earthquake/Tsunami	Node2	2
Cyclone/Hurricane/Tornado	Node1	3
Cyclone/Hurricane/Tornado	Node4	1
Flood/GLOF/Cloud Burst	Node1	3
Flood/GLOF/Cloud Burst	Node2	2
Thunder	Node3	1
Thunder	Node4	1
High Tide	Node1	1
High Tide	Node2	1
Other Alerts	Node3	1

# ADMIN PANEL



DISTRESS CONNECT

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[Home](#) / [All Speech Messages](#)

## Speech Messages

Show 10 entries

Search:

#	Node	Message	Play	Tone Analyzer	Posted On
1	NODE-6	Severe Flood entire village washed out, send 10 NDRF Team soon.	<button>Play</button>	<u>Tone</u> Confident	2019-07-29 19:15:50
2	NODE-6	Hurricane alert	<button>Play</button>	<u>Tone</u>	2019-07-29 19:15:38
3	NODE-6	Hurricane alert	<button>Play</button>	<u>Tone</u>	2019-07-29 19:15:13
4	NODE-6	Hurricane alert	<button>Play</button>	<u>Tone</u>	2019-07-29 19:13:54
5	NODE-6	Hurricane alert	<button>Play</button>	<u>Tone</u>	2019-07-29 19:13:21
6	NODE-6	Flood will come	<button>Play</button>	<u>Tone</u>	2019-07-29 18:03:09
7	NODE-5	Earthquake Started	<button>Play</button>	<u>Tone</u>	2019-07-28 15:17:16
8	NODE-7	Cyclone Will come	<button>Play</button>	<u>Tone</u>	2019-07-28 15:16:44

Showing 1 to 8 of 8 entries

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# ADMIN PANEL



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[Home](#) / [User Role Matrix](#)

Manage Role Matrix

PAGE

MENU

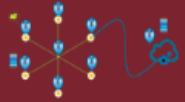
MODULE	OPERATION	ADMIN	NODE	DCU	CDCU
MENU	DASHBOARD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MENU	USER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	ROLE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	SETTINGS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	BACKUP_DATA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	CONFIGURATION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	GET_NODE_STATUS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	SEND_ALERTS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MENU	SPEECH_MESSAGE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ROLE

USER

Save

# ADMIN PANEL



DISTRESS CONNECT

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[Home](#) / [Configuration](#)

Disaster Type

Disaster Message

Alert Type

Alert Message

## All Disaster Type

Show 10 entries

Search:

#	Disaster Type	Action
1	Earthquake/Tsunami	<a href="#">Edit</a>
2	Cyclone/Hurricane/Tornado	<a href="#">Edit</a>
3	Flood/GLOF/Cloud Burst	<a href="#">Edit</a>
4	Thunder	<a href="#">Edit</a>
5	High Tide	<a href="#">Edit</a>

Showing 1 to 5 of 5 entries

[Previous](#) [1](#) [Next](#)

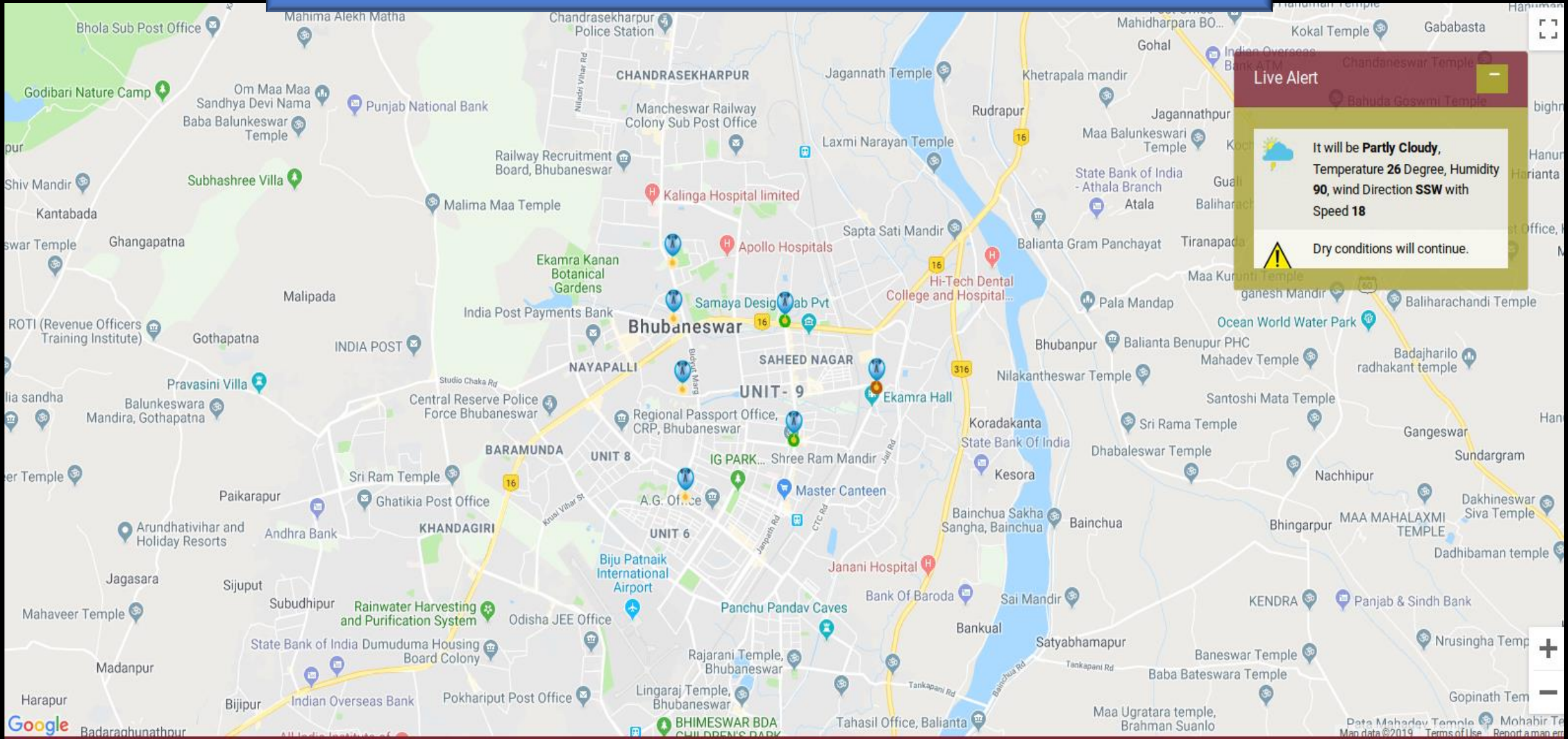
## Add Disaster Type

Type \*

[Reset](#)

[Add](#)

# USER SITE



DISTRESS CONNECT

[Home](#) [Login](#)

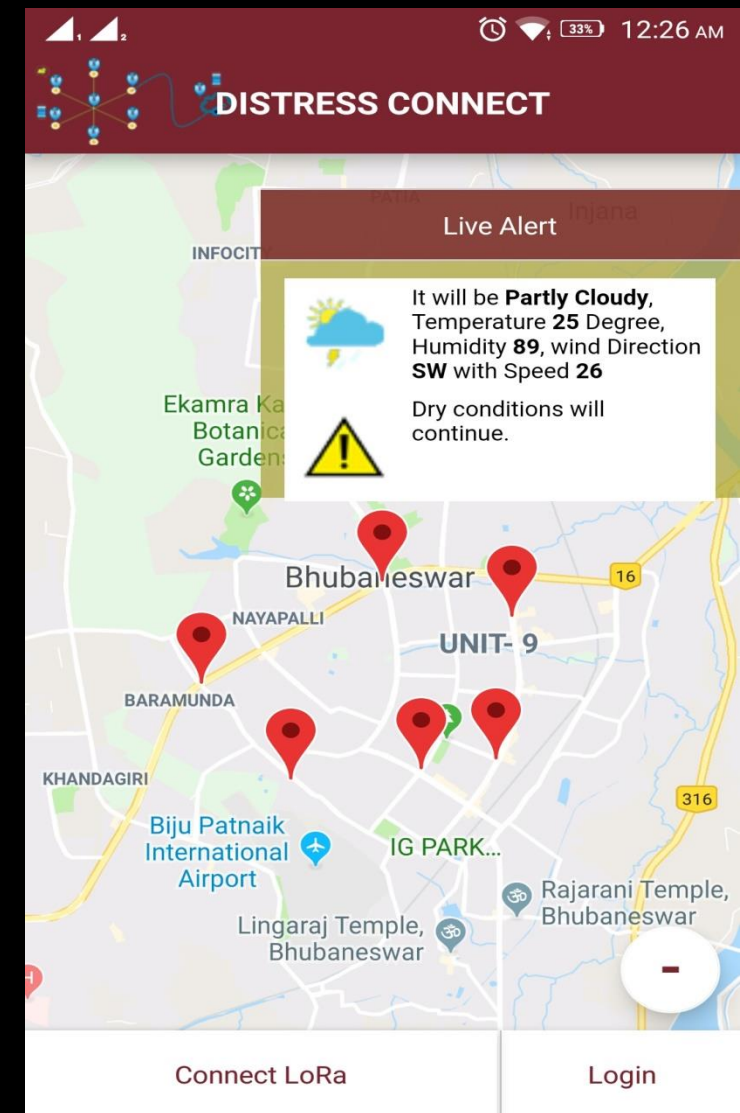
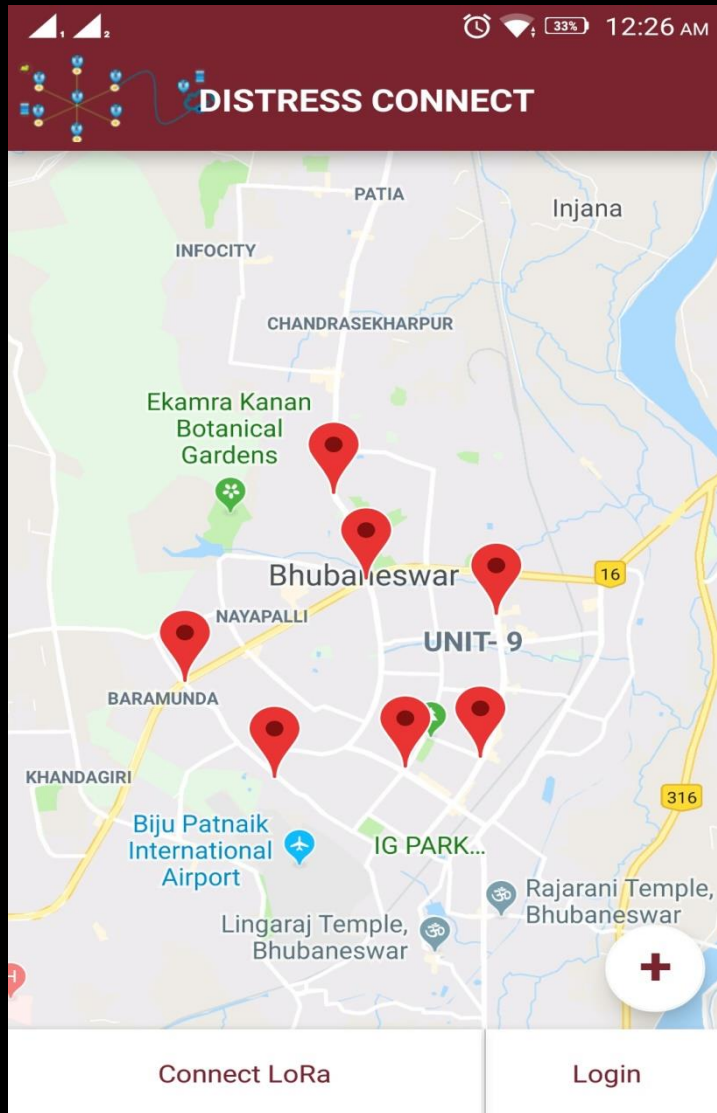


# LoRa MOBILE



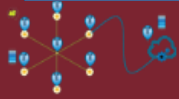
A dedicated LoRa mobile loaded with Bluetooth, Wifi, GSM along with connect to LoRa network facility

# MOBILE APPLICATION



Android application for public view of live weather information and connect to LoRa option to connect LoRa WAN.

# DATA ENTRY PORTAL



DISTRESS CONNECT

[Home](#)

[Send Message](#)

## Information

How Many People Died

0

Human casulaities Number

0

Number of House Damaged

0

Is Road Blocked

NO

Number of Animal Death

0

Animal casulaities Number

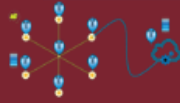
0

Number of Electric Pole Destroyed

0

SEND

# DATA ENTRY PORTAL



DISTRESS CONNECT

[Home](#)

[Send Message](#)

## Support

No of Food Packets Required

0

Number of Drinking water packets

0

Number of Polythenes

0

Urgent rescue team required

NO

Number of People need to rescued from location - Need Airlift

0

Please Send NDRF Personale (Number)

0

SEND



# DATA ENTRY PORTAL



DISTRESS CONNECT

[Home](#)

[Send Message](#)

## Send Message

Message

SEND

## ALERT BILL BOARD

Cyclone will hit in your area. Move to safe place

THANK YOU  
TEAM DISTRESS CONNECT