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# CAPSTONE PROJECT

## AI KHETI SATHI AGENT

**Presented By: SHRISTI SHARMA**  
**Student name : SHRISTI SHARMA**  
**College Name & Department : UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA –B.Tech(CSE)**

# OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications

# PROBLEM STATEMENT

- Small and marginal farmers lack access to timely, accurate, and location-specific agricultural information — such as weather, crop choices, pest control, and market prices — in a language they understand. This knowledge gap leads to poor farming decisions, crop losses, and reduced income.
- **Proposed Solution:**  
An AI-powered Smart Farming Agent that uses Natural Language Processing (NLP) and Retrieval-Augmented Generation (RAG) to deliver real-time, location-specific agricultural advice to small and marginal farmers.
- The agent retrieves trusted information from government sources, weather services, and agritech platforms to provide guidance on:
  - Suitable crops based on soil, season, and weather
  - Pest and disease management (organic and chemical)
  - Fertilizer and irrigation recommendations
  - Current mandi (market) prices
  - Weather forecasts
- Farmers can interact in their local languages, ask natural questions, and receive simple, actionable advice, helping them make informed decisions that reduce risk and increase yield and income.

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# TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

Retrieval Augmented Generation (RAG)

IBM Granite model

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## IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

## **WOW FACTORS** – *AI AGENT FOR SMART FARMING ADVICE*

This agent empowers grassroots farmers with AI, providing real-time, localized, and multilingual farming advice that was previously inaccessible or difficult to understand.

It bridges the digital divide and helps farmers make better, data-backed decisions that directly impact productivity, income, and sustainability.

### **Unique features:**

Multilingual support (Hindi, Marathi, etc.)

Location-based mandi prices, crop advice, and weather

Pest & fertilizer recommendations using local data

RAG-powered retrieval from a custom knowledge base

Natural language Q&A with simple, farmer-friendly responses

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## END USERS

- Small and marginal farmers
- Krishi Vigyan Kendras (KVKs) and local agri extension workers
- Agri-input dealers who assist farmers
- Agri-tech students or educators working on rural outreach

# RESULTS

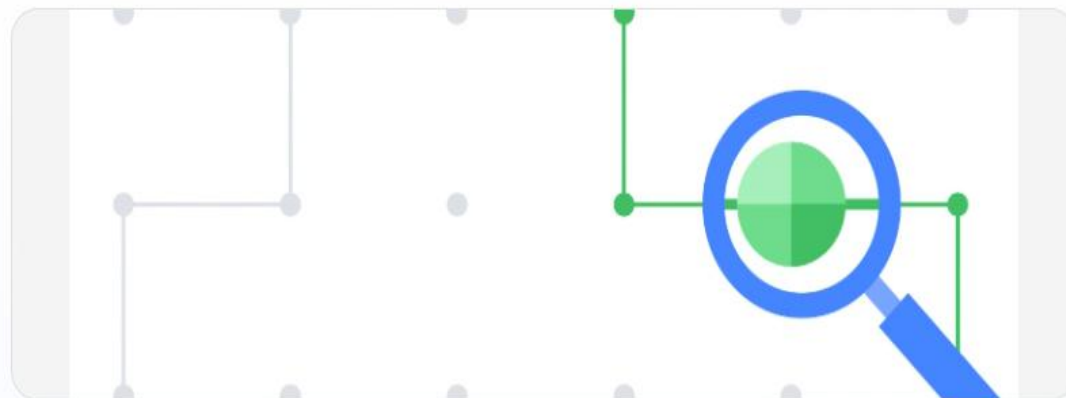
## Agent preview



AI Kheti Sathi 11:34 AM

Welcome to AI Kheti Sathi

Farming made smart, multilingual AI Buddy for your Farming related queries



## Sample questions

What crop should I grow in my region this season?



How do I control pests in my crops?



Type something...





# RESULTS

## Agent preview

SS You: 11:35 AM

What crop is best for this season?

AI Kheti Sathi 11:35 AM

To provide the best crop recommendation, I need to know your location and the current season there. However, considering it's currently the kharif season in most parts of India, suitable crops include rice, maize, bajra (pearl millet), soybean, and cotton. Please share your district for a more precise suggestion. 🌾

► How did I get this answer?



Type something...

I



## Agent preview

SS You: 11:35 AM

how can i cultivate rice in west bengal?

AI Kheti Sathi 11:35 AM

Yes, rice can be cultivated successfully in West Bengal during the Kharif season. Here's how:

- **Soil:** Loamy or clayey soil with good water retention
- **Time:** June to July (Kharif season)
- **Varieties:** Swarna, IR64, MTU-1010
- **Fertilizer:** Apply Urea, DAP, MOP in correct doses
- **Irrigation:** Keep field flooded for early growth
- **Pests:** Use neem spray or Triazophos for stem borer
- **Harvest:** 90–120 days based on variety

► Would you like help finding seed suppliers or mandi rates in West Bengal?

► How did I get this answer?



Type something...



# RESULTS

## Agent preview

AI Kheti Sathi 11:35 AM

To provide the best crop recommendation, I need to know your location and the current season there. However, considering it's currently the kharif season in most parts of India, suitable crops include rice, maize, bajra (pearl millet), soybean, and cotton. Please share your district for a more precise suggestion. 🌾

► How did I get this answer?

You: 11:37 AM

What crop is best for loamy soil this season?

AI Kheti Sathi 11:37 AM

For loamy soil, which is moderately fertile and retentive, crops like wheat, gram, and barley do well during the rabi season. In the kharif season, you could consider maize or soybean. Remember, local weather conditions also play a crucial role. For a more tailored recommendation, please share your district. 💧 🌾

► How did I get this answer?



Type something...



## Agent preview

You: 11:45 AM

How do I control pests in my crops?

AI Kheti Sathi 11:45 AM

🦋 Pest control is crucial for a healthy crop. Here are some organic and chemical methods to control pests:

### Organic Methods:

- Use neem oil or soap solution to repel pests
- Introduce natural predators like ladybugs or lacewings
- Practice crop rotation and sanitation
- Use physical barriers like fine mesh or fine netting

### Chemical Methods:

- Use insecticides like Triazophos or Chlorpyrifos
- Apply fungicides like Carbendazim or Mancozeb for fungal diseases
- Use herbicides like Glyphosate or 2,4-D for weeds

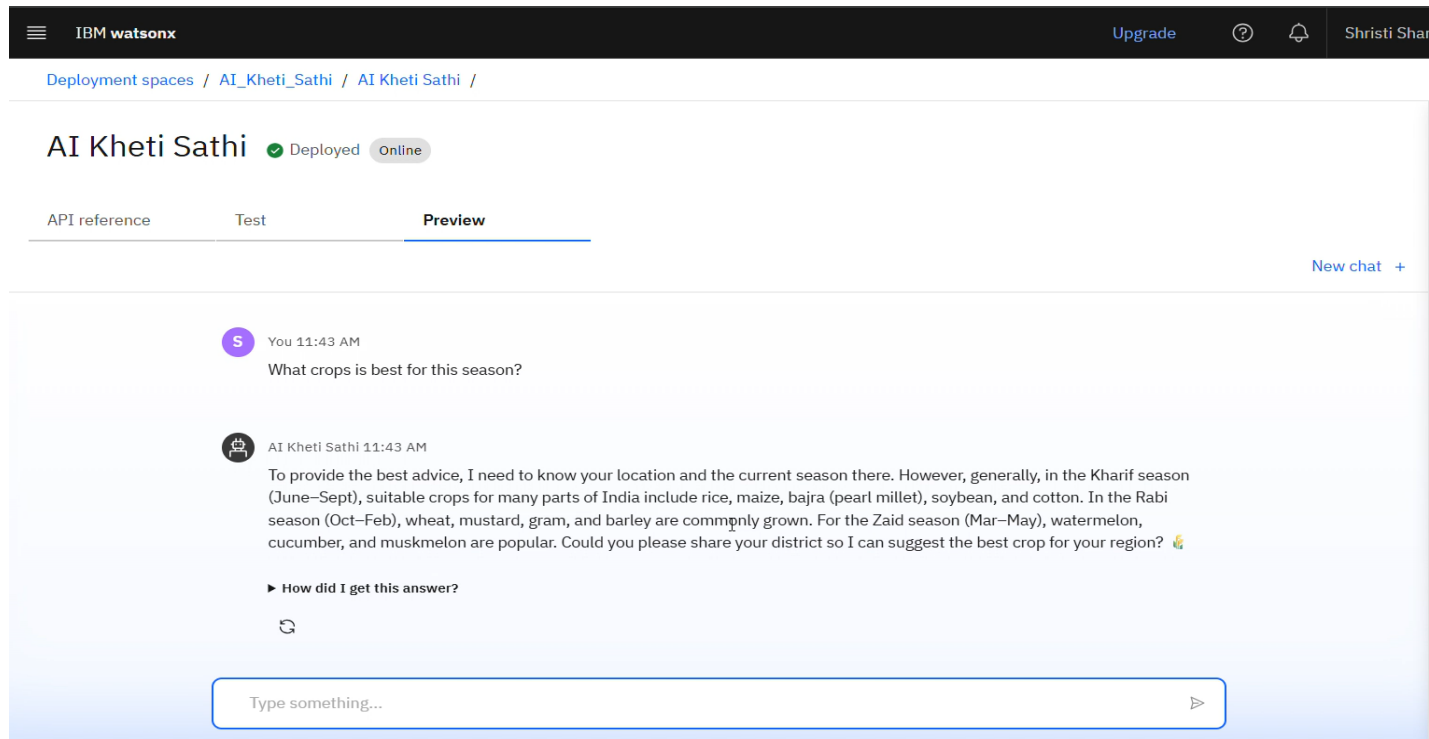
☀️ Always read the label and follow instructions carefully before using any chemical. Also,

Type something...



# RESULTS

## Deployed AI Agent



The screenshot displays the IBM watsonx interface for the AI Kheti Sathi agent. The top navigation bar includes the IBM watsonx logo, an 'Upgrade' button, and user information 'Shristi Shar'. Below the navigation bar, the breadcrumb trail reads 'Deployment spaces / AI\_Kheti\_Sathi / AI Kheti Sathi /'. The main heading is 'AI Kheti Sathi', followed by status indicators 'Deployed' (with a green checkmark) and 'Online' (in a grey pill). Three tabs are visible: 'API reference', 'Test', and 'Preview' (which is active). A 'New chat +' button is located on the right. The chat history shows a user query at 11:43 AM: 'What crops is best for this season?'. The AI agent's response at 11:43 AM provides general advice based on the Kharif (June–Sept) and Rabi (Oct–Feb) seasons, listing common crops like rice, maize, bajra, soybean, cotton, wheat, mustard, gram, and barley. It also mentions Zaid season crops (Mar–May) like watermelon, cucumber, and muskmelon, and asks for the user's district for more specific recommendations. Below the response is a link '► How did I get this answer?' and a refresh icon. At the bottom is a text input field with the placeholder 'Type something...' and a send button.

IBM watsonx Upgrade ? Shristi Shar

Deployment spaces / AI\_Kheti\_Sathi / AI Kheti Sathi /

AI Kheti Sathi ✓ Deployed Online

API reference Test **Preview**

New chat +

**S** You 11:43 AM  
What crops is best for this season?

**AI Kheti Sathi** 11:43 AM  
To provide the best advice, I need to know your location and the current season there. However, generally, in the Kharif season (June–Sept), suitable crops for many parts of India include rice, maize, bajra (pearl millet), soybean, and cotton. In the Rabi season (Oct–Feb), wheat, mustard, gram, and barley are commonly grown. For the Zaid season (Mar–May), watermelon, cucumber, and muskmelon are popular. Could you please share your district so I can suggest the best crop for your region? 🌱

► How did I get this answer?

↻

Type something...

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## CONCLUSION

- The AI agent delivers real-time, location-specific advice on crops, pests, fertilizers, and mandi prices.
- It uses RAG-based retrieval to provide accurate, data-driven guidance from trusted sources.
- Designed for multilingual and simple interaction, making it accessible to small and marginal farmers.
- Helps improve yield, reduce risks, and boost farmer income, promoting smart and sustainable agriculture.

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## GITHUB LINK

- GitHub Link: [https://github.com/shristi005/AI\\_Kheti\\_Sathi](https://github.com/shristi005/AI_Kheti_Sathi)

# FUTURE SCOPE

- Voice support in local languages
- Offline or low-data mode
- Live weather API integration
- Use of satellite/IoT data
- Crop disease detection via AI
- Auto-generated farm reports
- Link to agri-experts/helplines

# IBM CERTIFICATIONS

CREDLY CERTIFICATE( GETTING STARTED WITH AI)



## RAG LAB CERTIFICATE

7/26/25, 10:40 PM

Completion Certificate | SkillsBuild

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Shristi Sharma

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 26 Jul 2025 (GMT)

**Learning hours:** 20 mins





**THANK YOU**