

Imagine that you are in 2030 and the world is progressing at a rapid pace.

Identify a potential problem in this world and solve it using an innovative product of the future.

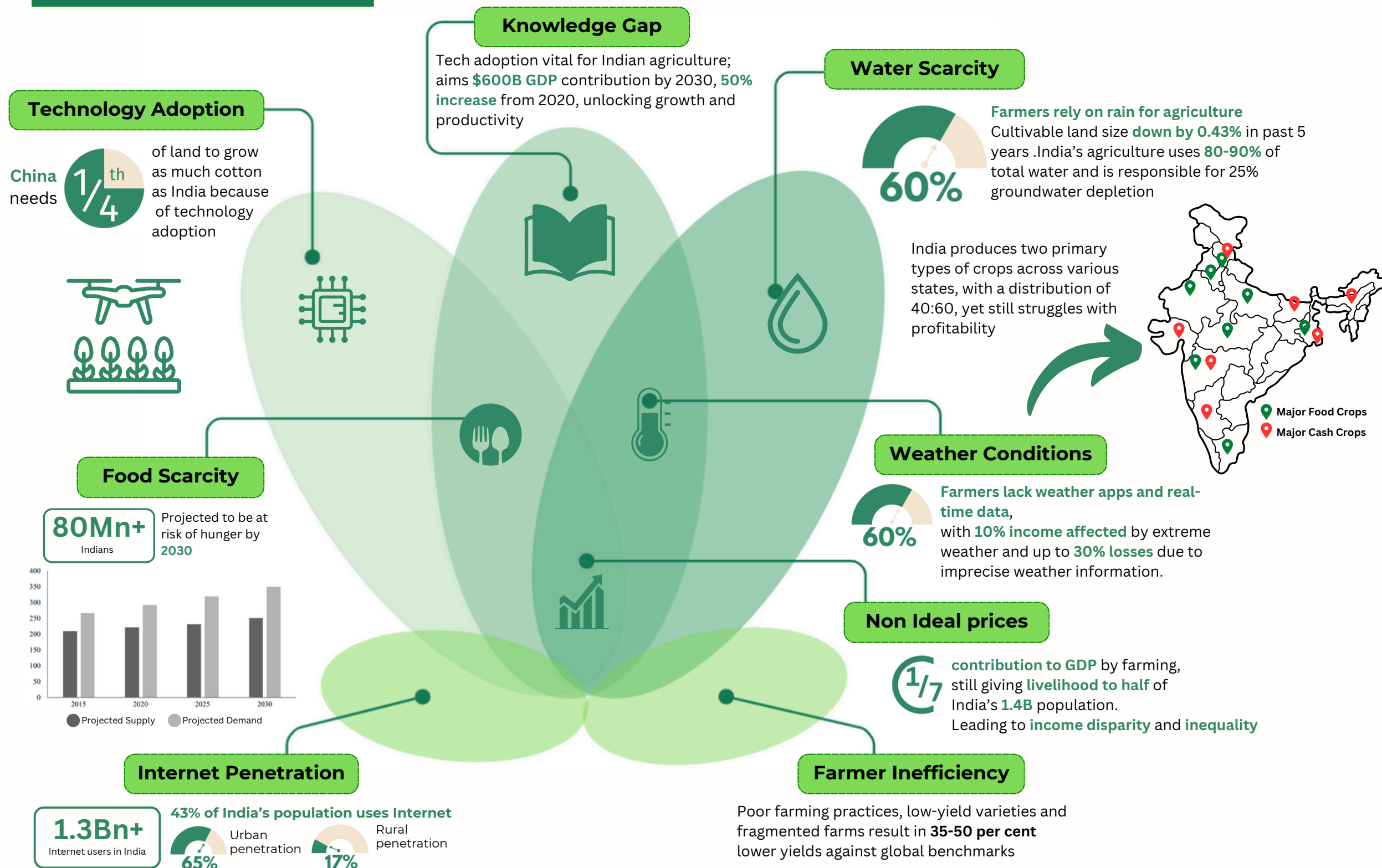
- What do you think will be a 2030 problem and why do you think so?
- Who will you solve for first and why?
- What part of the problem will you solve for first and how will you solve it using the tech of tomorrow?
- Comment on the feasibility of your solution by 2030.
- How will you measure the success of your product and what are the potential pitfalls in your solution?

Problem Statement

The agricultural industry faces a critical challenge—limited connectivity infrastructure and slow digital tool adoption. This impedes efficiency, sustainability, and resilience, hindering its ability to meet the increasing food demands.



Key Problems



Potential

- By 2030, India will be the **world's most populous** nation, with over **half its population under 40**.
- Potential shortfall of nearly **42 million tons** of fruits and vegetables.
- Rapid technological advancements** offer a chance to **revolutionize** farming.

Challenges

- Traditional agricultural knowledge** transfer is **declining**.
- Lack of access to real-time data** leads to inefficiencies, crop losses, and financial instability.
- Data Highlight: Pests and diseases cause a **20-40%** reduction in global crop yields

Need for it

- Advanced device** with sensors providing **real-time** crop, soil, and weather data.
- An **integrated app** offering insights, market analysis, and direct selling platforms.
- Data Highlight: Efficient irrigation can reduce water use by **8-20%**

Deep Dive

By 2030, bolstered internet penetration and technology adoption will empower us to enhance agricultural efficiency, bridge knowledge gaps, and advance weather forecasting in the farming sector.



User Personas



Demographics

Age: 45
Gender: Male
Location: Haryana, India
Education: High School

Age: 38
Gender: Female
Location: Telangana, India
Education: Primary School

Age: 33
Gender: Male
Location: Karnataka, India
Education: Secondary School

Background

- Manages a vast farmland that is been profitable over years

- Manages a small plot of land, inherited from her parents

- Owns a small plot of land with limited resources

Pain Points

- Crop wastage due to unpredictable diseases in large-scale operations.
- Limited real-time field insights with available technology.
- Difficulty staying updated on agricultural advancements and knowledge

- Limited resources mean she can't afford significant crop losses.
- Wants to adopt modern techniques but has limited access to technology and knowledge.
- Struggles to get fair prices in the local market, leading to financial instability.

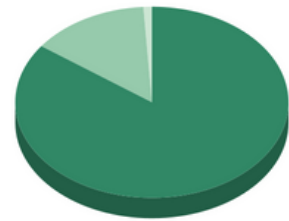
- Has noticed a decrease in yield over the years.
- Struggles with understanding modern agricultural techniques.
- Faces challenges with erratic weather patterns affecting her crops.

Goals

- Reduce crop wastage, improve yield, and streamline farming
- Connect with markets for demand and price trend insights.

- Improve the quality and quantity of her produce using sustainable methods
- Find better markets or buyers for her produce

- Understand and possibly adopt new farming techniques that can help her farm
- Get fair prices for his produce



- Small Farmers: Landholding less than 2 hectares
- Medium Farmers: Landholding between 2-10 hectares
- Big Farmers: Landholding greater than 10 hectares

Segmentation of Farmers based on land usage

Who we are solving for? And why?

Big Farmers

1% = 1.5 Mn farmers
Owns ~ 55% Crop area

Financially equipped for tech investment
Less tied to traditional methods
Set trends in the community

Medium Farmers

14% = 21 Mn farmers
Owns ~ 30% Crop area

Have resources but seek proven tech
Motivated by big farmer successes
Integrate tech to compete and expand

Small Farmers

85% = 128 Mn farmers
Owns ~ 15% Crop area

Adopt tech after seeing community benefits
Prioritize proven, cost-effective tech
Follow the lead of larger farmers

Weather

- Extreme temperatures and droughts are already shrinking farmer incomes to the tune of **4-14% for key crops**, a number that is expected to go up this decade
- Lack of precise weather data results in losses of up to **30%** in some agricultural regions

Non ideal price

- Variability results in farmers receiving different prices for same crop, highlighting the **lack of price stability and uniformity**.
- Indian farmers often receive only a **fraction of the final retail price** for their agricultural produce, with a significant portion going to intermediaries.

Food security

- Consistent and increased produce.
- Sustainable farming methods for future food security.
- Diverse crops catering to varied dietary needs.

Bridging the Knowledge Gap

- Consolidated knowledge base in user-friendly format
- Continuous learning and adaptation for farmers
- Improved decision-making based on data and insight

The Impact!

- Increased yields and **reduced losses by 25%**
- Sustainable farming practices, optimizing resource usage with **30% efficiency**
- Direct market access ensuring fair prices, boosting farmers' income by cutting **20% of middleman**

KhetConnect

The Impact!

- Real-time data can raise crop yields by **20%**, offsetting India's **42 million ton** shortfall by 2030
- "Closing knowledge gaps cuts crop wastage by **15%**, saving Indian farmers **\$10 billion** annually."
- "Tech-enabled direct market access boosts farmers' income by **25%**, elevating millions from poverty."

51% Increase in internet users from 2020 to 2030
9% Internet penetration in India

- The **global IoT in agriculture** market size is projected to reach **USD 28.56 billion** by 2030
- The revenue generated in the global AI in agriculture market is expected to increase to **\$11.2 billion in 2030** from **\$671.6 million in 2019**

Solution Overview

Unlock the future of farming with KhetConnect: IoT, tractor cameras, and Gen AI, driven by advanced internet, offer real-time guidance and optimal pricing for enhanced productivity and efficiency.

AgriTech Vision Module Setup

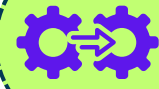


Physical Design

- **Compact and Durable:** The device should be robust enough to withstand the rough conditions of a farm. It should be weatherproof and resistant to dust and dirt.
- **Easy Attachment:** The device can be attached to the tractor using a clamp or magnetic system, allowing it to be easily mounted and dismounted.
- **360-Degree Rotation:** This will ensure the device can capture images and data from all angles, covering the maximum area

Integration & Installation on Tractor

- **Position:** The AVM should be installed on the top-front portion of the tractor, similar to where a rearview mirror would be on a vehicle. This position offers the device a clear, unobstructed view of the field ahead, ensuring maximum coverage as the tractor moves
- **Protection:** Given that tractors often operate in dusty or wet conditions, the device should be housed in a protective casing that's both waterproof and dustproof.



- **High-Resolution Cameras:** For detailed image recognition, capturing even minor defects or signs of disease in crops.
- **Infrared Sensors:** To assess plant health, as unhealthy plants often reflect infrared light differently than healthy ones.
- **Weather Sensors:** To capture real-time data on temperature, humidity, and rainfall.
- **Soil Sensors:** Embedded in the device, these will measure soil moisture, pH, and nutrient levels



Technical Components

Features bundled

Precision AgriTech

Employ **DeepVision** to harness data from cameras for precise weed detection and herbicide application. Combine this with **GPS-guided tractors** and real-time **IoT soil sensors** for accurate seed and fertilizer placement, optimizing crop growth.

AgriCommerce Optimization

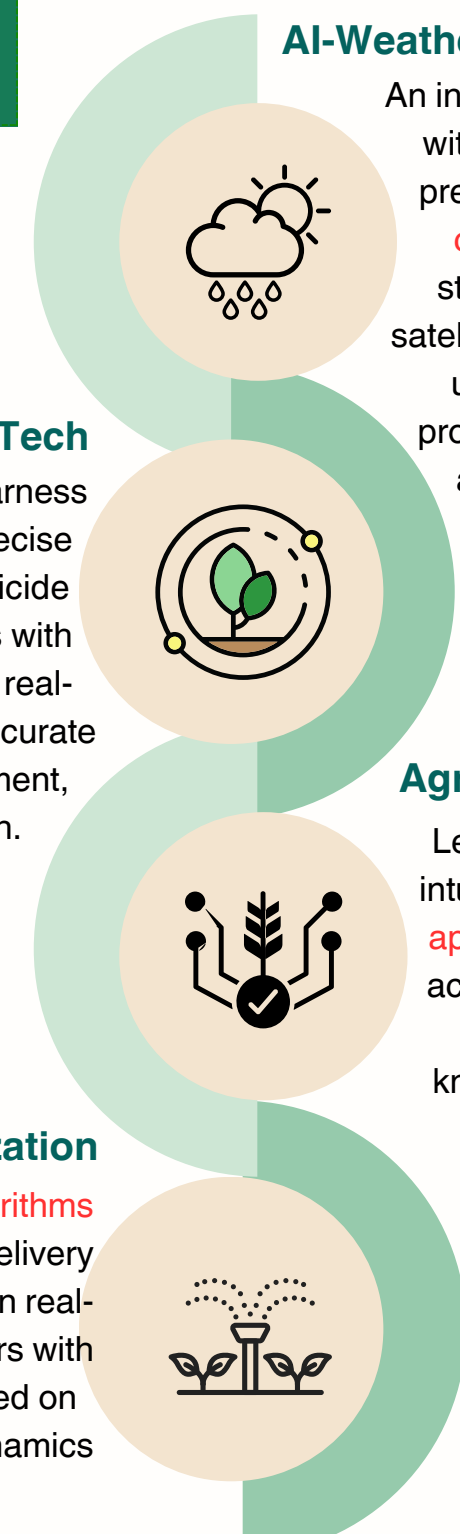
Employ **dynamic pricing algorithms** alongside an expansive delivery network to adjust prices in real-time, providing farmers with competitive rates based on demand and supply dynamics

AI-Weather Precision Irrigation

An integrated irrigation solution with **AI-enhanced weather** predictions, **remote mobile control**, and long-term strategies, incorporating satellite data to optimize water use and enhance crop productivity for sustainable agriculture

Agri-Assist

Leverage NLP to create an intuitive **chatbot and mobile app**, offering farmers easy access to a treasure trove of time-tested farming knowledge and practices, fostering agricultural sustainability and modernization



Problem Statement

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Use

Data Collected



Camera

- High-resolution for precise image recognition, detecting crop defects or diseases.
- Enables visual data collection for farm monitoring and analysis.

- Visual images of crops
- Detection of defects or diseases
- Crop growth monitoring



Soil Sensor

- Measures soil moisture, pH, and nutrient levels for optimal crop growth.
- Assists in precise soil management and irrigation control.

- Soil moisture levels
- Soil pH
- Nutrient content in the soil



Weather

- Captures real-time data on temperature, humidity, and rainfall conditions.
- Provides crucial weather information for informed farming decisions.

- Temperature
- Humidity
- Rainfall

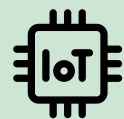


Infrared

- Assess plant health by detecting infrared light differences in plants.
- Identifies stressed or unhealthy crops through non-visible light.

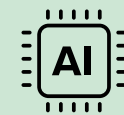
- Infrared light reflection from plants
- Identification of plant health conditions

Feasibility



1. IoT Adaptability & : Smart Farming Adoption :

By 2030, AVM's IoT integration predicts and optimizes farming processes
Real-time and predictive insights ensure competitive, efficient farming



2. Advanced AI & Cloud Integration : Adoption :

Harmonious use of algorithms and cloud for swift data processing by 2030
Fast, AI-driven insights empower proactive, yield-maximizing actions



3. Sensor Technology: Adoption :

Devices with multifunctional sensors provide all-encompassing farm analysis
Single-module insights drive efficient, data-oriented farm management

The checklist benefits farmers with:

1. **AI Recommendations:** Tailored tasks based on real-time farm data.
2. **Voice Alerts:** Hands-free task reminders.
3. **Predictive Scheduling:** Forecasts tasks using weather and soil analytics.
4. **Task Tracking:** Instant feedback on completed tasks.
5. **Farm Dashboard:** At-a-glance view of upcoming tasks.



Use the app with link given below

Prototype

The operational tractor's **AVM** scan **field images** and utilizes onboard **AI** for instant analysis and feedback

Working

Captured data is transmitted to the **cloud** for deeper analysis, storage, and **generating actionable insights**

Farmers access the **cloud-processed** data via the app, receiving consolidated recommendations for **optimized farm management**

Market Size

Metric	Rural	Urban
TAM	~54 Cr	~1.5 Cr
SAM	~17 Cr	~0.9 Cr
SOM	~2.8 Cr	~0.3 Cr

44,500 Cr

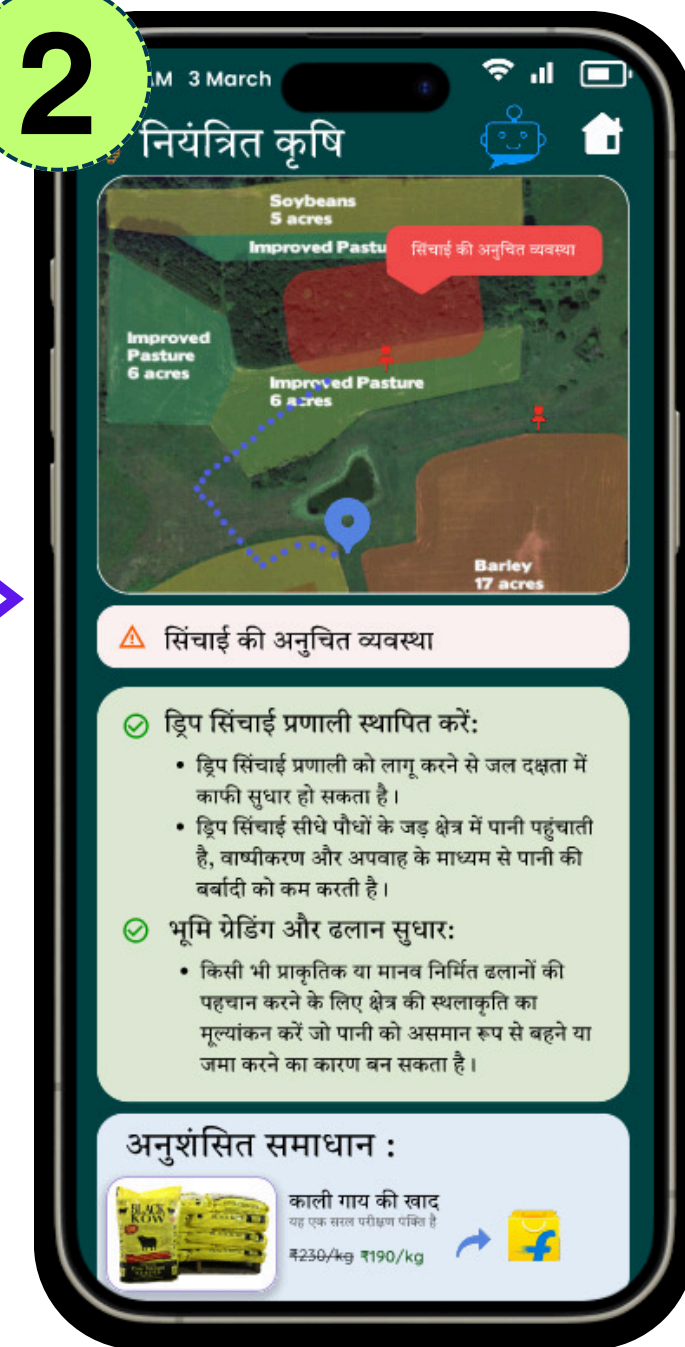
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A Walkthrough Of End-To-End User Journey

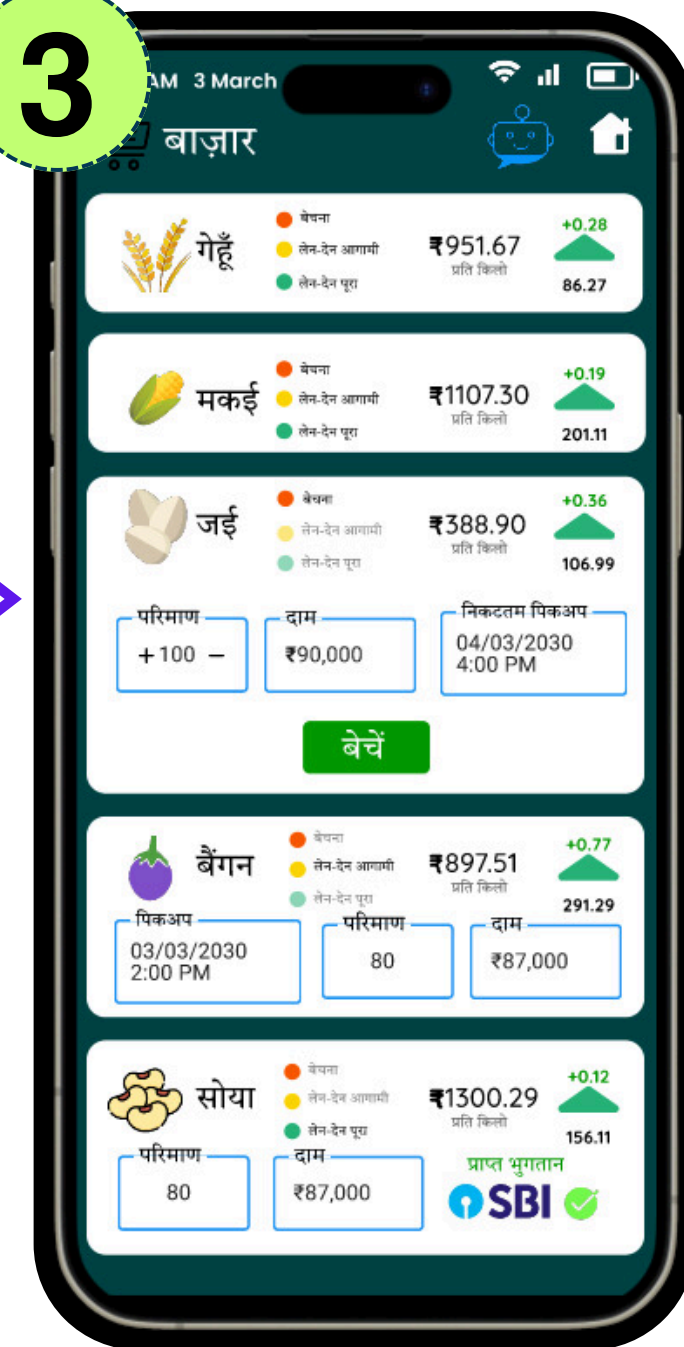
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Onboarding

In 2030, as we steer towards a future of precision farming, our app's onboarding process stands as a beacon of progress for Indian farmers. With multiple sensors installed on tractors and the promise of real-time data at their fingertips, it's a game-changer. But the true brilliance lies in addressing the existing language and literacy barriers.

By offering very intuitive, multilingual onboarding, we break down these walls. The result? A remarkable **60%** reduction in churn rate, as farmers across the country adopt technology which empowers them, optimizing resource use, enhancing crop yield, and paving the way for sustainable agri. landscape. **It's not just an app; it's a transformation.**

[Link to Figma Prototype](#)



Use case

Our multilingual onboarding caters to India's **linguistic diversity**, enhancing **user retention** by **35%** and ensuring seamless access to data for **70%** of **non-English-speaking farmers**

Our 'Precision Agritech' feature, utilizing DeepVision, GPS, and IoT, enhances **weed detection** precision by **80%**, reducing **herbicide use** by **50%**, and increasing crop yield by **30%** for sustainable farming

We leverage the e-commerce supply chain to gain **real time pricing data** for the crops leading to elimination middlemen increasing **profitability** by **150%** and decreasing **lead time** to **30%**.

The AI enabled weather system suggests appropriate irrigation and harvest leading to **35% less** consumption of water, and decreases **spoilage** of harvest upto **20%** by integrating **crop health** and ambient weather conditions.

Problem



Deep Dive



Solution Device



App Integration



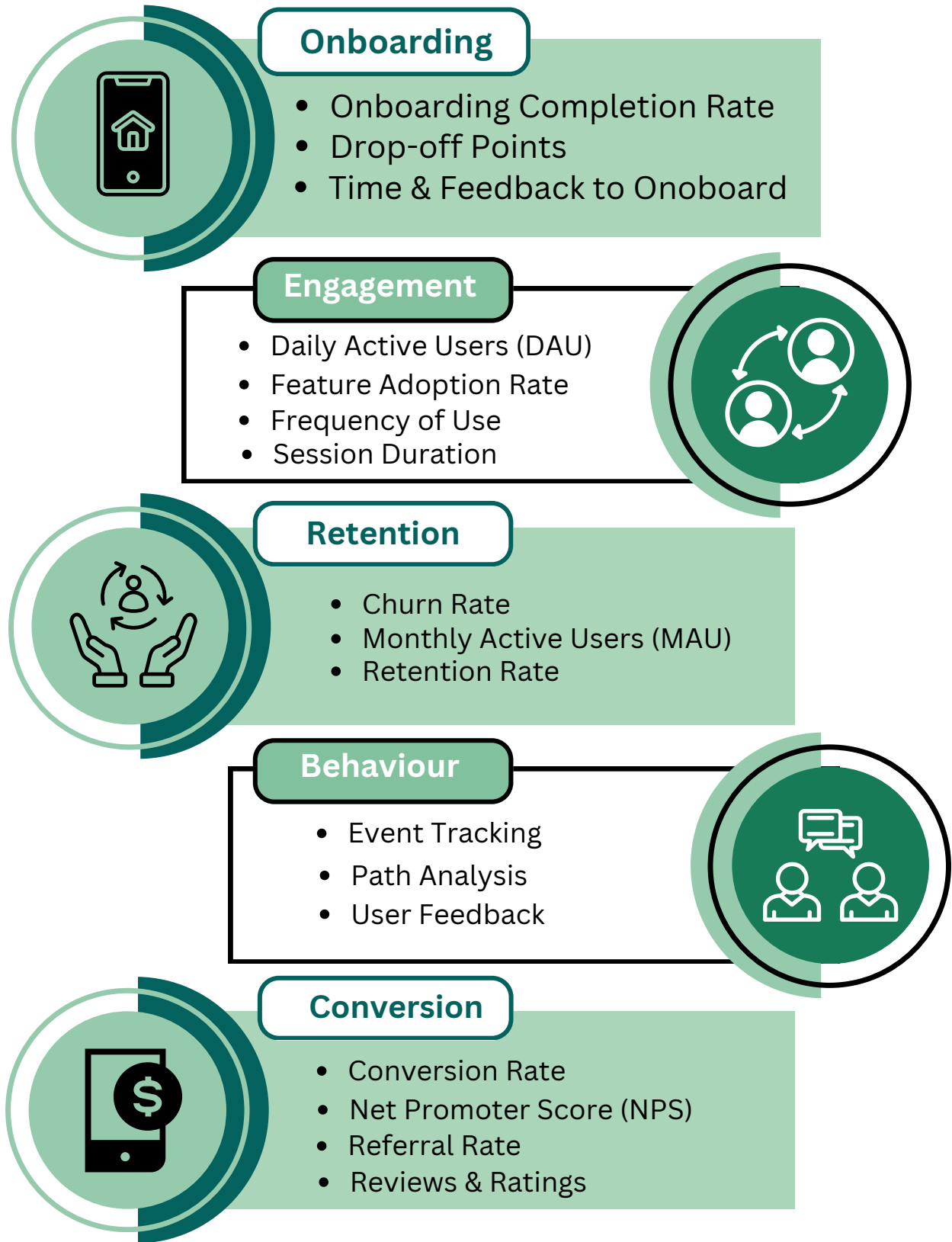
User Journey



Metrics and Pitfall

Just to be on the Ball

Success Metrics with User Journey



Risk Analysis

Pitfall	Severity	Probability	Potential Workarounds
Reluctance to Adopt New Technology			On-ground workshops, demonstrations, partnering with local influencers, and offering trials
Data Privacy Concerns			Strong data encryption using Blockchain, clear privacy policies, and user education on data handling
Internet Connectivity Issues in Rural Areas			Offline app functionalities, data syncing when online, and collaborations with telecom companies for coverage
High Initial Costs for Farmer			Flexible pricing models, subsidies, partnerships with government agricultural programs, or EMI options

We address the limited access to real-time agricultural data, modern market insights, and user-friendly technological solutions for Indian farmers. This solution, rooted in a top-down approach to innovation, leads to efficient practices, saving crop from losses, and financial stability