



# SmartCrop Innovators

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*Harnessing Data for Agricultural Growth*

## Solution Overview :

- AI analyzes historical climate data, weather forecasts, and soil conditions to recommend crop selection, planting times, and resource allocation based on predicted weather patterns.
- Helps farmers adapt to a changing climate by optimizing farming practices.

## How is it different from existing ideas?

- Integrates multiple data sources (climate data, soil conditions, weather forecasts) for real-time decision-making.
- Tailored recommendations specific to local conditions and crop types.

## How does it solve the problem?

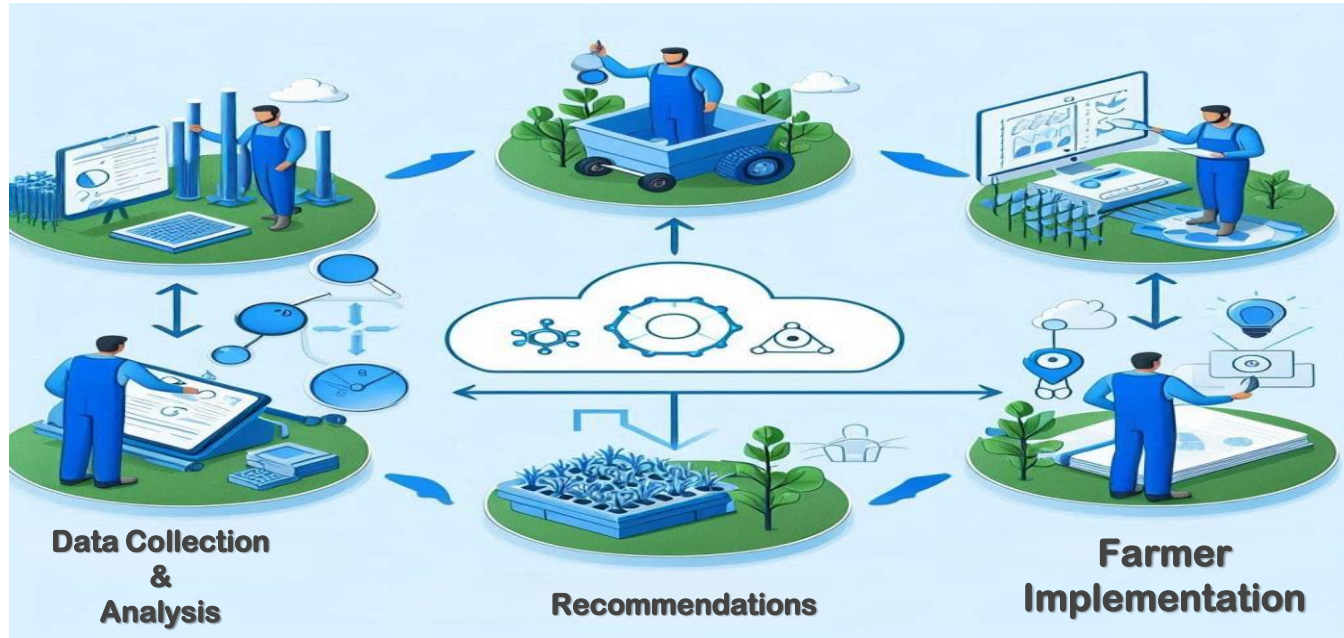
- Provides actionable insights that can directly impact crop yield and resource efficiency.

## USP (Unique Selling Proposition):

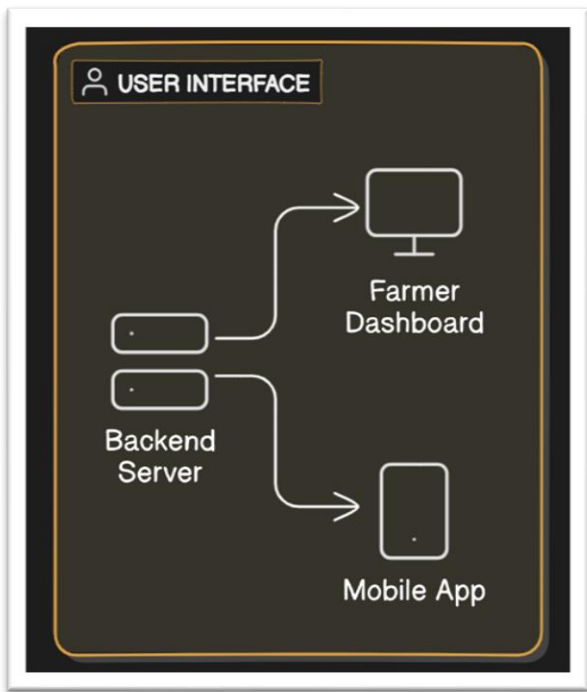
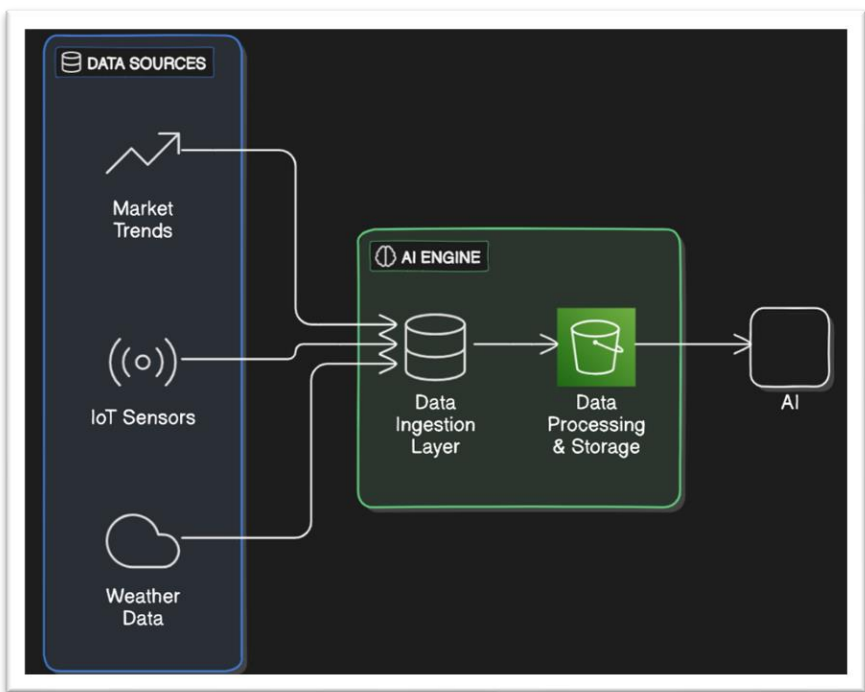
- AI-driven, real-time, adaptive recommendations that enhance agricultural resilience.

## List of Features Offered by the Solution

- ✓ Real-time data collection and analysis.
- ✓ AI-driven crop selection and planting time recommendations.
- ✓ Resource allocation guidance (water, fertilizers).
- ✓ Integration with IoT devices for monitoring soil and weather conditions.



**Illustrate the process flow from data collection to actionable insights delivered to farmers.**



# Architecture Diagrams

## Technologies to be Used in the Solution

- **AI/ML Algorithms:** For data analysis and prediction.
- **IoT Devices:** For real-time data collection (soil sensors, weather stations).
- **Cloud Computing:** For data storage and processing.
- **Mobile/Web Interface:** For delivering insights to farmers.





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## Farm Dashboard

### Farm Data

Current Location  
Latitude: 22.8817  
Longitude: 88.0152

Temperature: 33.04°C  
Humidity: 61%  
Weather Condition: moderate rain

Select Soil Type Loamy

### Recommended Crops & Plants

#### Cereal

##### 1. Maize (Corn)

Water Requirements: 500-700 L

##### 2. Pearl Millet (Bajra)

Water Requirements: 200-400 L

##### 3. Finger Millet (Ragi)

Water Requirements: 300-500 L

### Seasonal Crops & Plants

#### Cereal

##### 1. Maize (Corn)

Water Requirements: 500-700 L  
Temperature: 20-30°C  
Soil pH Level: 5.6-7.0  
Planting Dates: April-May  
Harvesting Dates: August-September  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

##### 2. Sorghum (Jowar)

Water Requirements: 300-500 L  
Temperature: 25-30°C  
Soil pH Level: 6.0-7.5  
Planting Dates: June-July  
Harvesting Dates: November-December  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

##### 3. Pearl Millet (Bajra)

Water Requirements: 200-400 L  
Temperature: 25-30°C  
Soil pH Level: 6.0-7.0  
Planting Dates: June-July  
Harvesting Dates: November-December  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

##### 4. Finger Millet (Ragi)

Water Requirements: 300-500 L  
Temperature: 20-30°C  
Soil pH Level: 5.6-6.5  
Planting Dates: July-August  
Harvesting Dates: January-February  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

##### 5. Rye

Water Requirements: 400-600 L  
Temperature: 10-15°C  
Soil pH Level: 6.0-7.0  
Planting Dates: August-September  
Harvesting Dates: May-June  
Irrigation Schedules: Every 2-3 weeks  
Fertilizer Schedules: Every 6-8 weeks

## Recommended Crops & Plants

### Cereal

#### 1. Maize (Corn)

Water Requirements: 500-700 L  
Temperature: 20-30°C  
Soil pH Level: 5.6-7.0  
Planting Dates: April-May  
Harvesting Dates: August-September  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 2. Pearl Millet (Bajra)

Water Requirements: 200-400 L  
Temperature: 25-35°C  
Soil pH Level: 6.0-7.0  
Planting Dates: June-July  
Harvesting Dates: November-December  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 3. Finger Millet (Ragi)

Water Requirements: 300-500 L  
Temperature: 20-30°C  
Soil pH Level: 5.6-6.5  
Planting Dates: July-August  
Harvesting Dates: January-February  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

### Legume

#### 1. Black Gram (Urad)

Water Requirements: 200-400 L  
Temperature: 25-30°C  
Soil pH Level: 6.0-7.0  
Planting Dates: June-July  
Harvesting Dates: October-November

#### 2. Kidney Beans (Rajma)

Water Requirements: 300-500 L  
Temperature: 20-30°C  
Soil pH Level: 6.0-7.0  
Planting Dates: May-June  
Harvesting Dates: September-October

#### 3. Soybean

Water Requirements: 300-500 L  
Temperature: 20-30°C  
Soil pH Level: 6.0-7.0  
Planting Dates: May-June  
Harvesting Dates: October-November

Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 13. Indian Violet (Kalanchoe)

Water Requirements: 200-300 L  
Temperature: 15-25°C  
Soil pH Level: 6.0-7.0  
Planting Dates: March-April  
Harvesting Dates: September-October  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 14. Maranta (Prayer Plant)

Water Requirements: 200-300 L  
Temperature: 20-30°C  
Soil pH Level: 6.0-7.0  
Planting Dates: March-April  
Harvesting Dates: September-October  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 15. Calendula (Marigold)

Water Requirements: 200-400 L  
Temperature: 15-25°C  
Soil pH Level: 6.0-7.0  
Planting Dates: August-September  
Harvesting Dates: March-April  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 16. Elderflower

Water Requirements: 300-500 L  
Temperature: 15-25°C  
Soil pH Level: 6.0-7.0  
Planting Dates: April-May  
Harvesting Dates: September-October  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

#### 17. Chamomile

Water Requirements: 200-400 L  
Temperature: 15-25°C  
Soil pH Level: 6.0-7.0  
Planting Dates: March-April  
Harvesting Dates: September-October  
Irrigation Schedules: Every 1-2 weeks  
Fertilizer Schedules: Every 4-6 weeks

Snapshots of the prototype



## Prototype Performance Report/Benchmarking

- **Recommendation Accuracy:**
  - Crop selection: **85%**
  - Planting times: **90%**
- **Resource Efficiency:**
  - Water usage may reduced by **25%**
  - Fertilizer may optimization by **15%**
- **Response Time:**
  - Data processing: **<1 seconds**
  - Dashboard updates: **<1 second**
- **Scalability:**
  - **Designed to handle up to 1,000 concurrent users efficiently** with the current setup.
  - **Potential to scale up to 10,000 users** with infrastructure upgrades and optimizations.
- **User Feedback:**
  - **Not provided to the users**

# Future Plans

- **Expand Data Sources:**
  - Integrate additional data sources, including real-time soil conditions and more advanced sensors, to enhance the accuracy of recommendations.
- **Refine AI Algorithms:**
  - Continuously improve AI models to increase the precision of crop and resource management recommendations.
- **Regional Scaling:**
  - Scale the solution to cover more geographical regions, adapting to local climate and soil conditions.
- **Utilize Historical Data:**
  - Leverage a larger dataset of historical climate and crop data to identify long-term patterns and trends.
- **Incorporate Real-time Market Trends:**
  - Integrate real-time market data to provide farmers with up-to-date pricing and demand forecasts, optimizing their decisions for better profitability.



# Important links:

- ✓ GitHub Public Repository - <https://github.com/md-shahid-ansari/ai-driven-farm.git>
- ✓ Demo Video Link (3 Minutes) - [https://github.com/md-shahid-ansari/ai-driven-farm/blob/main/prototype\\_demo\\_video.mp4](https://github.com/md-shahid-ansari/ai-driven-farm/blob/main/prototype_demo_video.mp4)
- ✓ Final Product Link - <https://md-shahid-ansari.github.io/ai-driven-farm/>



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Total Cash Prize Worth **INR 1.75 Lakhs**

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