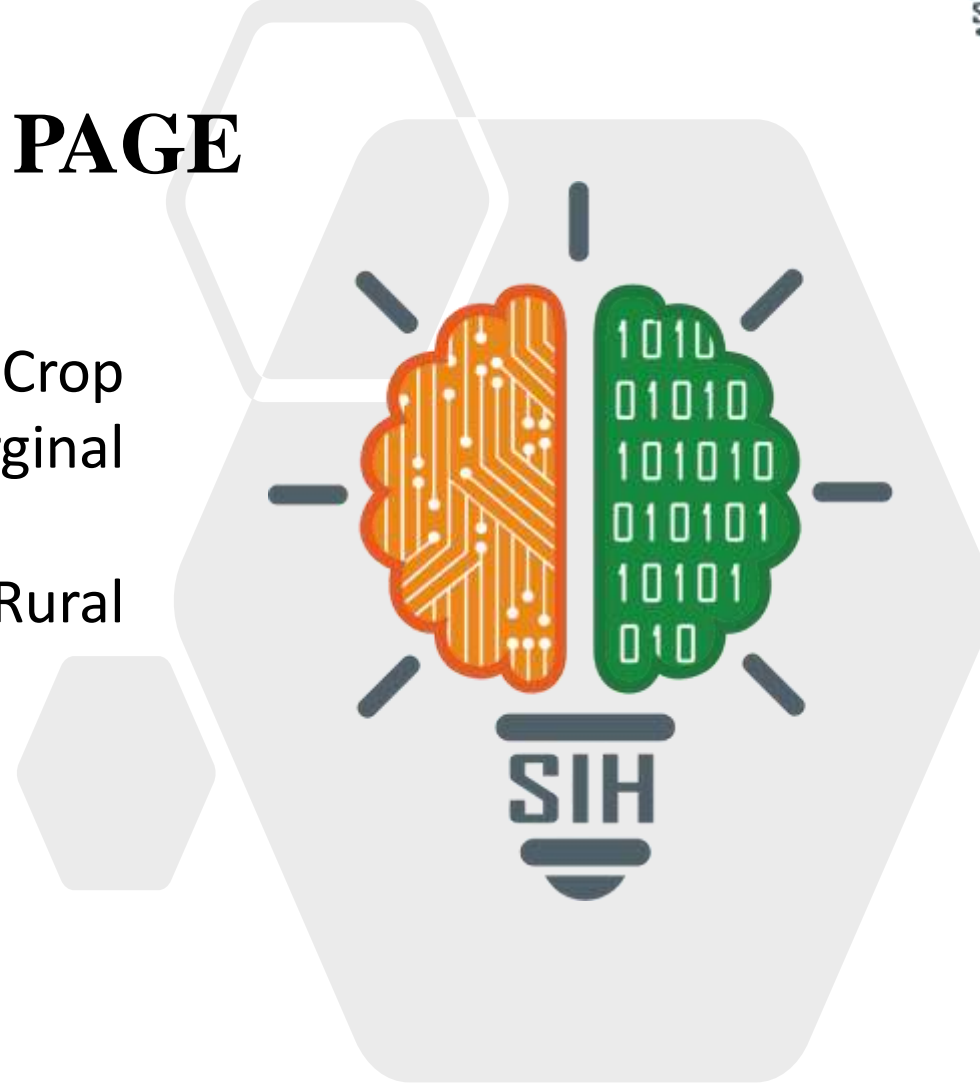


# SMART INDIA HACKATHON 2025



## TITLE PAGE

- **Problem Statement ID** – 25010
- **Problem Statement Title**- Smart Crop Advisory System for Small and Marginal Farmers
- **Theme**- Agriculture, FoodTech & Rural Development
- **PS Category**- Software
- **Team ID** - 81146
- **Team Name** : vyava sahayam



## Smart Crop Advisory System for Small and Marginal Farmers

### ❖ Solution

- **. Inefficient Crop Selection**
  - Crop choices are made without scientific guidance, mostly by guesswork
  - **AI-driven advisory** suggests best crops using soil & climate data.
- **. Unpredictable Weather Risks**
  - Sudden droughts, floods, and heatwaves damage crops.
  - **Real-time weather alerts** and irrigation scheduling prevent crop loss.
- **. Pest & Disease Attacks**
  - Farmers can't detect infestations early, causing heavy losses.
  - **AI-powered pest detection** and preventive remedies reduce damage.
- **. Market Price Instability**
  - Farmers sell crops to middlemen at low rates.
  - **Market intelligence system** provides real-time price trends & selling guidance.
- **. Lack of Easy Access to Help & Government Support**
  - Farmers struggle to use existing apps because they are difficult and not available in local languages.
  - A **voice-based platform in local languages**, with SMS updates and government scheme information, makes it simple and useful for every farmer.

**1 Frontend**  
React Native+React js ,Tailwind CSS,react -i18next, Web Speech API,  
Google Translate API.

**2 Backend**  
Node.js, Express.js / Python Flask, Django

**3 Database**  
PostgreSQL, MongoDB

**4 AI/ML**  
Python, TensorFlow, scikit-  
learn, PyTorch, HuggingFace

**5 Integrations**  
OpenWeatherMap API, Twilio/Exotel,  
Govt Open Data APIs

## ◆ Feasibility

- **Proven Tech Stack** – Open-source (React, MySQL, Node.js, TensorFlow)
- **Offline-first PWA** – works even with low connectivity
- **Scalable Microservices** – modular, easily extendable
- **Govt. APIs & Data Sources** – weather, mandi prices, soil health

## ◆ Challenges

- **Low digital literacy** among small farmers
- **Poor rural internet coverage**
- **Trust gap** with AI-based recommendations

## ◆ Mitigation Strategies

- **Voice-enabled chatbot** in local languages
- **SMS / IVR / WhatsApp fallback** for non-smartphone users
- **Pilot projects with NGOs & farmer cooperatives** to build trust
- **Lightweight app design** for 2G/3G networks

## For Farmers

- **20–30% increase in yield** (proven by ICT studies)
- **Reduced input costs** – optimized fertilizer & pesticide use
- **Better income** – real-time mandi price awareness
- **Empowerment** – self-reliance instead of guesswork

## Social Benefits

- **Improved livelihoods** for small & marginal farmers
- **Community adoption** via cooperatives & NGOs
- **Knowledge access in local languages** → digital inclusion

## Environmental Benefits

- **Reduced chemical overuse** → healthier soil & crops
- **Optimized water use** via weather-based planning
- **Supports sustainable farming practices**

## Supporting Data & Studies

**NABARD Report 2022 -**

<https://www.nabard.org/content.aspx?id=23>

**FAO ICT in Agriculture -**

<https://www.fao.org/3/i7994e/i7994e.pdf>

- Works best for documentation/report (10-12 pages).
- Adds transparency since evaluators can verify data.
- Looks more research-oriented & academic.

## Technical References

**AI for Pest/Disease Detection**

- TensorFlow - [tensorflow.org](https://www.tensorflow.org)
- PyTorch - [pytorch.org](https://pytorch.org)

**Multilingual Voice Chatbot**

- Indic NLP Library - [indic\\_nlp\\_library](https://indicnlp.github.io)
- Google api- [cloud.google.com/speech-to-text](https://cloud.google.com/speech-to-text)
- Google Developers - [web.dev](https://web.dev)
- Node.js - [nodejs.org](https://nodejs.org)