

CropBalance AI

Preventing Market Saturation & Price Crashes in Indian Agriculture

Team CropBalance

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Made with **GAMMA**

The Critical Challenge: Herd Mentality in Indian Agriculture

Indian farmers often make planting decisions based on the previous year's market prices—a dangerous reactive approach that creates predictable boom-and-bust cycles.

When onion prices soared to ₹50/kg in 2024, countless farmers pivoted to onion cultivation for the following season. This collective response, whilst individually rational, creates a systemic problem.

The inevitable result? Massive oversupply floods markets, triggering catastrophic price crashes—sometimes plummeting to as low as ₹2/kg. These dramatic swings devastate farmer livelihoods and destabilise rural economies.

Current agricultural apps focus on weather forecasting, but critically, no tool exists to predict market supply cycles and warn farmers of impending saturation risks.



The Devastating Impact of Market Saturation

₹50

Peak Price per Kg

Price during shortage that triggers mass planting

₹2

Crash Price per Kg

Devastating lows after oversupply hits markets

96%

Price Decline

Catastrophic loss destroying farmer income

This vicious cycle repeats season after season, trapping farmers in a system where yesterday's success becomes tomorrow's financial ruin. Breaking this pattern requires forward-looking market intelligence—not reactive decision-making.



Introducing CropBalance AI: Your Market Intelligence Agent

We've developed an innovative AI-powered solution that predicts saturation risks *before* planting begins—giving farmers the foresight they need to make profitable decisions.



Oversupply Prediction

Advanced Linear Regression models analyse historical sowing patterns to estimate total cultivation area and identify saturation risks before seeds hit the soil.



Financial Risk Alerts

Quantifies potential losses in clear rupee terms (e.g., "Estimated Loss: ₹50,000") to help farmers understand real financial consequences and avoid devastating decisions.



Smart Recommendations

Suggests profitable alternative crops that match local weather conditions and have better market prospects—transforming data into actionable farming strategies.

How CropBalance AI Works



Data Collection

Aggregates historical APMC market data, sowing patterns, and price trends across multiple seasons and regions.

AI Analysis

Machine learning algorithms identify patterns and predict future market saturation based on current planting intentions.



Risk Assessment

Calculates financial exposure and generates personalised alerts for crops showing saturation indicators.

Recommendations

Delivers actionable crop alternatives with profit potential and market viability scores tailored to each farmer's region.

Our system transforms complex market dynamics into simple, farmer-friendly guidance—empowering better decisions through predictive intelligence rather than reactive guesswork.

Robust Technology Stack Built for Scale



Cloud Architecture

Microsoft Azure Machine Learning provides enterprise-grade computational power, whilst Azure SQL Database ensures secure, scalable data management for millions of agricultural records.



Core Algorithm

Python powers our system, leveraging Scikit-Learn's Linear Regression models to deliver accurate supply forecasts based on multi-year agricultural patterns and market behaviour.



Data Processing

Pandas library efficiently analyses vast volumes of historical APMC market data, transforming raw numbers into actionable insights through sophisticated data manipulation.



User Interface

Streamlit delivers a responsive, intuitive web application that works seamlessly across devices—making complex predictions accessible to farmers with varying technical literacy.



Technology Architecture Overview

System Components

- **Frontend Layer:** Streamlit web interface optimised for mobile and desktop access
- **Intelligence Layer:** Python-based ML models running on Azure infrastructure
- **Data Layer:** Azure SQL Database with APMC market integration
- **Analytics Engine:** Scikit-Learn algorithms processing historical patterns



Our architecture prioritises **scalability, reliability, and accessibility**—essential for serving India's diverse agricultural landscape across varying connectivity conditions.

Our Roadmap: From Prototype to National Impact

1

Phase 1: Foundation (2025 - Today)

Functional prototype successfully deployed using historical APMC data. Core prediction algorithms validated through back-testing against actual market outcomes. Initial user testing with farmer focus groups completed.

2

Phase 2: Integration (2026)

Live API integration with government portals including data.gov.in for real-time market arrival data. Enhanced prediction accuracy through continuous learning. Partnership establishment with agricultural departments in pilot states.

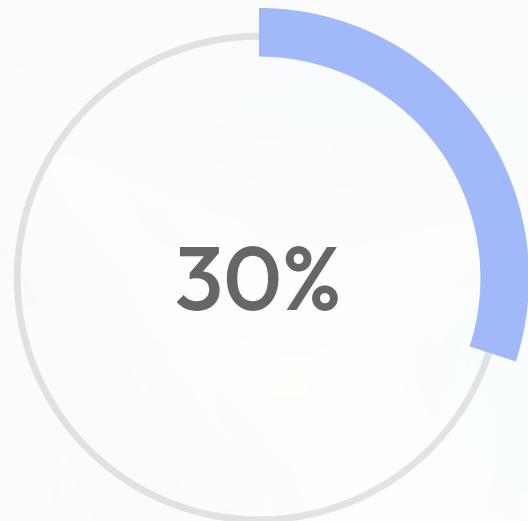
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Phase 3: Universal Access (2027)

SMS and voice-based alert system deployment for farmers without smartphone access. Regional language support across 12+ Indian languages. Expansion to 100+ districts nationwide with localised crop recommendations.

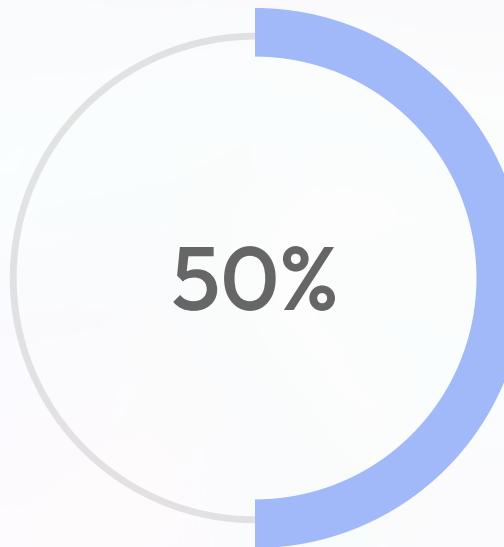


Projected Impact: Transforming Agricultural Economics



Price Volatility Reduction

Target decrease in market price fluctuations within pilot districts by 2027



Farmer Adoption Goal

Percentage of farmers in pilot regions actively using CropBalance AI for planting decisions



Aggregate Savings

Estimated combined financial losses prevented per district annually

- Beyond Individual Farmers:** By preventing herd mentality at scale, CropBalance AI stabilises entire regional markets—benefiting consumers through consistent pricing whilst protecting producer incomes. This creates a healthier, more predictable agricultural economy for all stakeholders.

Join Us in Revolutionising Indian Agriculture

Why CropBalance AI Matters

We're not just building software—we're transforming how Indian farmers make decisions. By replacing reactive guesswork with predictive intelligence, we can break the boom-bust cycle that has trapped rural communities for generations.

Our vision is simple: empower every Indian farmer with the market foresight currently available only to large agribusinesses.

Ready to Partner?

We're seeking collaborations with policymakers, agricultural extension officers, and impact investors who share our commitment to sustainable, data-driven farming.



Contact Team CropBalance

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Let's build a more stable, prosperous agricultural future together.