Project Proposal

Smart Community Health Monitoring and Early Warning System for Water-Borne Diseases in Rural Northeast India

Software Solution Name

Community Health Watch – A software platform for early detection of water-borne disease risks.

1. What It Does

Collects Data

Villagers/ASHA workers report symptoms (like diarrhea, vomiting, fever) through:
- A mobile app (with local language support, works offline).
- SMS or IVR (for people without smartphones).

Monitors Data

A dashboard (web app) for health officials shows:
- Case counts per village.
- Maps with hotspots (villages reporting unusual illness).
- Trends and charts.

Detects Risks

Software checks for sudden spikes in symptoms or water complaints.
Uses simple rules or machine learning to flag unusual patterns.

Sends Alerts

Sends SMS/WhatsApp/Push notifications to health officers and local leaders when a possible outbreak is detected.
Suggests preventive action (like “Boil water before drinking”).

2. Required Tech Stack

Frontend:

- React (Web Dashboard)
- React Native or Flutter (Mobile App, offline-first)

Backend:

- FastAPI (Python) or Node.js (Express/NestJS)

Database:

- PostgreSQL + PostGIS (geospatial support)
- TimescaleDB (optional, for time-series symptom data)

Analytics & ML:

- Python libraries (Pandas, Scikit-learn, Prophet for forecasting)

Notifications:

- Twilio/Exotel (SMS & IVR)
- Firebase (Push notifications)

Mapping & Visualization:

- Leaflet.js or Mapbox (interactive maps)
- Grafana (optional, monitoring dashboards)

3. Benefits of the Software Solution

- Early detection of water-borne disease outbreaks.
- Low-cost and scalable: software-first design without dependency on expensive hardware.
- Inclusive: SMS/IVR for non-smartphone users and offline-first mobile app.
- Provides real-time data visualization with maps and trends.
- Empowers local health workers and villagers to participate in disease prevention.

4. Future Extensions

- Integration with IoT-based water quality sensors.
- Link with state/national health department databases.
- AI-driven outbreak forecasting using weather, water quality, and health data.