

TEAM HYPRA

IDEATHON 2.0 | FLAGSHIP INNOVATION CHALLENGE

Team Leader - Himanshu Kumar(22IT3016)

Team Members - Yash Verma(22IT3059)

-Ranjan Kumar Pandit(22IT3037)

-Krishanu Mishra (22IT3020)

-Anushka Nema (22IT3008)

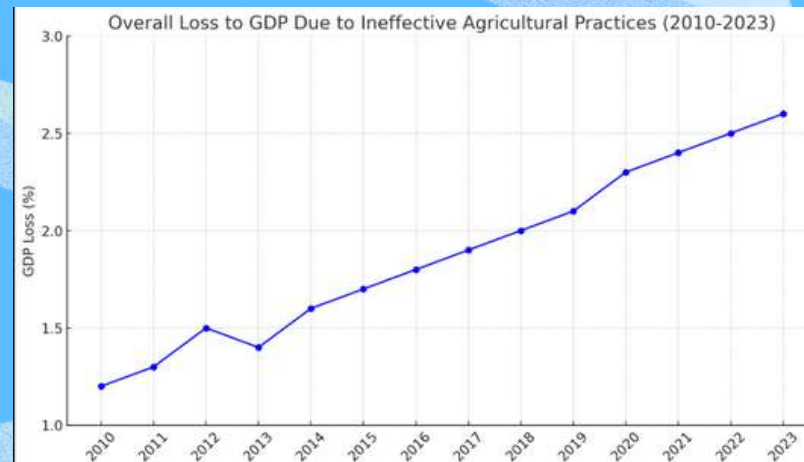


PROBLEM STATEMENT

CHALLENGES FACED BY FARMERS:

- **Monitoring from Anywhere:** Farmers find it difficult to keep track of their crops and fields when they're not on-site, which makes it hard to make quick decisions and manage their farms effectively.
- **Crop Planning:** Farmers often plant crops without knowing what their neighbors are planting, leading to oversupply or redundant crops in the region.
- **Logistics Coordination:** Coordinating transportation for harvesting and planting can be challenging, as farmers often lack visibility into truck availability and scheduling.

HOW BIG IS THE PROBLEM



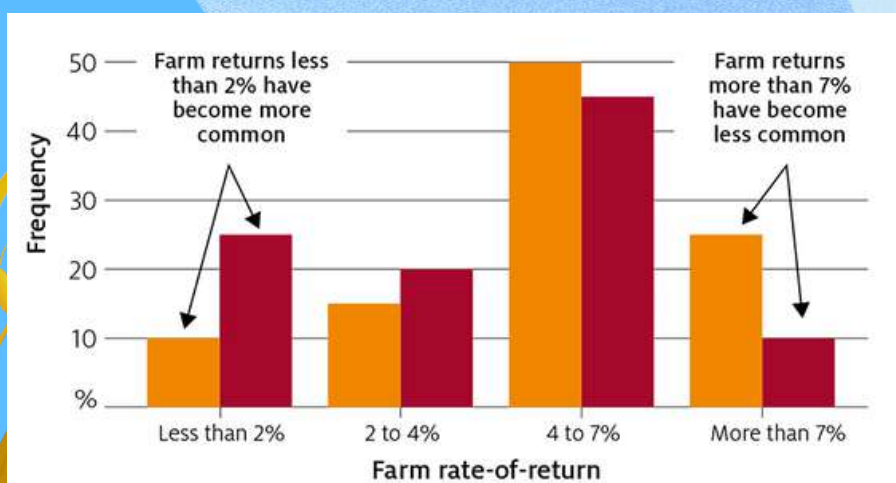
OVERALL LOSS TO GDP DUE TO INEFFECTIVE AGRICULTURE PRACTICES

Rs 92,651 crore per year

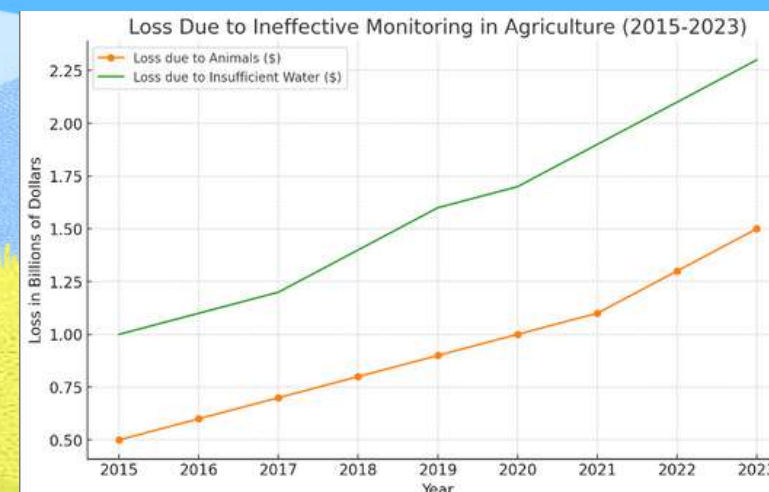
Indian farmers incur **Rs 92,651 crore per year** in post-harvest losses, the primary causes of which are poor storage and transportation facilities.

Poor post-harvest storage, transportation facilities to cost farmers ...
www.downtoearth.org.in/news/agriculture/poor-post-harvest-storage-transport...

LOSSES DUE TO POOR TRANSPORTATION



LOSSES DUE TO OVERPRODUCTION OF PARTICULAR TYPE OF CROPS



LOSSES DUE TO INEFFECTIVE MONITORING OF CROPS

- In a survey of 100 farmers in Uttar Pradesh and Bihar, and 75% reported frequent crop damage due to wild animals, with an average estimated loss of ₹50,000 per year per farmer
- According to an ICAR study, wildlife such as wild boars and monkeys cause an average of 20% yield loss annually in several Indian states, translating to millions of rupees in losses.
- The agri-tech sector in India is projected to grow at a CAGR of 18% from 2020 to 2025, reflecting increasing adoption of technology among farmers.
- The IAMAI reports that smartphone penetration in rural India is at 45%, providing a robust platform for deploying mobile-based solutions. The agri-tech market is expected to grow to \$24 billion by 2025, indicating strong potential for technological interventions.
- According to AMAI, smartphone use in rural India is on the rise. While the exact percentage might be lower than 70%, mobile apps are becoming an increasingly viable tool for reaching farmers.

PROPOSED SOLUTION

REMOTE ACCESS

- Develop a mobile app and a web portal where users can log in and view the latest satellite images of their fields.
- Implement a system to notify users about important changes or events detected in the imagery

SATELLITE IMAGIARY:

- Obtain high-resolution images of fields from satellite providers.
- Use APIs provided by satellite companies to access images

DATA ANALYTICS:

- Obtain high-resolution images of fields from satellite providers.
- Use APIs provided by satellite companies to access images.

SECURITY:

- Ensure secure access to the satellite images and data.
- Use encryption for data transmission and storage.



HOW TO IMPLEMENT THE SOLUTION

1. SATELLITE IMAGERY PROVIDERS:

- Identify and collaborate with satellite imagery providers like Planet Labs, DigitalGlobe, or Sentinel Hub.
- Obtain access to their APIs to fetch images of the specific geographic areas corresponding to users' fields.

2. SOFTWARE DEVELOPMENT:

- Backend Server: Use cloud services like AWS, Azure, or Google Cloud to host the server.
- Implement a backend system that handles requests for satellite images, processes these images, and manages user authentication.
- Mobile App and Website: Develop a mobile app and a web portal for users to interact with the system.
- Ensure the app and website are user-friendly and provide clear and informative views of the fields.

3. INTEGRATION AND ANALYTICS

- Image Processing: Use tools like OpenCV and libraries like TensorFlow or PyTorch to process and analyze the satellite images.
- Machine Learning Models: Develop models to detect crop health issues, growth stages, and other relevant metrics.
- Weather Integration: Use APIs from weather services to integrate weather data and provide forecasts.

4. SECURITY MEASURES:

- Implement user authentication using secure protocols (OAuth2, JWT).
- Use HTTPS for secure data transmission and encrypt sensitive data in storage.

SMART CROP PLANNING AND MONITORING

FARMER RECOMMENDATIONS

- Crop Suggestions: Provide farmers with recommendations on which crops to plant based on current crop distribution and market demand.
- Alerts and Notifications: Send alerts if a particular crop is being overplanted or if there is a high demand for a different crop.

CROP ENTRY SYSTEM

- Farmers input the type of crops they are planting into a mobile app or web portal.
- Real-Time Data Collection: Collect data on crops planted in different areas to provide an overview of crop distribution

DATA ANALYSIS AND INSIGHTS

- Crop Distribution Analysis: Analyze the data to determine the distribution of different crops across the region.
- Supply Prediction: Use machine learning to predict potential oversupply or undersupply of specific crops.

MARKET INTEGRATION

- Market demand and price :Data to give farmers insights into which crops are likely to be more profitable.
- Sales Optimization: Help farmers optimize their crop choices to maximize profitability and reduce waste.

SMART TRANSPORTATION COORDINATION FOR FARMERS

Transportation Booking System

Farmers can book transport slots in advance via a mobile app or web portal, with transport scheduled based on these bookings for efficient pickups.

Real-Time Updates

The app shows real-time transport availability and sends notifications when transport is arriving, keeping farmers informed and ready.

Centralized Transport Coordination

Routes are optimized to serve multiple farmers in one trip, allowing cost sharing by grouping produce in a single transport.

Extended Reach and Profitability

Transport facilities reach distant markets, helping farmers avoid local market saturation and secure better prices, increasing their earnings.



IMPLEMENTATION STEPS

- Create a mobile app and web portal using Flutter/React Native and React/Angular.
- Implement backend systems with Node.js or Python/Django.
- Use PostgreSQL or MongoDB for data storage and management

- Utilize data analytics and machine learning tools (TensorFlow, PyTorch) for processing and analyzing crop data.
- Develop dashboards to visualize crop distribution patterns and market insights.

- Build an AI-driven recommendation engine to suggest optimal crops based on data analysis.
- Set up a notification system for sending push notifications and alerts to farmers.

- Integrate APIs to access real-time market price and demand data.
- Provide actionable insights on crop profitability to assist farmers in decision-making





THANK YOU!