🧠 Project Title

AI Krishi Mitra – An AI-powered Assistant for Sustainable & Resilient Rural Farming

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👥 Team Name

KrishiTech Innovators

(You can change this, but keep it rural + tech aligned)

👤 Team Leader Name

Abhisekh Yadav

🧩 Problem Statement

Rural farmers face three major challenges:

1. **Lack of timely and reliable agricultural knowledge** in their local language
2. **Unpredictable climate and weather disasters** causing crop losses
3. **Unfair market access**, where farmers do not get the best mandi prices

These challenges reduce productivity, income, and long-term sustainability of rural ecosystems.

💡 Brief About the Idea

AI Krishi Mitra is a unified AI-powered platform designed to **educate, protect, and empower farmers**.

The solution provides:

- A **local-language AI assistant** (chat/voice) for crop education, Q&A, and crop health detection
- **AI-based weather disaster alerts** to reduce climate-related risks
- **AI-driven mandi price intelligence** using MCP to help farmers sell their produce at the best possible rates

The platform is accessible through **mobile apps, SMS, and voice-based interfaces**, ensuring inclusivity for rural users.

🚀 How Is This Different From Existing Solutions?

Most existing solutions solve **only one problem** (either advisory, weather, or pricing).

Our Differentiation:

- ✅ **End-to-end lifecycle support**: From sowing → protection → selling
- ✅ **Agentic AI architecture** (multiple AI agents working together)
- ✅ **Local language + voice-first approach**
- ✅ **MCP-based real-time mandi price aggregation**
- ✅ **Low-cost, scalable, and inclusive**

➡️ This makes AI Krishi Mitra a **complete rural decision-support system**, not just an app.

🎯 How Will It Solve the Problem?

- Farmers get **instant, trusted guidance** in their own language
- **Early weather disaster alerts** help them take preventive action

- **Market intelligence** increases income by reducing dependency on middlemen
- Data-driven decisions improve **sustainability and resilience**

🌟 USP (Unique Selling Proposition)

- **One platform – three critical solutions**
- **Voice + chat support for low literacy users**
- **AI + MCP-powered mandi intelligence**
- **Climate-aware farming recommendations**
- **Highly scalable and government-friendly architecture**

🛠️ Features Offered by the Solution

1️⃣ AI Farming Assistant

- Multilingual chat & voice support
- Crop education & best practices
- Fertilizer, irrigation, and pest Q&A

2️⃣ Crop Health Detection

- Image-based disease detection
- Treatment & prevention suggestions

3️⃣ Weather Disaster Alert System

- AI-based detection of floods, droughts, heatwaves
- Alerts via SMS / notifications

4️⃣ Smart Mandi Price Finder

- Best nearby mandi rates
- Transport-aware profit suggestion
- AI price trend prediction

(Add simple icons/illustrations for each feature in PPT)

🔄 Process Flow / Use Case Diagram (Text Explanation)

1. Farmer interacts via chat, voice, or image
2. Request is routed to the AI Gateway
3. Relevant AI agent is triggered:
    - Agri Assistant Agent
    - Weather Intelligence Agent
    - Market Intelligence Agent
4. AI processes data using models + RAG + MCP
5. Result is delivered via SMS / App / Voice

🧱 Architecture Diagram (Text Description)

- **Frontend**: Mobile/Web App, Voice Interface

- **Backend**: Spring Boot + Spring AI
- **AI Layer**:
    - LLM for Q&A
    - Vision model for crop health
    - Time-series ML for weather
    - MCP for mandi price aggregation
- **Data Layer**:
    - Weather APIs
    - Government agri datasets
    - Mandi price sources
- **Notification Layer**:
    - SMS / WhatsApp / Push notifications

🧪 Wireframes / Mock Diagrams (Optional Content)

- Home screen with 3 options:
    - Ask Krishi Mitra
    - Check Weather Alerts
    - Find Best Mandi Price
- Image upload screen for crop disease
- Mandi comparison screen with map/list view

(Even hand-drawn wireframes are acceptable)

🧰 Technologies to Be Used

Backend & AI

- Spring Boot
- Spring AI
- LangChain
- MCP (Model Context Protocol)

AI Models

- LLM (for chat & reasoning)
- CNN / Vision Model (crop disease)
- Time-series ML (weather forecasting)

Communication

- SMS Gateway
- Push Notifications
- WhatsApp API

Data Sources

- Weather APIs
- Government agriculture datasets
- Mandi price feeds

💰 Estimated Implementation Cost (Optional)

- Cloud infrastructure: Low to Medium
- AI APIs (LLM, Vision): Pay-per-use
- SMS alerts: Minimal per user

➡️ **Affordable and scalable for large rural adoption**

🌍 Long-Term Societal Value

- Improved farmer income
- Reduced crop losses
- Better water & resource usage
- Climate-resilient rural ecosystems
- Supports national sustainability goals