SMART INDIA HACKATHON 2024



- Problem Statement ID SIH1527
- Problem Statement Title Student Innovation
- Theme- Disaster Management
- PS Category- Hardware
- Team ID-
- <u>Team Name-</u> Team LIFELINE





LIFE LINE



IDEA / SOLUTION:

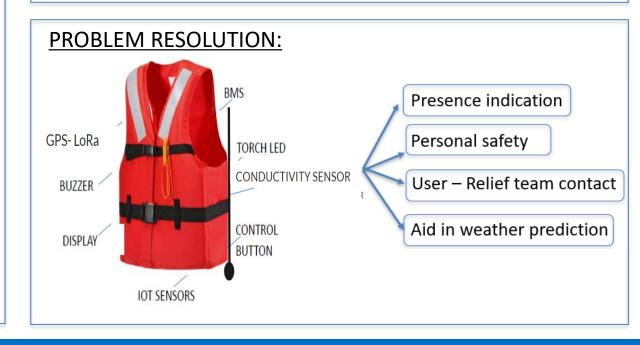
We propose a unique **life-saving** hardware device engineered to aid every citizen during **flood relief** operations. Our device, "**LIFE-LINE**". is a rescue-gear to **mitigate the issues** faced by people in the **disaster hit regions of the nation**.

Our device consists of:

- All inclusive Electronics gear to equip and upgrade existing life jackets
- GPS technology to alert the stranded citizen's location to the rescue or NDRF team
- LoRa protocol for establishing reliable communication without dependency on cellular networks, WiFi, Bluetooth..
- Rechargeable battery power for usage in hazardous conditions
- Back-end ML model to predict the immediate weather using real time data from IOT sensors and notify the user

UNIQUE VALUE PROPOSITION(UVP):

- Efficient search and rescue by upgrading available jackets (more features in existing simple jacket)
- Functions with full efficiency without internet
- Two way benefit Common People and Rescuer
- Saves more human lives





TECHNICAL APPROACH





Microcontroller

ESP32 advanced board for all operations





Communication

GPS and LoRa protocol module for user to "relief team" data transfer regarding **location** so that they come to **save** victims





Alert system

Buzzer for alerting (sound) the user of current in water and OLED display for notifications of the warning from IMD based on weather prediction if they need to move or find shelter



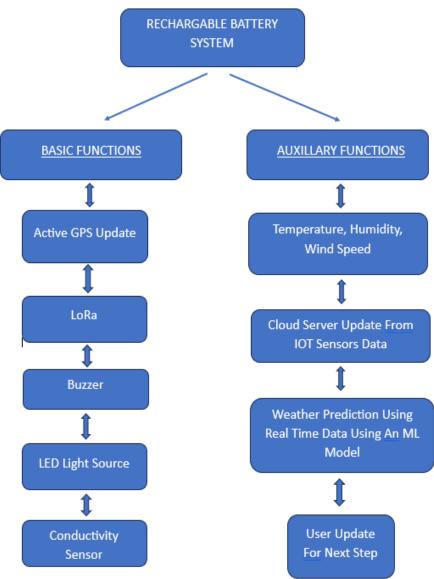


Conductivity sensor to sense electricity in water, DHT11 sensor to send live environmental data to IMD via LoRa protocol and BMP180 sensor to sense the pressure



Coding

Machine learning model training and prediction of rain from live data received from sensors from each person for the Backend development





FEASIBILITY AND VIABILITY



FEASIBILITY:

• Building on the existing material and adding extra features to it helps in saving the resources and reusing government assets

Reuse

 Sensors used are readily available in the market and the design and technology used are userfriendly

POTENTIAL RISKS / CHALLENGES AND STRATEGIES TO OVERCOME :

Ensuring IoT sensors remain waterproof while Maintaining environmental data accuracy for weather forecasting

Rubber gasket for creating watertight seals for enclosure. For IoT sensors, silicone conformal coating and water proof membranes can be used to allow interaction with environment and shield from water

GPS accuracy may be compromised by signal reflections from surrounding surfaces and indoor conditions

Specialized external antenna can be used to improve the sensitivity of the GPS, **increase it's gain** and maximize the signal strength, even in closed spaces.

Weight balancing

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Placing of components appropriately



IMPACT AND BENEFITS



BENEFITS AND IMPACT CREATED:

- One strategy for complete emergency preparedness
- Reliable and safe transportation and rescue in flood
- Provides individuals with greater confidence and security during floods, reducing panic and anxiety
- India being a heavy flood prone country, our solution will be an evergreen need
- The target audience for the device is the general public afflicted by floods. This broad market appeal creates potential for increased sales and profitability.

"Our mission aligns directly with **SDG 11.5**, which focuses on reducing casualties caused by natural disasters"









RESEARCH AND REFERENCES



- https://nidm.gov.in/PDF/TrgReports/2023/June/Report_23J une2023cg.pdf
- https://www.ndtv.com/south/vijayawada-floods-ajit-singhnagar-flooding-dramatic-video-of-vijayawada-streetflooding-4-feet-of-water-in-3-hours-6533985
- https://citizenmatters.in/chennai-floods-real-estatewetland-encroachment-buildings-solutions/

