



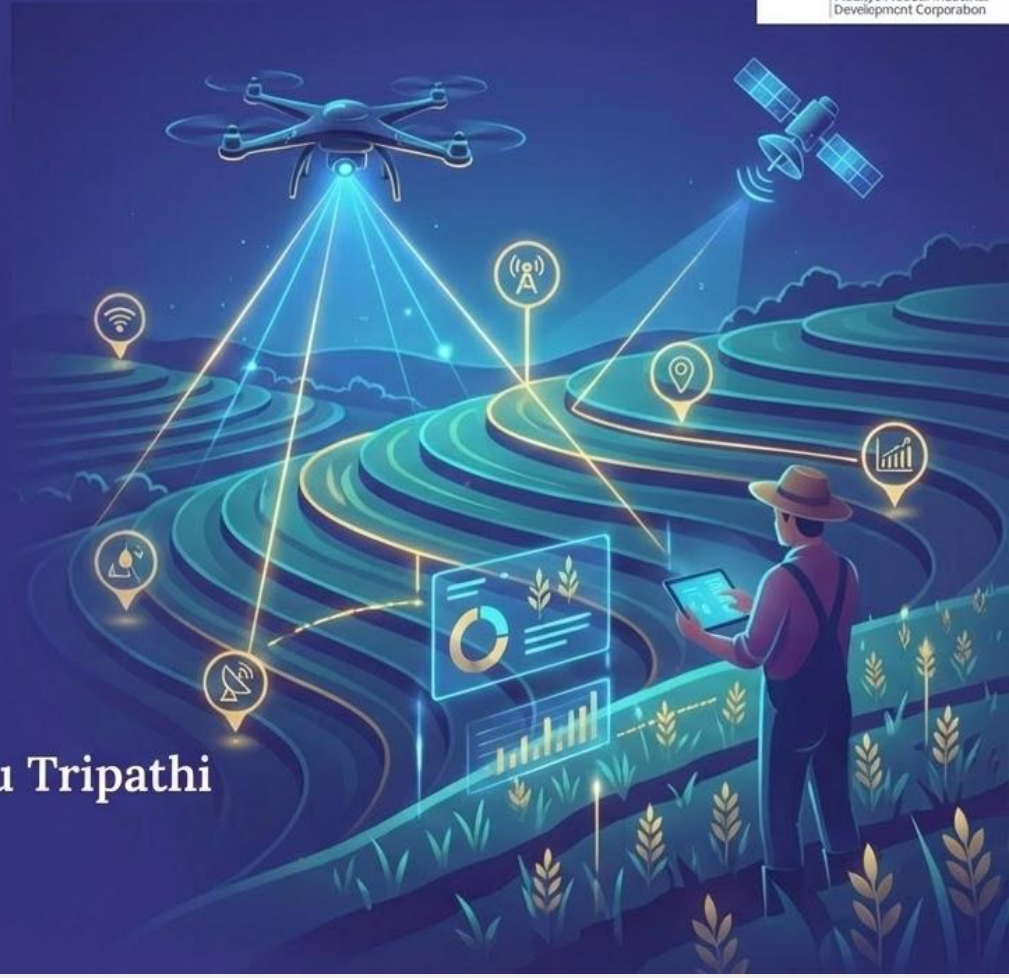
HACK&MAKE />

Code it. Build it. Ship it.

A One-Day Intensive Innovation Sprint
Hackathon + Makeathon + Export/ODOP Track

Team Details:

- Team name: Phantom Force
- Team leader name: Priyanshu Tripathi
- Theme: Smart Farmer



Problem Statement

- Farmers rely heavily on **experience and guesswork**
- Weather forecasts are **generic** and not crop-specific
- No visibility into future mandi prices
- Crop advisory is:
 - Non-personalized
 - Hard to understand
- Results in:
 - Crop losses
 - Poor market timing
 - Low and uncertain income

Farmers lack actionable, data-driven intelligence

Solution

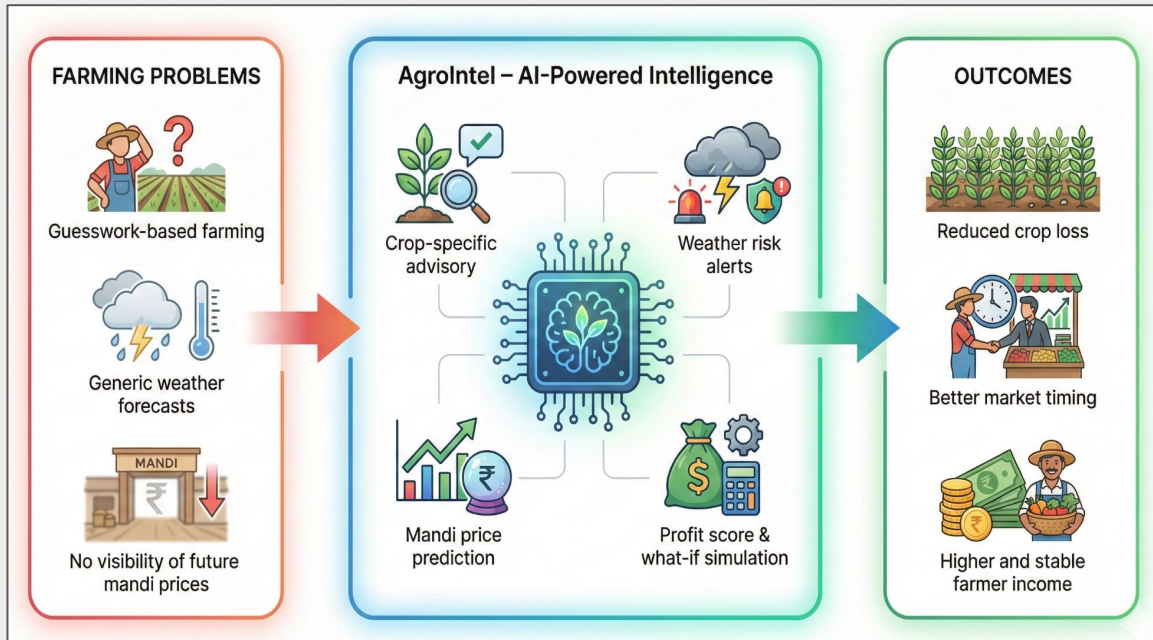
- An **AI-powered smart farming platform** for data-driven decision-making
- Provides **personalized crop advisory** based on crop type, location, and growth stage
- Delivers **crop-specific weather risk alerts** with preventive action suggestions
- Predicts **future mandi prices** to help farmers choose the best time to sell
- **Increases farmer profitability** by reducing uncertainty and improving decision accuracy
- **Reduces dependency on middlemen** through better market intelligence
- **Smart Government Scheme Recommendations** – Helps farmers discover & apply for relevant subsidies and schemes.

Innovation

- **Crop-Specific Intelligence:** Insights tailored to each farmer's crop and location
- **Profit-First Farming Score:** Single score combining yield, weather risk, and market trends
- **Predictive Insights:** Forecasts future weather risks and mandi prices
- **Explainable AI:** Clear “why” behind every recommendation
- **What-If Simulator:** Test decisions before taking action
- **Farmer Community Platform:** Peer learning and experience sharing among farmers.

How the Solution addresses the Problem

- **Replaces guesswork with data-driven decisions**
KrishiBandhu uses AI and real-time data to guide farmers instead of relying only on experience.
- **Transforms generic weather forecasts into crop-specific alerts**
Weather data is analyzed based on crop type and growth stage, providing actionable risk warnings and preventive steps.
- **Provides visibility into future mandi prices**
Time-series ML models predict upcoming price trends, helping farmers choose the best time to sell.
- **Delivers personalized and easy-to-understand crop advisory**
Recommendations are tailored to the farmer's crop, location, and stage, with clear explanations.
- **Simplifies complex analytics into clear decisions**
The Profit-First Farming Score and What-If Simulator help farmers quickly understand profitability and test options before acting.
- **Reduces losses and increases income**
By improving planning, risk management, and market timing, the platform directly improves farm outcomes.



Farming Problems → AI-Powered Intelligence → Clear Actions → Better Outcomes

Technology Stack

1. USER INTERFACE LAYER

Purpose: Farmer interaction & alerts

- Mobile App: Flutter / React PWA
- Multilingual + Voice Input
- Offline Mode (Low Internet Areas)
- Charts & Alerts Dashboard

2. BACKEND & API LAYER

Purpose: Logic, control, communication

- Backend Framework: FastAPI (Python)
- API Style: REST APIs
- Authentication: JWT + OTP
- API Gateway: NGINX

3. AI / ML INTELLIGENCE LAYER

Purpose: Decision-making brain

- Crop Advisory: Random Forest / XGBoost
- Weather Risk Engine: Rule + ML Based
- Price Prediction: LSTM / Prophet
- Explainable AI (Reason-based outputs)

4. DATA & STORAGE LAYER

Purpose: Reliable data foundation

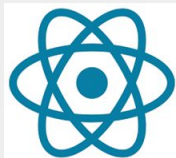
- Relational DB: PostgreSQL
- NoSQL DB: MongoDB
- Cache Layer: Redis
- External APIs: Weather & Mandi Data

Security & Compliance

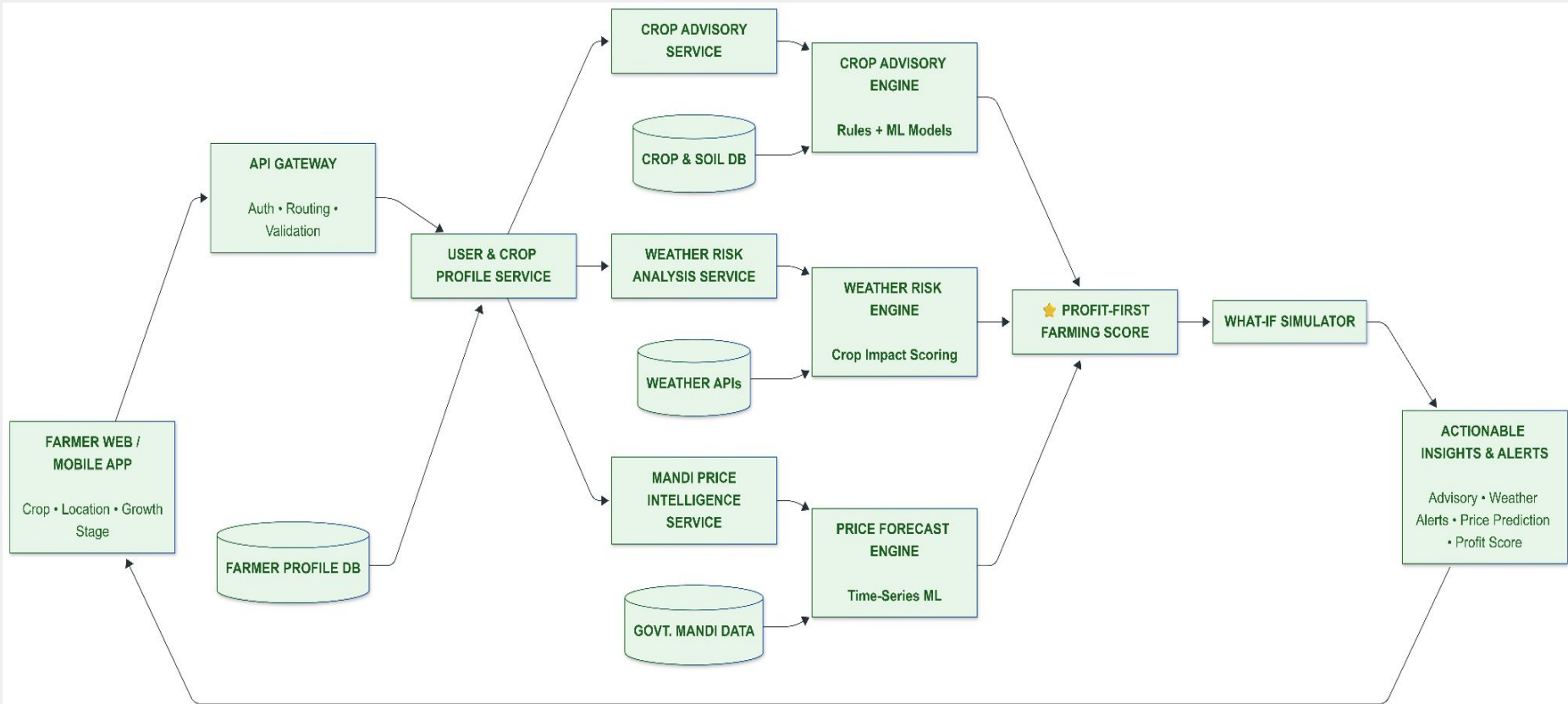
- HTTPS encryption on all data
- JWT auth for safe user identity
- Role-based access control
- Secure storage of price & crop data
- API rate-limiting prevents abuse
- Auditable logs for transparency
- Modular microservices reduce attack impact

Why this Stack ?

- Designed for low-bandwidth users
- Real AI models, not rule hacks
- Explainable recommendations farmers trust
- Modular services for rapid scaling
- Cloud deployment for national rollout
- Easy integration with govt & private datasets
- Ready for future automation & IoT



Architecture diagram of the proposed solution



Business & Feasibility

- Low-cost, scalable digital platform deployable across regions with minimal infrastructure
- Freemium model: Core features free for farmers, premium insights for FPOs and agribusinesses
- Marketplace-based revenue through transaction or service commissions
- Partnership opportunities with government bodies, NGOs, and agri-tech organizations
- High adoption potential due to mobile-first design, local language support, and SMS alerts



Next Steps:



Pilot Testing

In a selected district of Madhya Pradesh.



IoT Integration

Incorporate soil moisture & nutrient sensors.



Mobile App Launch

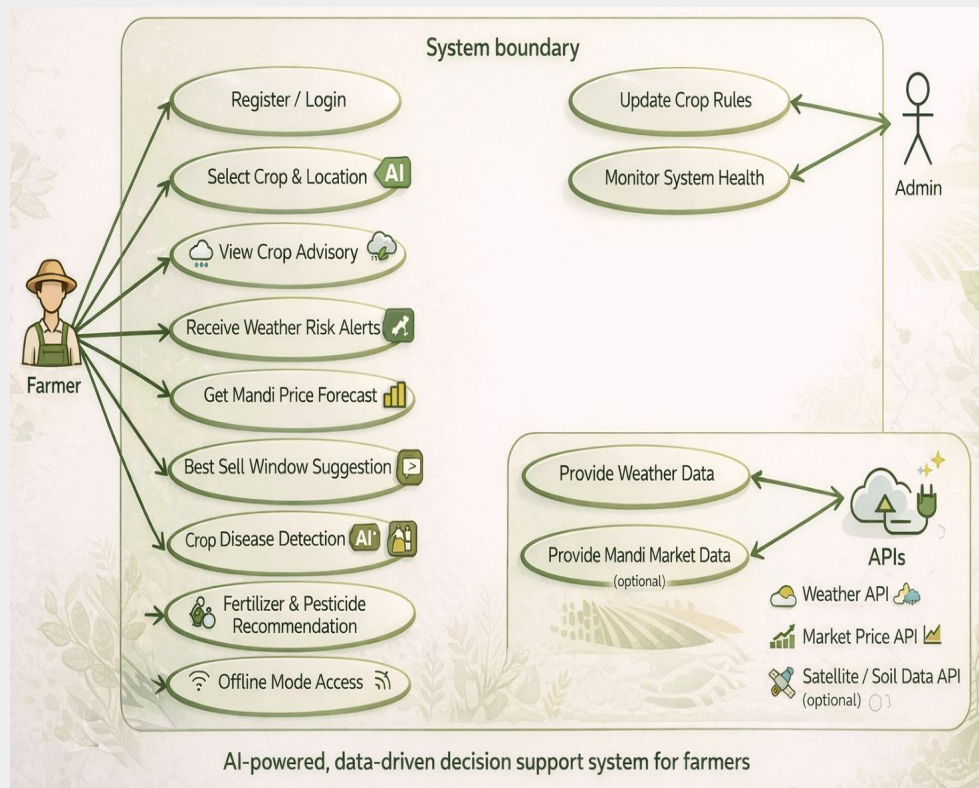
Develop user-friendly app for farmers.



Partnerships

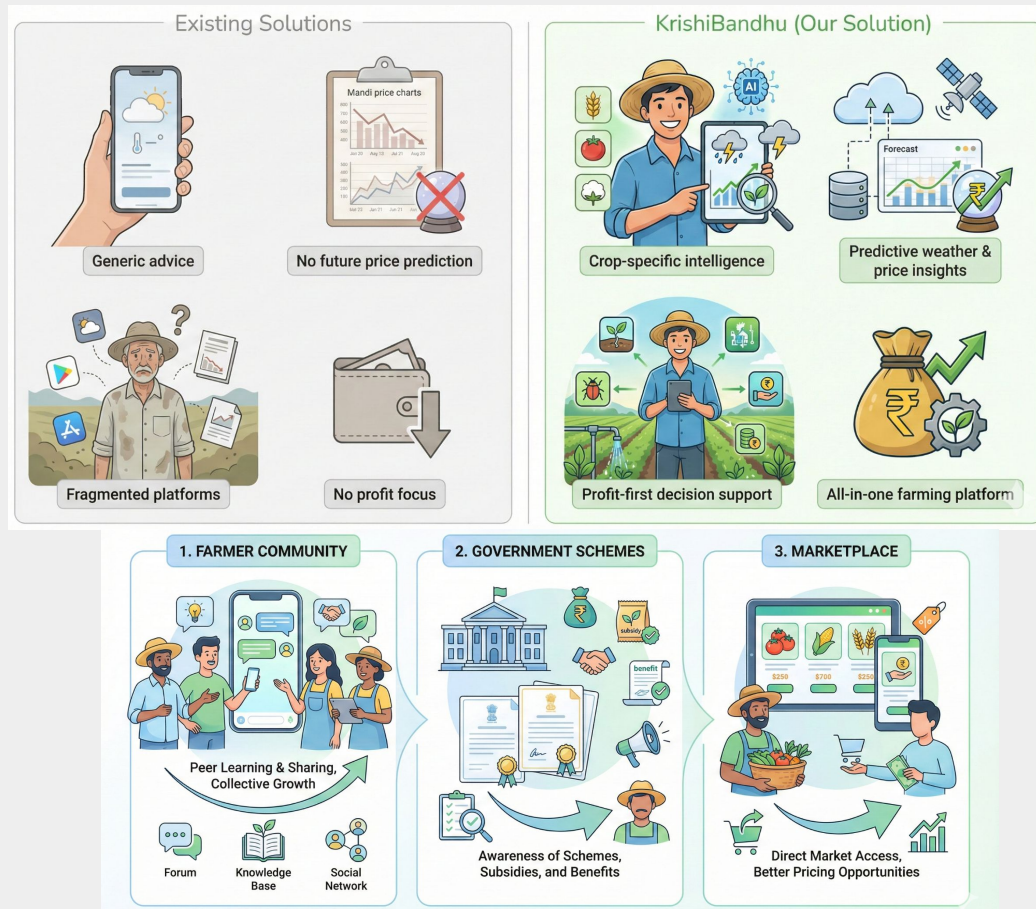
Collaborate with local agricultural universities.

Use-Case Diagram



How different is it from any of the other existing ideas?

Aspect	Other Platforms	Our Platform
Weather Alerts	General forecasts	Crop-specific risk alerts with actions
Market Prices	Current prices only	Future mandi price prediction
AI Transparency	Black-box suggestions	Explainable AI (“why this advice”)
Community	Limited or absent	Farmer-to-farmer knowledge sharing
Govt. Schemes	Static information	Personalized, eligibility-based schemes
User Experience	Text-heavy	Simple, voice-enabled, multilingual



Impact & Benefits

Key Feature	Impact & Value Delivered	Why It Matters / Who Benefits
Personalized Crop Advisory	Provides crop- and stage-specific guidance instead of generic advice.	Farmers → Better crop health and improved yield.
Crop-Specific Weather Alerts	Early detection of weather risks with preventive action suggestions.	Farmers → Reduced crop damage and losses.
Mandi Price Prediction	Forecasts future prices to help decide the best selling time.	Farmers → Higher profit through smart market timing.
Profit-First Farming Score	Combines yield, weather risk, and price trends into one clear score.	Farmers → Easy, profit-focused decision making.
Community	Enables farmers to share experiences, solutions, and local insights.	Farmers → Peer learning, faster problem solving, reduced isolation.
Government Schemes	Provides personalized information about eligible government schemes and subsidies.	Farmers → Better access to benefits, financial support, and policy-driven opportunities.
Data-Driven Farming Platform	Enables informed decisions using real-time and historical data.	Small & Marginal Farmers → Smarter farming at grassroots level.

Snapshots

KrishiBandhu

English

Dashboard

Crop Advisory

Weather Alerts

Mandi Prices

Simulator

Community

Marketplace

Schemes

Farm Log

Settings

Welcome back, Ramesh Kumar! 🌾

Bhopal, Madhya Pradesh • Currently growing Wheat on 5.2 acres

Today's Intelligence

Weather Risk

Next 7 days

Clear weather ahead

LOW

Price Trend

Wheat prices

₹2,450/quintal

+6% this week

RISING

Latest Advisory

Fertilizer Application

Apply 50kg Urea per acre. Nitrogen is critical at tillering stage.

87% Confidence

Profit Score

Your current profit potential based on crop condition, market prices, and weather

78% Profit

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Recent Alerts

Actionable suggestions for your farm

Heavy Rainfall Warning

Expected 50-70mm rainfall in next 48 hours

Harvest early or provide drainage

HIGH

Temperature Drop

Temperature expected to drop to 8°C

Cover crops with protective sheets

MEDIUM

KrishiBandhu

English

Dashboard

Crop Advisory

Weather Alerts

Mandi Prices

Simulator

Community

Marketplace

Schemes

Farm Log

Settings

Crop Advisory

AI-powered personalized recommendations for your farm

Selected Crop

Wheat

Growth Stage

Tillering

Sowing Advice

95% Confidence

Optimal sowing window has passed. Focus on irrigation and fertilization.

Why: Sowing after November 25th reduces yield by 25kg/acre/day due to terminal heat stress.

Accuracy Score

96/100

Irrigation

88% Confidence

Water every 5-7 days. Current soil moisture is adequate.

Why: Tillering stage is critical for crown root initiation. Water stress now leads to poor tillering.

Accuracy Score

88/100

Fertilizer

92% Confidence

Apply 50kg Urea per acre. Nitrogen is critical at this stage.

Why: Plants need maximum Nitrogen during tillering for vegetative growth.

Accuracy Score

92/100

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Government Schemes

Find and apply for relevant government subsidies and programs

PM Kisan Samman Nidhi

Financial support of ₹6,000 per year to farmer families.

Active

Benefits

₹6,000/year

Eligibility

Small and marginal farmers

Deadline

Open all year

Apply Now

Soil Health Card Scheme

Get soil tested and receive a health card with crop-wise nutrient recommendations.

Active

Benefits

Free Soil Testing

Eligibility

All farmers

Deadline

Open all year

Apply Now

Best Selling Window

Recommended Date Range

1/12/2024 - 1/14/2024

Prices are expected to peak during this period. Plan your harvest and transportation accordingly.

Recommendation

Hold

Wait for better prices

Price Volatility

MEDIUM

Price range: ₹2,450 - ₹2,600

Moderate price movements expected.

Sun, Jan 11

Clouds

25°C / 13°C

LOW

Mon, Jan 12

Clouds

25°C / 12°C

LOW

Crop-Specific Risk Indicators

Heavy Rainfall Warning

Expected 50-70mm rainfall in next 48 hours

Crop Impact

May damage standing wheat crop

Suggested Action

Harvest early or provide drainage

HIGH

Temperature Drop

Temperature expected to drop to 8°C

Crop Impact

Frost risk for sensitive crops

Suggested Action

Cover crops with protective sheets

MEDIUM

Alert Preferences

Choose how you want to receive weather alerts

Push Notifications

Get instant alerts on your device

SMS Alerts

Receive alerts via text message

Note: Alerts are sent only for medium and high-risk weather conditions to avoid notification fatigue.

(No Title)



Thank You