

AI for Bharat Hackathon

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Team Name : Unified Farm AI

Team Leader Name : Piyush Ramanlal Jagatiya

Team Member Name : Ipsita D Mehta

Problem Statement : An AI-powered solution that supports rural ecosystems, sustainability, or resource-efficient systems.



Brief about the Idea:

Content

- **Unified Ecosystem:** One platform with three interconnected modules — Farmer App, Buyer Marketplace, Government/Carbon Dashboard.
- **AI-Powered Guidance:** Personalized crop advisory, disaster alerts, and sustainability tips for farmers.
- **Transparent Market Access:** Buyers connect directly with farmers, ensuring traceability, freshness, and fair pricing.
- **Policy & Carbon Integration:** Governments and carbon firms monitor schemes, soil health, and issue verified carbon credits.
- **Offline-First Design:** Multilingual, voice/SMS support for rural, low-literacy users.

“Our idea builds a single AI-powered ecosystem connecting farmers, buyers, and governments. It delivers crop guidance, transparent market access, and verified carbon credits in one platform. Designed offline-first and multilingual, it ensures inclusivity, trust, and global scalability.”

Your solution should be able to explain the following:

- Most existing solutions are **fragmented, urban-centric, and single-purpose** (e.g., only crop advisory, only e-commerce, or only government dashboards). Our ecosystem is **offline-first, multilingual, and voice-enabled**, designed specifically for rural, low-literacy users.
- We integrate **AI guidance, market linkage, and carbon credit tracking** into one unified platform — something no current solution offers together
- **Farmers** receive AI-driven crop guidance, disaster alerts, and mentorship, improving yields and resilience. **Buyers** gain transparent access to fresh, traceable produce with blockchain-verified trust.
- **Governments & Carbon Firms** monitor schemes, measure impact, and issue verified carbon credits.
- By connecting all three stakeholders, the ecosystem **bridges the rural-urban divide** and ensures sustainable growth.
- **Farmer-centric design:** Offline capability, voice/SMS support, and multi-language accessibility. **Trust & transparency:** Blockchain-based certification and carbon credit issuance.
- **Scalability & sustainability:** Cloud-native, modular architecture ready for global adoption.
- **Holistic ecosystem:** One platform serving farmers, buyers, and governments simultaneously.

List of features offered by the solution

How Different Is It From Existing Ideas?

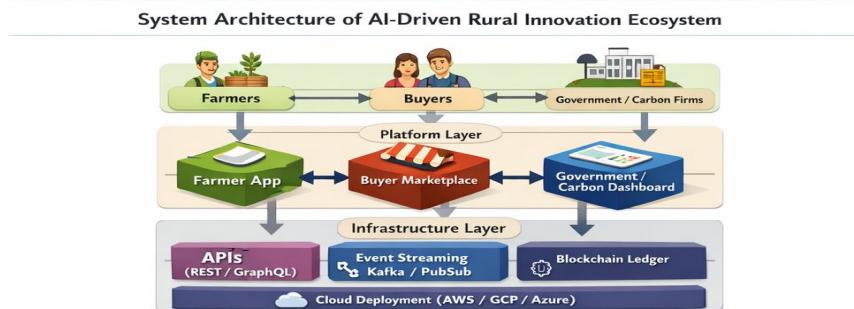
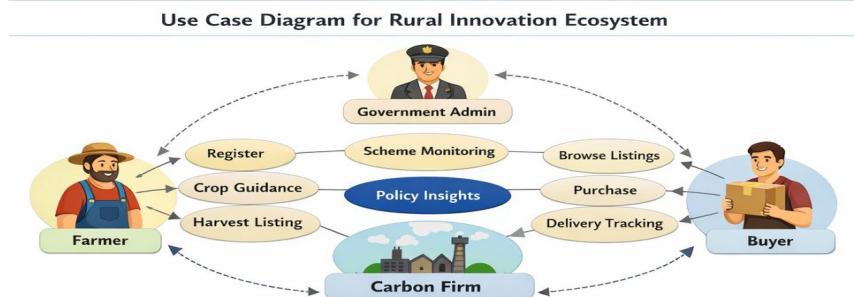
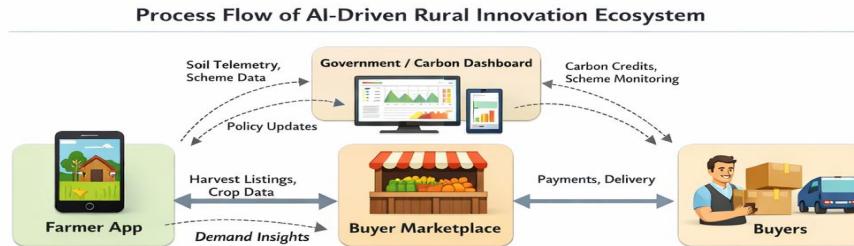
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How Will It Solve the Problem?

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USP of the Proposed Solution

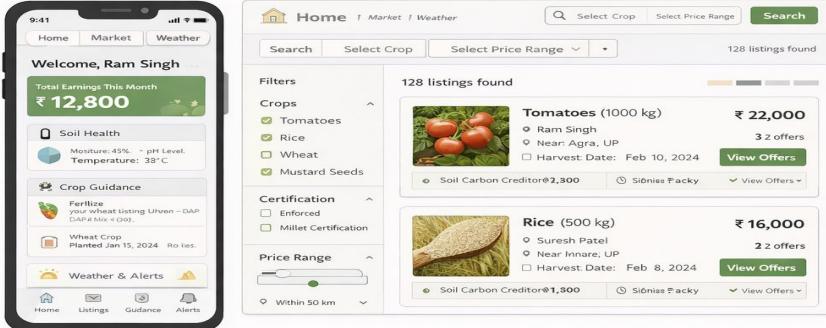
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- Farmer App → Buyer Marketplace → Buyers
- Farmer App → Government Dashboard → Government/Carbon Firms
- Feedback loops: Dashboard → Farmer App, Marketplace → Farmer App

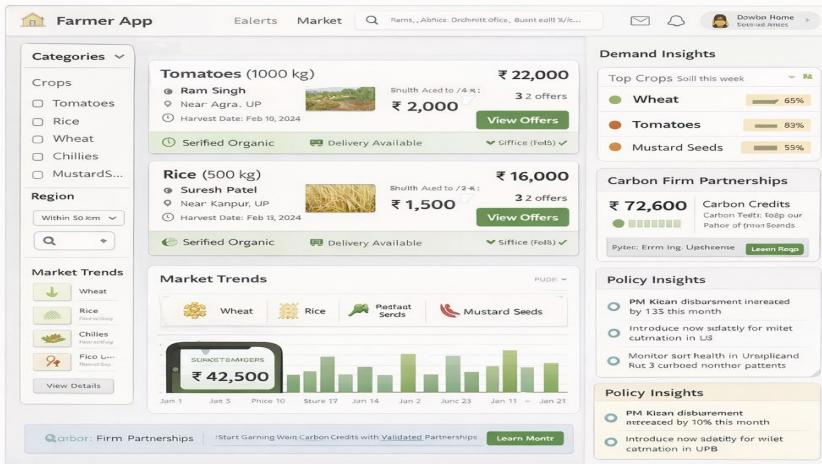
Wireframes/Mock of the Proposed Solution

Farmer App – Wireframe/Mock



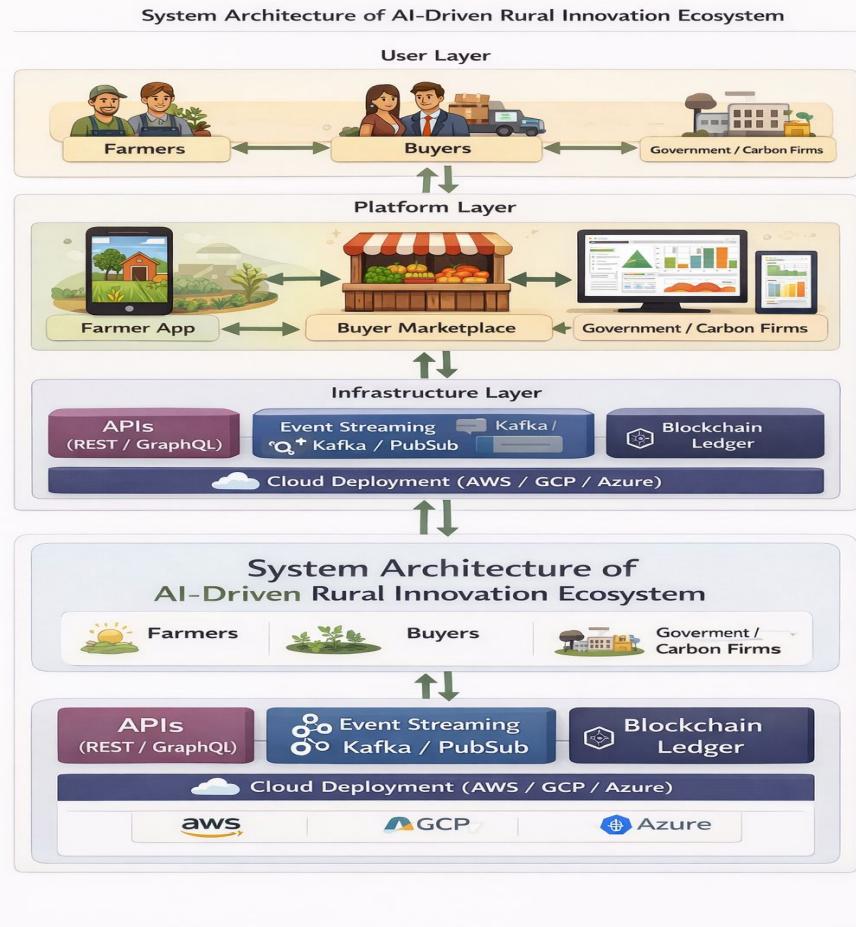
The Farmer App wireframe includes a mobile phone view and a desktop marketplace view. The mobile screen shows a welcome message for 'Ram Singh' with total earnings of ₹ 12,800, soil health metrics (moisture at 45%, pH level 7.8, temperature 38°C), crop guidance for fertilizers (DAP & OBA mix), and weather alerts. The desktop view shows a search interface with filters for Crops (Tomatoes, Rice, Wheat, Mustard Seeds), Certification (Enforced, Miler Certification), and Price Range (Within 50 km). It displays two listings: Tomatoes (1000 kg) by Ram Singh for ₹ 22,000 and Rice (500 kg) by Suresh Patel for ₹ 16,000, both with 'View Offers' buttons.

Buyer Marketplace – Wireframe/Mock



The Buyer Marketplace wireframe shows a detailed listing for Tomatoes (1000 kg) by Ram Singh for ₹ 22,000, with a note that it's Shulth Aced to 4/4. It also lists Rice (500 kg) by Suresh Patel for ₹ 16,000, which is Shulth Aced to 2/2. The dashboard features a sidebar with categories like Crops (Tomatoes, Rice, Wheat, Chilies, Mustard Seeds) and Region (Within 50 km). It includes sections for Market Trends (Wheat, Rice, Mustard Seeds, Chilies, Pesticides, Fertilizers) showing a bar chart with a total value of ₹ 42,500, Demand Insights (Top Crops: Wheat 65%, Tomatoes 83%, Mustard Seeds 55%), Carbon Firm Partnerships (₹ 72,600 Carbon Credits), and Policy Insights (PM Kisan disbursement increased by 13% this month, introduce soil salinity for winter cultivation in UPB).

- Farmer App home screen (crop guidance, alerts)
- Buyer Marketplace listing page (freshness indicator, buy button)
- Government Dashboard analytics (soil health, carbon credits)



- **User Layer:** Farmers, Buyers, Government/Carbon Firms
- **Platform Layer:** Farmer App, Buyer Marketplace, Government Dashboard
- **Infrastructure Layer:** APIs, Kafka/PubSub, Blockchain, Cloud (AWS/GCP/Azure, Kubernetes)

User Interfaces

- **Farmer App:** Android (Java/Kotlin), SMS/USSD, Voice IVR for offline and low-literacy users.
- **Buyer Marketplace:** Web (React/Angular) and Mobile (Flutter/React Native) with freshness indicators and secure payments.
- **Government/Carbon Dashboard:** Web analytics (React/Angular + D3.js/Chart.js) with role-based access.

Backend & APIs

- **Microservices architecture** for modular scalability.
- REST + GraphQL APIs for flexible data exchange.
- **Event-driven messaging** (Apache Kafka/Google PubSub) for real-time alerts and updates.
- **Authentication & Security:** OAuth2/JWT for secure sessions.

Data & Storage

- **Databases:** PostgreSQL/MySQL for structured data; MongoDB/DynamoDB for telemetry/unstructured data.
- **Blockchain ledger:** Hyperledger/Ethereum for certification, traceability, and carbon credits.
- **Data lifecycle management:** Secure storage, anonymization, consent-based sharing, archival.

AI & Analytic

- **AI Models:** Crop yield prediction, disaster alerts, market demand forecasting, carbon credit estimation.
- **Frameworks:** TensorFlow/PyTorch for training; AWS SageMaker for deployment.
- **Visualization:** Dashboards with Power BI/Tableau for government insights.

Cloud & Deployment

- **Cloud platforms:** AWS (preferred), Azure, GCP.
- **Containerization:** Docker + Kubernetes for scalability.
- **Serverless functions:** AWS Lambda/Azure Functions for lightweight tasks.
- **Monitoring & observability:** Prometheus, Grafana, ELK stack for logs, metrics, anomaly detection.

Security & Compliance

- **Encryption:** TLS/SSL for data in transit, AES for data at rest.
- **Consent management:** Farmer-controlled data sharing policies.
- **Compliance:** GDPR, local data protection laws, agricultural policy standards.

Integration Points

- **Payments:** UPI, bank APIs, mobile wallets.
- **Logistics:** Delivery APIs, route optimization services.
- **Carbon registries:** Verified carbon credit APIs.
- **Government schemes:** PM-Kisan, PMFBY, eNAM integration.

Minimum Viable Product (MVP)

- **₹40–60 Lakhs**
- Covers app development (Farmer App, Buyer Marketplace, Dashboard)
- Cloud hosting and basic blockchain setup
- Initial AI model training and deployment
- Pilot rollout in select rural districts

Scale-Up & Global Expansion

- **₹1.5–2 Crores+**
- Nationwide deployment with multilingual support
- Advanced AI models (climate resilience, carbon credit estimation)
- Smart city integration and global certification compliance
- Expanded infrastructure (Kubernetes clusters, advanced monitoring)

◆ Key Notes

- Costs include **development, infrastructure, and initial operations**.
- **Partnerships with government schemes and carbon registries** can reduce long-term costs.
- **Revenue streams:** marketplace commissions, carbon credit trading, premium analytics dashboards.

◆ Core Deliverables

- **Requirements Document (Requirements.md):**
 - User stories for farmers, buyers, and government stakeholders
 - Acceptance criteria mapped to hackathon problem statement
 - Clear alignment with rural usability and sustainability goals
- **Design Document (Design.md):**
 - Architecture diagrams (platform + infrastructure layers)
 - Process flow and use case diagrams
 - Security, scalability, and extensibility considerations
- **Presentation (PPT):**
- Problem & solution framing
- Differentiation and USP
- Features, technologies, cost estimates
- Visuals: process flow, use case, architecture, mockups

◆ Additional Enhancements

- **Visual Representations:** Process flow, use case, architecture diagrams, wireframes/mockups
- **Technology Stack:** AI, blockchain, cloud-native deployment, offline-first interfaces
- **Implementation Cost:** Estimated in INR for MVP and scale-up
- **Tagline & Branding:** Sanskrit-inspired team name *KrishiSetu* with tagline “*कृषिसेतुः लोकान् संयोजयति — KrishiSetu connects communities together*”

◆ Judge-Friendly Extras

- **Executive Summary:** One-page impact metrics (farmer income ↑, water saved, verified carbon credits issued)
- **Scalability Plan:** From pilot districts to nationwide/global adoption
- **Sustainability Impact:** Alignment with SDGs (Zero Hunger, Climate Action, Sustainable Communities)

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