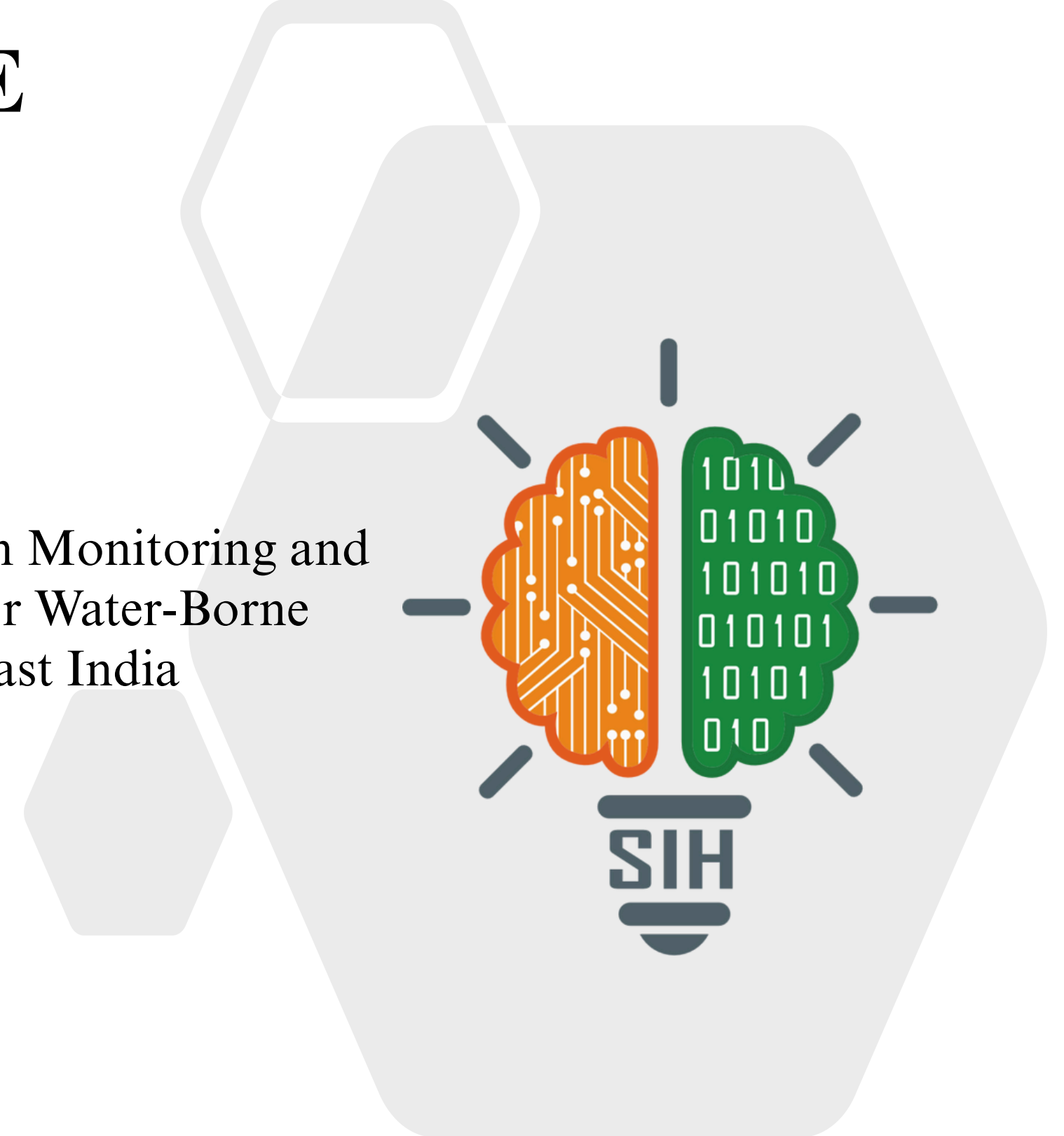


# VADODARA HACKATHON 6.0

## TITLE PAGE

- **Problem Statement ID –** SIK25001
- **Problem Statement Title-** Smart Community Health Monitoring and Early Warning System for Water-Borne Diseases in Rural Northeast India
- **Theme-**
- **PS Category- Software/Hardware**
- **Team ID-** VH6\_PIT\_105
- **Team Name - (Registered on portal)**



# IDEA TITLE

## • Proposed Solution

- **Offline-first mobile & IVR/SMS system for villages to report symptoms and water quality without requiring constant internet.**
- **QR-tagged water sources + AI-powered test strip scanning for quick, low-cost detection of contamination.**
- **Real-time outbreak mapping & early warnings for health workers and organizations to respond faster.**
- **Community-driven participation ensures scalability, inclusivity, and stronger local adoption.**
- **Low-cost, high-impact model that prevents late detection, reduces disease spread, and supports sustainable rural health monitoring**

# TECHNICAL APPROACH

## Technologies to be used :

### 1. Data Collection

IoT sensors & manual health reports Water testing data from field workers

### 2. Data Transmission

IoT devices → Cloud (via Wi-Fi/4G/LoRa) Mobile app for manual entry

### 3. Data Processing & Storage

Cloud-based database (AWS/Firebase/MySQL) Cleaning & preprocessing (Python, Pandas)

### 4. Analytics & Prediction

ML models detect anomalies in water quality. Predict risk of outbreaks (cholera, diarrhea, etc.)

### 5. Alerts & Early Warning System

Automated SMS/Push notifications to communities & health orgs. Dashboard for government/NGOs

### 6. Community Action & Feedback

Health workers respond faster. Residents report issues via app

# FEASIBILITY AND VIABILITY

## Feasibility Analysis

**High Need & Relevance:** Over 37.7 million Indians are affected by waterborne diseases annually, with 1.5 million deaths globally linked to unsafe water. Rural Northeast India faces poor water infrastructure and frequent outbreaks.

**Technical Feasibility:** IoT sensors, mobile apps, and AI-based analytics are readily available, scalable, and low-cost compared to conventional healthcare infrastructure.

**Operational Feasibility:** Community-level training for health workers and NGOs ensures adoption. Government health programs (e.g., Jal Jeevan Mission) can support integration.

## Potential Challenges & Risks

1. Data Accuracy – Sensor malfunction or unreliable disease reporting.
2. Connectivity Issues – Limited internet in remote villages.
3. Community Resistance – Low awareness or reluctance to adopt new tech.
4. Maintenance Costs – Long-term sustainability of sensors and app.
5. Privacy Concerns – Handling of sensitive health data

# IMPACT AND BENEFITS

## Potential Impact on the Target Audience

The solution will empower rural communities by providing timely alerts about water contamination and potential disease outbreaks. This will help families, health workers, and local authorities take preventive measures early, reducing illness and saving lives. It also builds trust in technology for community well-being.

## Benefits of the Solution

- Social: Improves overall community health, reduces suffering, and raises awareness about safe water practices.
- Economic: Lowers healthcare costs by preventing large-scale outbreaks and minimizes work/school days lost due to illness.
- Environmental: Promotes cleaner water usage, encourages better sanitation practices, and supports sustainable development in rural areas.

# RESEARCH AND REFERENCES

**WHO** – Water Sanitation and Health: <https://www.who.int/health-topics/water-sanitation-and-hygiene>

**UNICEF** – Water, Sanitation, and Hygiene (WASH): <https://www.unicef.org/wash>

**Ministry of Jal Shakti, Government of India:** <https://jalshakti-ddws.gov.in>

- National Health Portal (India) – Waterborne Diseases: <https://www.nhp.gov.in>
- Research Paper: “Waterborne diseases in India: current scenario and future” – ScienceDirect
- India State-Level Disease Burden Report (Lancet, ICMR)