



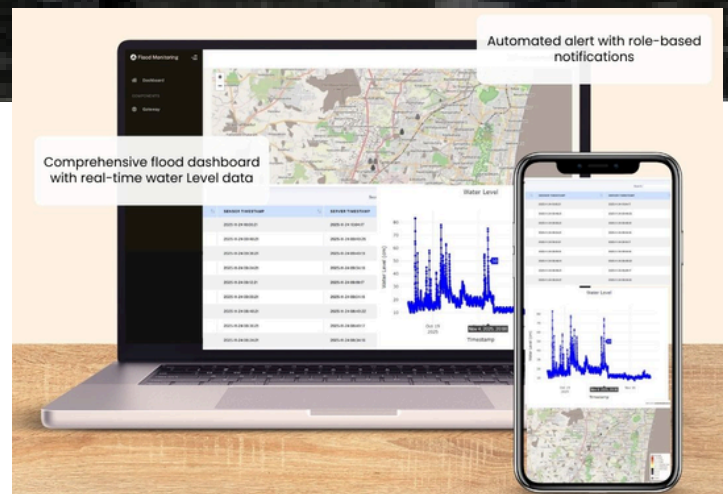
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CASE STUDY

Flood Early Warning System

PROBLEM STATEMENT

Flood early warning systems are critical for flood-prone regions across India. Chennai 2015 flood was considered as the disaster event resulting in over 400 deaths, severe infrastructure damage, and an economic loss exceeding ₹1,000 billion. During floods, data regarding water level and inundation at multiple sites in urban areas is a challenge as the traditional data collection methods fail during disasters. These events highlight the urgent need for real-time, automated, and affordable flood monitoring solutions capable of operating reliably even in remote or hard-to-reach areas. We have developed an IoT solution to provide a robust Flood Early Warning System using non-contact water-level sensors and RF-based communication, designed specifically for continuous urban monitoring and timely alert generation.



Example Case Study

In early 2023, the Gorakhpur Municipal Corporation partnered with Canarys Automations

Impact

- Response times dropped from 10-12 hours to under 1.5-2 hours.
- Pump downtime decreased by over 60%.
- Pre-monsoon drain cleaning covered over 95% of the targeted areas.
- Flood forecast accuracy remained above 80% for 24-hour predictions.
- Over 250 citizen complaints were recorded; more than 70% resolved within hours.
- Overall system efficiency improved by 65%, boosting municipal response capacity.



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SOLUTION

Our IoT Solution leverages **GSM/LoRa communication** to provide early warning When Flood is detected .



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Flood Early Warning System



- ▶ Canal real-time water monitoring
- ▶ GSM - LoRa Communication
- ▶ Role-Based Access and Alerts


Supports GSM and
LoRa communication



Cloud Server



Web/ Mobile Dashboard

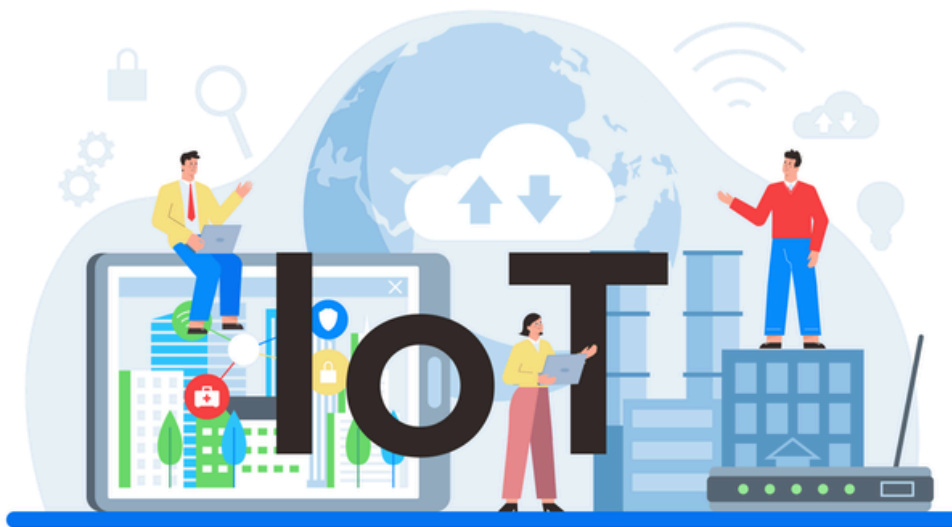
BENEFITS

- Technology enables effective monitoring of large dams, rivers and flood prone catchments
- Automated alerts and reports are triggered to support rapid response
- Early warnings of rising water levels, significantly lowers the risk of sudden flood events.
- Reliable real-time data empowers civic bodies and disaster management authorities to act faster, optimize resource deployment, and improve emergency preparedness.

CHALLENGES

In Community Driven Deployment

1. **Finding good installation spots** : LoRa gateways need height for better coverage, but getting access to rooftops or high structures especially in crowded or flood-prone areas is tough.
2. **Power issues** : Many sensors sit near rivers, canals, or spillways where there's no reliable grid power.
3. **Signal problems in bad weather** : Heavy rain and high humidity during floods can weaken RF signals and slow down real-time updates.
4. **Line-of-sight limitations** : Buildings and plant growth obstacles in urban areas block RF coverage, and permission for rooftop placement is often hard to get.
5. Permission for Device Placement has strong community dependency.
6. **Hardware damage** : Sensors getting hit by debris or submerged during floods.
7. Sensors Displacement due to Animals and birds
8. Maintenance of device during bad weather due to the above



This project was done in partnership with IIT-Madras and Jivass Technologies