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GEO-INTEL LAB

SRAJANAI

Agriculture

Pilot District
Varanasi, Uttar Pradesh

Geospatial Innovation Accelerator
FIRST, IIT Kanpur

Technology Summary

The solution integrates Continuously Operating Reference Stations (CORS) with geospatial analytics to deliver sub-meter accuracy in agricultural boundary mapping. Using CORS-corrected GPS data and Sentinel-2 satellite imagery, SrajanAI generates precise farm and block maps, enabling accurate crop health assessment through indices like NDVI and NDWI. Machine learning models further optimize irrigation, fertilizer, and yield planning.

Technology Readiness Level:
7

Value Proposition

SrajanAI's CORS-enabled geospatial solution delivers unprecedented precision in farm and block boundary mapping, ensuring sub-meter accuracy for agricultural decision-making. By combining high-accuracy positioning with satellite analytics and AI-driven insights, it empowers farmers, cooperatives, and government agencies to optimize irrigation, fertilizer use, and resource planning. The solution also provides geo-verified data for land ownership validation, subsidy distribution, and dispute resolution, bridging the gap between technology and field-level impact. Ultimately, it transforms traditional agriculture into a data-driven, transparent, and scalable ecosystem for sustainable productivity and governance.

Market Potential / Deployment Plan

The solution targets the rapidly growing agritech and precision agriculture market, addressing the demand for accurate geospatial data in land mapping, farm analytics, and resource management. India alone has over 140 million hectares of farmland, while global precision agriculture is projected to exceed USD 20 billion by 2030, offering strong commercialization potential.

Deployment Plan

The project will begin with pilot implementations across selected farm clusters and FPOs, validating sub-meter boundary mapping and data accuracy. Following successful validation, the solution will be scaled regionally through partnerships with state agriculture departments, cooperatives, and agri-tech companies. Integration with government land records and digital agriculture platforms will enable large-scale deployment for block- and district-level planning, ensuring both economic viability and social impact.

Applications

Precision Agriculture – Enables farm-level planning with accurate boundaries and crop health analytics for optimized irrigation, fertilizer, and pesticide use.

Land Management – Provides geo-verified boundary data for ownership validation, land-use classification, and dispute resolution.

Government Schemes & Subsidies – Supports transparent and targeted subsidy allocation using verified farm boundaries.

FPOs and Cooperatives – Facilitates block-level planning, yield estimation, and shared resource management.

Insurance & Finance – Assists in risk assessment and claim verification using accurate spatial data.

Research & Policy – Offers high-quality geospatial datasets for environmental monitoring, crop modeling, and agricultural policy formulation.
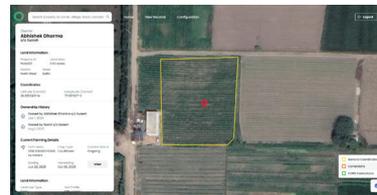
Environmental / Social Impact

The solution promotes sustainable and inclusive agricultural growth through precision and transparency. By using CORS-based mapping and geospatial analytics, farmers can optimize input usage, reducing water, fertilizer, and pesticide waste, thereby minimizing environmental degradation. Accurate boundary mapping helps prevent land disputes, strengthens tenure security, and supports fair subsidy distribution.

Socially, it empowers smallholder farmers and FPOs with actionable insights and data ownership, fostering trust, collaboration, and equitable access to modern technologies. Environmentally, it enables climate-resilient farming by improving water management, reducing carbon footprint, and supporting data-driven sustainable land-use planning at the block and district levels.

Contribution to Sustainable Development Goals (SDGs)

SDG 2, 6, 12, 13, 15 & 17