

# Near-Real Time Farm-Level Weather and Soil Information for Precision Agriculture Using Low-Cost IoT Sensors and Geospatial Technologies.

# Agriculture

**Pilot District**  
Varanasi, Uttar Pradesh

**Geospatial Innovation Accelerator**  
FIRST, IIT Kanpur

## Technology Summary

Our technology is an integrated IoT-UAV-Satellite farm intelligence platform that delivers real-time soil, weather, and crop insights for precision agriculture. It combines low-cost IoT sensors, drone-based multispectral and thermal data, and satellite imagery into a unified WebGIS dashboard for actionable decision-making. Using LoRa connectivity and solar-powered units, the system ensures seamless operation in remote farms. Through AI-driven analytics, it enables irrigation planning, yield forecasting, and crop health monitoring that makes agriculture more efficient, resilient, and data-driven.

## Technology Readiness Level:

# 6

### Value Proposition:

Our technology integrates IoT, drone, and satellite based datasets into a single platform delivering real-time farm insights. It enables smarter irrigation, soil nutrients, yield forecasting, and crop-stress monitoring. Making agriculture efficient, connected, and climate-resilient.

### Market Potential / Deployment Plan

Our technology meets the growing need for real-time agricultural intelligence across India's AgriTech market, serving farmers, agri-input firms, government bodies, and climate agencies. Initial pilots in Varanasi will integrate IoT, UAV, and satellite data, followed by scaling through state agriculture missions, KVKs, and FPOs. Its low-cost, modular design enables nationwide replication and easy integration with existing geospatial systems.

### Applications

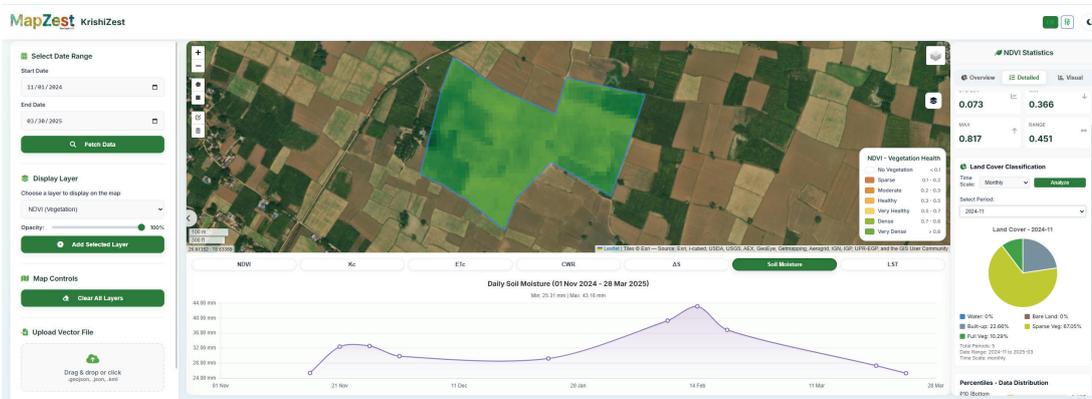
Used for precision farming, irrigation planning, soil nutrients, yield forecasting, and crop stress detection. Supports climate-resilient agriculture and integration with government agri missions.

### Environmental / Social Impact

Promotes climate-smart farming by reducing resource waste and improving soil health. Empowers small farmers with real-time data for better productivity and resilience.

### Contribution to Sustainable Development Goals (SDGs):

**SDG 2, 12 & 13**



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