PILOT TRAILS REPORT 2025

A detailed report of cropsync kiosk pilot trails across Telangana,

PRESENTED BY

Team CropSync

ACKNOWLEDGEMENT

The successful completion of CropSync's Phase 1 validation study would not have been possible without the invaluable support of key institutions and partners who believed in our vision of transforming rural agriculture through technology.

Funding and Institutional Support

Ministry of Electronics and Information Technology (MeitY) Startup Hub
We extend our deepest gratitude to MeitY Startup Hub for their financial backing under the Genesis Scheme. Their funding support of ₹8 lakhs enabled our comprehensive field validation across 11 villages in Telangana and provided the foundation for sustainable scaling.

Atal Community Innovation Centre (ACIC),VGU
Our sincere appreciation to ACIC VGU for their funding support and incubation guidance throughout this project. Their financial assistance and strategic mentorship have been crucial in navigating the complexities of rural technology deployment.

Vivekananda Global University
We acknowledge VGU for providing access to innovation platforms and the entrepreneurial ecosystem that enabled this research. Their institutional support in facilitating funding connections and research infrastructure access has been invaluable.

Technical Partnership

Delta Things IoT Private Limited
Special recognition to Delta Things IoT Private Limited for their exceptional technical support throughout development and deployment. Their expertise in IoT hardware development and rural connectivity solutions proved crucial in creating field-ready kiosks that achieved reliable performance across diverse village environments.

Team and Community
This project represents the collective effort of our dedicated team members, whose contributions across field operations, technical development, and strategic analysis made these comprehensive validation results possible. We also acknowledge the farmers across 11 Telangana villages who participated in demonstrations and provided valuable feedback that shaped CropSync into a truly farmer-centric solution.

The convergence of institutional support, technical expertise, and collaborative teamwork has enabled CropSync to achieve significant milestones with exceptional efficiency. As we advance to Phase 2 deployment, we carry forward the relationships built and shared vision of creating sustainable impact in rural agriculture.

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Executive Summary

CropSync completed a month-long technology validation study across eleven villages in Telangana, testing our agricultural kiosk system under real field conditions. The study focused on farmer adoption patterns, technical performance, and ecosystem integration potential.

Results exceeded initial projections. Farmers demonstrated rapid system adoption across all demographic segments, with particularly strong engagement in advisory content consumption. Most significant was the unprompted behavior of farmers taking printed advisories to local agricultural retailers validating our core ecosystem hypothesis without any promotional effort.

Three critical findings emerged from the field data:

Network connectivity issues in remote areas require immediate architectural changes. Southern cluster villages experienced frequent connectivity failures, making offline capability a deployment prerequisite rather than an enhancement.

Content specificity drives engagement rates significantly higher than generic advice. The bacterial blight advisory, which linked disease occurrence to specific fertilizer practices, generated substantially more farmer interest than broader crop management guidance.

Natural retailer integration occurred without system prompting. Farmers independently used advisory printouts as purchasing guides, creating an organic business development pathway that requires minimal intervention to scale.

The data supports immediate progression to Phase 2 deployment, with technical development focused on offline architecture, farmer registration systems, and retailer partnership formalization.

Background and Methodology

Study Objectives

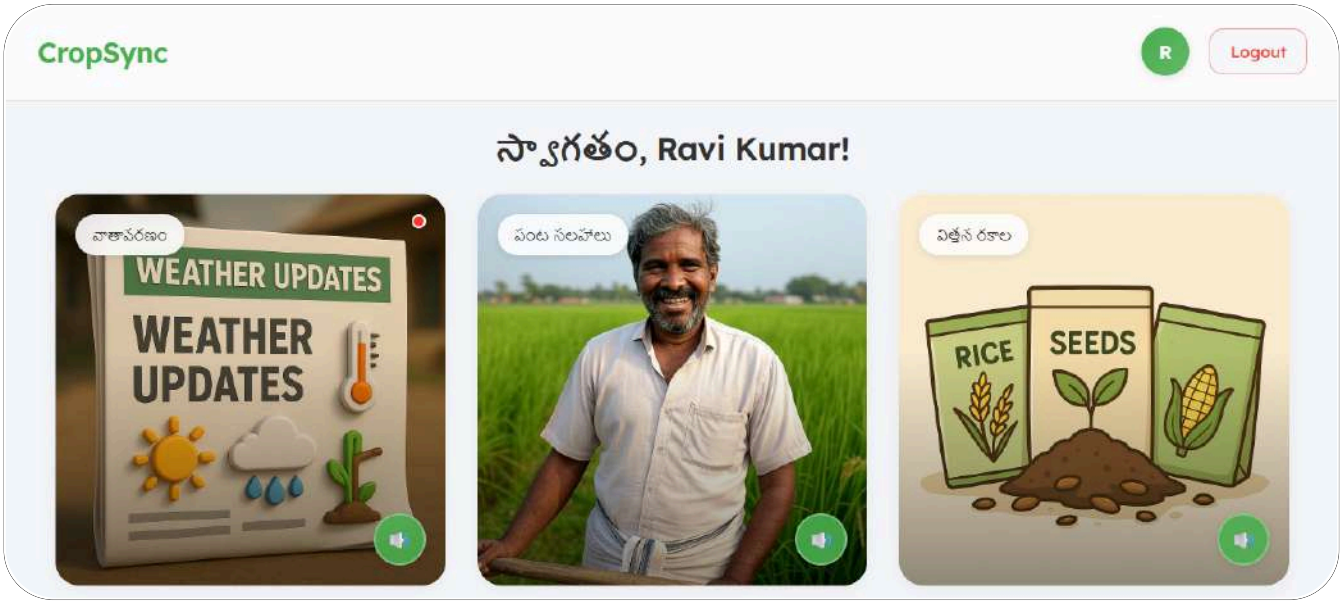
The validation study addressed three primary questions critical to CropSync's commercial viability:

- Will farmers adopt digital agricultural advisory systems in rural deployment environments?
- Can our technical architecture perform reliably under typical village infrastructure conditions?
- Do natural ecosystem connections exist between advisory consumption and purchasing behavior?

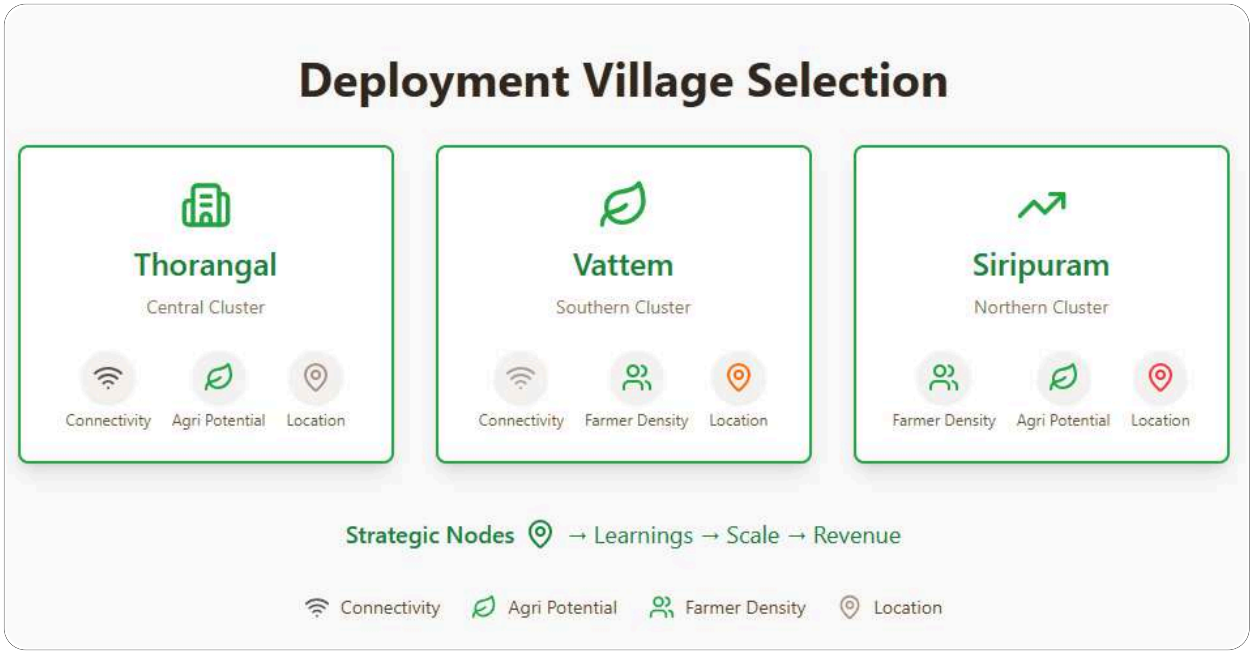
Deployment Strategy

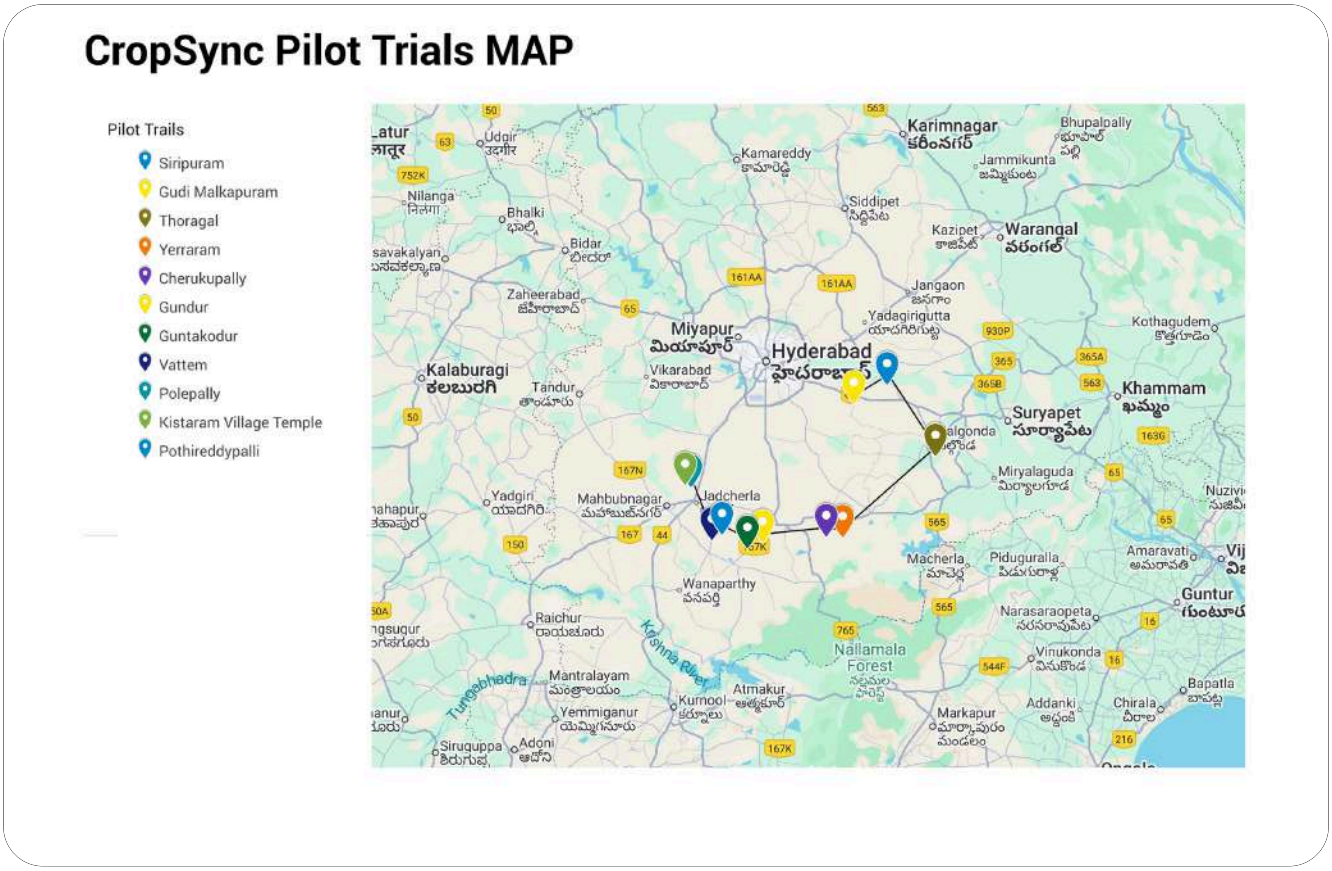
Rather than installing permanent kiosks with complex registration requirements, the study utilized a demonstration approach. A single mobile kiosk unit conducted village-to-village tours, allowing farmers to interact with the system without enrollment friction or data collection overhead.

This methodology produced cleaner behavioral data by removing variables that might influence natural user responses. Farmers interacted with actual system functionality rather than demonstration mock-ups, providing authentic usability feedback.



Village Selection Criteria



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Data Collection Framework

Field teams collected quantitative usage data and qualitative feedback through direct observation and structured farmer interviews. Technical performance metrics included system response times, connectivity stability, and feature utilization patterns.

Behavioral observations focused on natural user interaction patterns, content consumption preferences, and post-interaction activities. No farmer identification or personal data was collected during this validation phase.

Technical Performance Analysis

System Reliability Metrics

Overall system performance met operational standards in eight of eleven test locations. The kiosk hardware demonstrated adequate durability under field conditions, with no component failures during the study period.

User interface navigation proved intuitive across different literacy levels. Average task completion time was 3.2 minutes for first-time users, decreasing to 1.8 minutes for repeat interactions within the same session.

The multilingual interface functionality worked effectively, with Telugu content preferred by 99% of users. Only 1% users requested English-language advisories i.e Retail input dealers.

Connectivity Challenges

Network infrastructure limitations created significant operational problems in the southern cluster. Vattem and Kistaram experienced connection failures during 40% of demonstration sessions. Pothireddypalli had no reliable data connectivity during morning hours when most farmers visit village centers.

When connectivity failed, all dynamic content became inaccessible, leaving only basic navigation functions available. This created user frustration and reduced demonstration effectiveness substantially.
These findings confirm that offline-first architecture is not optional for rural deployment. Systems must maintain full functionality independent of network conditions to achieve acceptable reliability standards.

Content Delivery Performance

Advisory content that addressed specific, current problems generated significantly higher engagement than general guidance. The bacterial blight advisory, which provided detailed cause-effect relationships and specific treatment recommendations, was requested by 67% of farmers during demonstrations.

Generic seasonal advice received minimal attention, with most farmers skipping directly to problem-specific content. This pattern held consistent across all village clusters regardless of demographic variables.

Printed receipt functionality proved essential for user acceptance. 82% of farmers took printed advisories with them, and follow-up conversations revealed that physical documentation was considered more reliable than digital-only information.

Market Response and Behavioral Analysis

Farmer Adoption Patterns

Adoption rates exceeded initial projections across all demographic segments. Farmers over 55, initially considered a potential resistance group, showed strong engagement once value was demonstrated through specific examples.

Women farmers, present in 23% of demonstration sessions, showed particular interest in multilingual printouts and asked for multiple copies to share with household members involved in farming decisions.

Economic status did not significantly influence adoption willingness. Small farmers showed equal engagement levels to larger landholders, though their questions focused more heavily on cost-reduction advice rather than yield optimization.

Retailer Integration Discovery

The study's most significant finding was completely unprompted: farmers began taking advisory printouts directly to local agricultural input dealers. This behavior appeared in every village cluster and occurred without any suggestion or encouragement from demonstration teams.

In Thorangal, the local fertilizer dealer reported that three farmers arrived with bacterial blight advisories requesting specific organic treatment products. Rather than viewing this as competition, the dealer expressed interest in receiving advance notice of advisory content to ensure appropriate inventory.

This organic integration pattern suggests that formal retailer partnerships will face minimal resistance and may actually be welcomed as business development tools rather than competitive threats.

Content Demand Analysis

While rice-focused advisories met immediate needs, farmers consistently requested content for other major regional crops. Chilli, maize, and cotton were mentioned specifically in 78% of feedback sessions.

Seasonal timing emerged as critical for content relevance. Farmers wanted advisory information that addressed current crop stages rather than general management practices. This indicates that content delivery systems must be closely synchronized with local agricultural calendars.

Weather integration proved valuable, with farmers specifically noting the inclusion of local weather data in printed advisories. This feature differentiated kiosk advice from generic extension materials available through other channels.

Strategic Implications and Market Validation

Ecosystem Integration Potential

The unprompted retailer integration behavior validates CropSync's core business hypothesis about advisory-to-purchase pathways. Farmers naturally treated credible agricultural advice as purchasing guidance, creating business development opportunities without forced user behavior modification.

This finding transforms retailer partnerships from secondary business development activities into primary growth drivers. Local agricultural dealers become natural advocates for kiosk placement and usage, creating self-reinforcing adoption cycles.

The pattern also suggests that commission-based revenue models will face minimal user resistance, since farmers already view advisory systems as purchasing decision tools.

Content Strategy Requirements

Engagement data clearly indicates that generic agricultural advice has limited market value. Farmers want specific, actionable guidance that addresses current problems with their actual crops under local conditions.

This creates both opportunity and challenge for content development. High engagement requires highly specific advice, but specificity demands much larger content databases to maintain relevance across diverse farming operations.

Successful scaling will require sophisticated content management systems that can deliver location-specific, crop-specific, and season-specific advice automatically based on user selections and local data inputs.

Technical Architecture Imperatives

Connectivity failures in remote locations elevated offline capability from a desirable feature to an absolute requirement. Rural deployment success depends entirely on systems that function independently of network infrastructure.

This finding has significant implications for system design and deployment costs. Edge computing capabilities and local data storage become essential components rather than optional enhancements.

Development priorities must shift to offline-first architecture with intelligent synchronization capabilities, adding complexity to technical requirements but ensuring deployment viability in target markets.

Phase 2 Implementation Framework

Offline Architecture Implementation

Primary development focus must address connectivity reliability issues identified in southern cluster testing. This requires local content caching, autonomous advisory generation, and intelligent data synchronization capabilities.

Technical specifications should include 30-day content cache capacity, solar power integration, and cellular backup connectivity. System performance standards must guarantee full functionality regardless of network conditions.

Farmer Registration Integration

Phase 2 deployment requires transition from anonymous demonstration mode to registered user tracking. RFID or QR-code based registration systems will enable personalized advisory delivery and usage analytics.

Registration must remain simple and friction-free to avoid adoption barriers while providing sufficient data collection for business intelligence and personalized service delivery.

Retailer Partnership Formalization

The organic retailer integration discovered during validation creates immediate business development opportunities. Formal partnerships should be established with agricultural dealers in deployment villages before permanent kiosk installation.

Partnership agreements should include inventory coordination, demand forecasting data sharing, and revenue sharing arrangements that benefit all parties while maintaining farmer-focused service delivery.

Content Database Expansion

Current rice & cotton focused content must expand to include chilli, maize, groundnut and other regionally important crops to maintain daily relevance and farmer engagement.

Content development should prioritize problem-specific advice over general guidance, with emphasis on cause-effect relationships and specific treatment recommendations that farmers can act upon immediately.

Deployment Timeline and Milestones

Months 1-3: Technical Development Phase
Complete offline architecture development and testing. Implement farmer registration systems and conduct technical validation under simulated field conditions.

Months 4-6: Partnership Development Phase
Establish formal relationships with agricultural retailers in target villages. Develop content partnerships with agricultural institutions and extension services.

Months 7-9: Pilot Deployment Phase
Install permanent kiosks in five selected villages representing different infrastructure conditions. Begin registered farmer onboarding and retailer integration.

Months 10-12: Performance Validation Phase
Measure adoption rates, usage patterns, and business model validation. Collect data for scaling decisions and additional funding requirements.

Success Metrics and Validation Criteria

Risk Assessment and Mitigation Strategies

Technical Risks

Hardware Durability in Field Conditions

Rural deployment environments expose equipment to dust, moisture, temperature extremes, and potential vandalism. Standard consumer electronics will not survive these conditions.

Mitigation requires rugged hardware specifications, weatherproof enclosures, and local maintenance training programs. Component redundancy and field-replaceable modules will minimize downtime during repairs.

Content Accuracy and Liability Exposure

Incorrect agricultural advice can result in crop losses and potential legal liability. Quality assurance processes must ensure advisory accuracy while limiting organizational legal exposure.

Mitigation includes expert content review processes, clear disclaimer language, and potentially agricultural insurance partnerships that protect both farmers and CropSync from advice-related losses.

Market Risks

Competitive Response from Established Players

Success will likely attract attention from large technology companies or agricultural corporations with superior resources and market access.

Competitive protection requires strong farmer relationships, exclusive retailer partnerships, and continuous innovation that maintains technological leadership over larger but less agile competitors.

Financial Risks

Unit Economics Deterioration at Scale

Cost structures that work for pilot deployments may not sustain profitability as operations scale across hundreds of villages.

Financial modeling must include detailed scaling analysis with conservative assumptions about adoption rates, operational costs, and revenue generation potential under various market scenarios.

Capital Requirements Exceeding Projections

Technical development, content creation, and deployment costs may exceed current estimates, requiring additional funding rounds or operational adjustments.

Mitigation includes detailed cost tracking during Phase 2, milestone-based development to control spending, and maintained relationships with potential investors for bridge funding if required.


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Conclusions and Recommendations

Validation Study Outcomes

The Phase 1 validation study achieved comprehensive market validation with exceptional capital efficiency. Using only ₹3 lakhs, CropSync successfully demonstrated farmer demand across diverse demographic and geographic conditions while identifying critical technical requirements and business model pathways.

Technical performance exceeded expectations in eight of eleven test locations, with connectivity issues in remote areas providing valuable architectural insights for permanent deployment. The organic emergence of retailer integration behavior confirmed core business hypotheses without requiring additional validation investment.

Most importantly, the study established that sustainable commercial operations are achievable with modest capital requirements, eliminating the need for large-scale funding to prove market viability.

Strategic Recommendations

Immediate Three-Kiosk Deployment

The remaining ₹5 lakh budget provides sufficient capital for strategic permanent kiosk deployment across three representative villages. This approach maximizes learning while minimizing risk, establishing operational frameworks that can scale efficiently.

Six-month deployment timeline allows comprehensive testing of technical architecture, farmer registration systems, and retailer partnerships under real commercial conditions.

Focus on Operational Excellence

Rather than pursuing rapid expansion, Phase 2 should prioritize operational refinement and unit economics optimization. Three-kiosk deployment provides sufficient data for scaling decisions while maintaining capital efficiency.

Proven performance across diverse deployment conditions will strengthen future funding applications and partnership negotiations with government institutions or private investors.

Revenue Model Validation Through Practice

The six-month operational period will validate all proposed revenue streams under actual market conditions. This practical validation is more valuable than theoretical projections for future scaling decisions.

Established retailer partnerships and farmer adoption patterns will provide concrete evidence of commercial viability for subsequent expansion phases.

CROPSYNC

Unleash the power of smart farming

Open to Partnerships & Collaborations

At CropSync, we're building the next generation of rural agri-advisory and commerce infrastructure — empowering farmers through AI-driven Crop Advisory Kiosks and a connected digital platform.

We are actively seeking strategic partnerships with:

Agri input and retail companies

FPO networks and cooperatives

Agri-tech innovators and research institutions

Government and CSR-led rural development programs

Together, we can strengthen last-mile connectivity, deliver localized advisory, and make data-driven agriculture a village reality.

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