🛰️ ECO-TECH HACKATHON 2026 • ENVIRONMENT WATCH: BUET

NodiWatch

AI-Powered Satellite Surveillance for Bangladesh's Rivers — **Catching Polluters & Land Grabbers from Space**

🌊 **Protecting Rivers with Intelligence**

Team AlphaVerse • February 2026

① PROBLEM STATEMENT

Bangladesh's Rivers Are Under Siege

2,500+
Factories near Dhaka river system

40%
Dhaka riverbanks lost to encroachment

81
Rivers dried up or extinct (RDRC 2025)

60×
Chromium levels exceed WHO limits in Buriganga

STAKEHOLDERS

Who Needs This Solved?

② PROPOSED SOLUTION

Introducing NodiWatch

An AI-powered satellite surveillance system that transforms **10 years of free satellite imagery** into actionable enforcement intelligence.

🎯 **Pollution Fingerprinting**

Classify polluter type — textile dye, tannery, thermal — via multispectral indices (NDTI, NDWI, thermal bands)

📐 **Encroachment Detection**

Compare 2016 vs 2026 water boundaries using CNN segmentation to detect illegal land filling

📊 **Probabilistic Attribution**

Rank nearby factories by likelihood using Bayesian model + OpenStreetMap geolocation

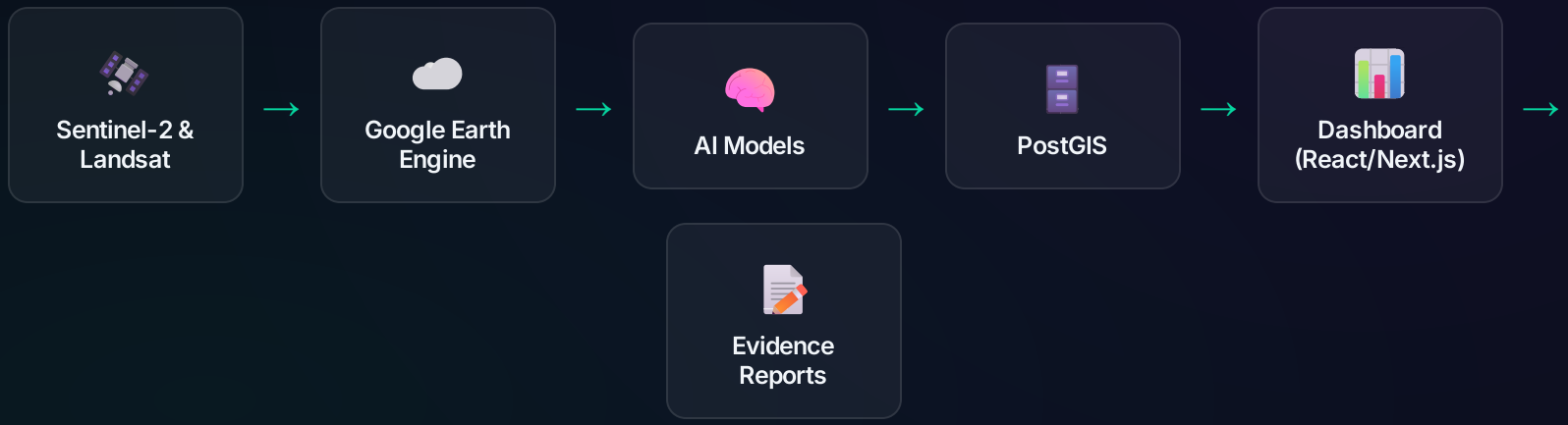
🚨 **Real-time Alerts**

Automated notifications when pollution spikes or encroachment exceeds 10% of baseline width

River pollution visible from satellite — NodiWatch identifies the source

③ AI / MODERN TECHNOLOGY

Three-Layer AI Intelligence



④ FEATURES & APPLICABILITY

Dual Heatmap Command Center

⑤ MARKET OPPORTUNITY

A Massive, Untapped Market

1,400+
Rivers to monitor nationwide

2,500+
Industrial units on Dhaka rivers

₹1.2T
Bangladesh textile export industry

0
Automated monitoring systems today

⑥ BUSINESS MODEL

Sustainable Revenue Streams

TIER 1 — B2G

Government SaaS License

৳ 15 Lakh/yr

Annual subscription for DoE & NRCC. Full dashboard, unlimited evidence reports, automated alerts, API access. Covers regional river monitoring.

TIER 2 — B2B

Green Banking API

Pay-per-query

Banks query NodiWatch API during loan processing. Returns factory pollution risk score + historical violation data. Automates Bangladesh Bank's Green Banking requirements.

TIER 3 — GLOBAL

Data Licensing & Research

Custom Pricing

Licensed access for international organizations (UNDP, World Bank, ADB) and research institutions studying South Asian river ecosystems.

⑦ ENVIRONMENTAL & SOCIAL IMPACT

Transforming River Protection

Dual Enforcement

One platform catches both polluters **and** land grabbers simultaneously — no duplicate systems, no wasted resources

Court-Ready Evidence

10-year satellite comparison creates legal-grade proof of river narrowing — transforming prosecution with irrefutable spatial data

Urban Flood Prevention

Identifying encroached river sections guides targeted restoration — directly protecting 9M+ Dhaka residents from monsoon flooding

Smart Enforcement

AI risk scores direct inspectors to **highest-risk factories first** — saving time, reducing danger, maximizing impact per inspection

1,400+
Rivers can be monitored

10yr
Historical evidence depth

24/7
Automated surveillance

10m
Spatial resolution

⑧ PROTOTYPE & ROADMAP

From Concept to Impact

Current Stage: **Early Prototype — GEE Pipeline Validated**

Phase 1 — Q1'26
- GEE data pipeline
- CNN water segmentation
- Baseline river boundary maps

Phase 2 — Q2'26
- Spectral fingerprinting
- Random Forest classifier
- Pollution type classification

Phase 3 — Q3'26
- React/Next.js dashboard
- Dual heatmap visualization
- Automated alert system

Phase 4 — Q4'26
- DoE/NRCC pilot program
- Green Banking API launch
- Citizen validation module

⑨ TEAM ALPHAVERSE

The Team Behind NodiWatch

M1

Member 1

AI / ML Lead

CNN & Random Forest models, spectral analysis, TensorFlow pipeline

M2

Member 2

Full-Stack Developer

React/Next.js dashboard, PostGIS integration, Green Banking API

M3

Member 3

GIS & Data Lead

Google Earth Engine, satellite data processing, geospatial analysis

Let's Protect Our Rivers — From Space

With NodiWatch, we aren't just watching the rivers — **we're giving them a voice in court.**

🛰️ Thank You — Innovate for Green