SMART INDIA HACKATHON 2025

TITLE PAGE

- **Problem Statement ID – SIH25010**
- **Problem Statement Title- Smart Crop Advisory System for Small and Marginal Farmers**
- **Theme- Agriculture, FoodTech & Rural Development**
- **PS Category- Software**
- **Team Name – gpt-coders**

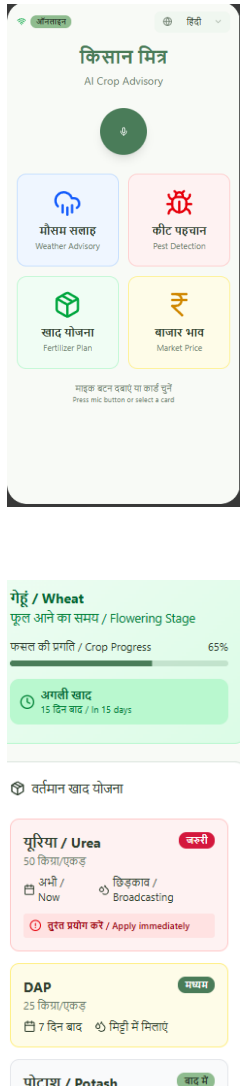
gpt-coders

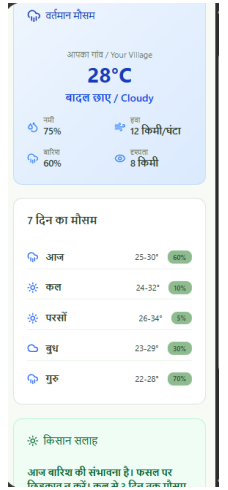
IDEA TITLE

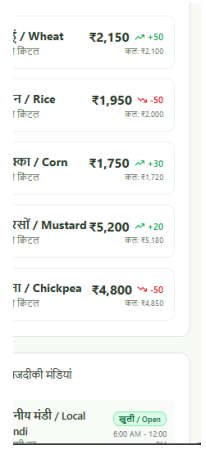
SMART INDIA HACKATHON 2025

Proposed Solution

- Voice-first app in 8+ Indian languages for easy farmer adoption.
- AI pest detection & treatment guidance (offline-capable).
- Climate-smart alerts for irrigation, spray, and weather risk prevention.
- Mandi price intelligence → compare mandis, recommend best selling option.
- Designed for scalability → supports millions via microservices + Bhashini API.







gpt-coders

TECHNICAL APPROACH

SMART INDIA HACKATHON 2025

- **Frontend**: React Native / Flutter (Android App), PWA for offline support.
- **Voice & NLP**: Bhashini API, Whisper/Vosk for ASR/TTS.
- **AI Models**: TensorFlow Lite for pest detection, Gradient Boosting for crop recommendations.
- **OCR**: Tesseract for Soil Health Card scanning.
- **Backend**: FastAPI, PostgreSQL, Redis, Docker/Kubernetes for scaling.
- **Notifications**: FCM for push alerts, Gupshup/Twilio for SMS.

Technology stack

gpt-coders

FlowChart

SMART INDIA HACKATHON 2025

gpt-coders

FEASIBILITY AND VIABILITY

SMART INDIA HACKATHON 2025

- **High Feasibility:**
  - 70–80% smartphone penetration & proven AI models (97% pest detection accuracy).
  - Govt. support: Digital Agri Mission, eNAM, Bhashini API.

- **Challenges:**
  - Low digital literacy & poor connectivity.
  - Regional language diversity & data gaps.

- **Solutions:**
  - **Voice-first UX** (ASR/TTS in 8+ languages).
  - **Edge AI** for offline pest detection; SMS & IVR fallback.
  - **Phased rollout** (8 crops → 50+), KVK partnerships for validation.

gpt-coders

IMPACT AND BENEFITS

SMART INDIA HACKATHON 2025

Impact

- **Target:** 121M small & marginal farmers.
- **Yield improvement:** +10–15% with AI advisory.
- **Crop loss reduction:** -15–20% via climate alerts.
- **Cost savings:** -25–40% on fertilizers & pesticides.
- **Income boost:** +10–15% through mandi price intelligence.

Benefits

- **Social:** Digital inclusion for low-literate farmers (voice-first).
- **Economic:** Higher income, lower dependency on middlemen.
- **Environmental:** Reduced pesticide misuse, better soil health, sustainable farming.

gpt-coders

RESEARCH AND REFERENCES

SMART INDIA HACKATHON 2025

- NABARD Census 2023: 85% small/marginal farmers, 41% receive expert advice
- IIIT Allahabad: 97% crop disease AI accuracy (CVGG-16 model)
- World Bank 2022: 23% rural digital literacy, 90% farmers prefer voice over text
- Digital Agriculture Mission 2024: ₹2,817 crore government support
- Tamil AI Voicebot Study: 91% recognition accuracy, effective for low-literacy users
- Plantix Case: 12M+ Indian users, 8-language support, 85%+ AI detection accuracy