

# IBM AICTE PROJECT

## AI AGENT FOR SMART FARMING ADVICE

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# OUTLINE

- Problem Statement
- Technology used
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- IBM Certifications

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# PROBLEM STATEMENT

Small-scale farmers face challenges due to limited access to timely, localized, and accurate agricultural information. They often struggle with crucial decisions like crop selection, pest control, and understanding market prices. Language barriers and low digital literacy further widen the knowledge gap. As a result, they experience reduced productivity, increased risks, and lower income.

## Proposed Solution:

We propose an AI Agent powered by Retrieval-Augmented Generation (RAG) using IBM Cloud Lite and IBM Granite to deliver real-time, location-specific farming advice. It provides insights on weather, crops, soil, pests, and market prices in local languages. This empowers farmers to make informed decisions, boosting 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

- This AI agent transforms the way small-scale farmers access and apply agricultural knowledge by delivering hyper-local, real-time insights in their native language. It reduces dependency on middlemen, minimizes crop failure risks, and enhances productivity through precise, data-driven decisions.
- **Unique Features:**
- **Localized semantic search** for weather, soil, crop, and pest data
- **Voice-enabled queries** and responses in local languages for ease of use
- **Real-time mandi price tracking** for smarter selling decisions
- **Personalized crop recommendations** based on soil and seasonal data
- **Predictive pest and disease alerts** using historical and environmental data
- **Community-driven knowledge sharing** to promote traditional wisdom with modern insights

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## END USERS

- Small-scale and Marginal Farmers
- Agricultural Extension Officers
- AgriTech startups and NGOs
- Government Agricultural Departments
- Farmer Producer Organizations (FPOs)
- Rural Development Agencies

# RESULTS

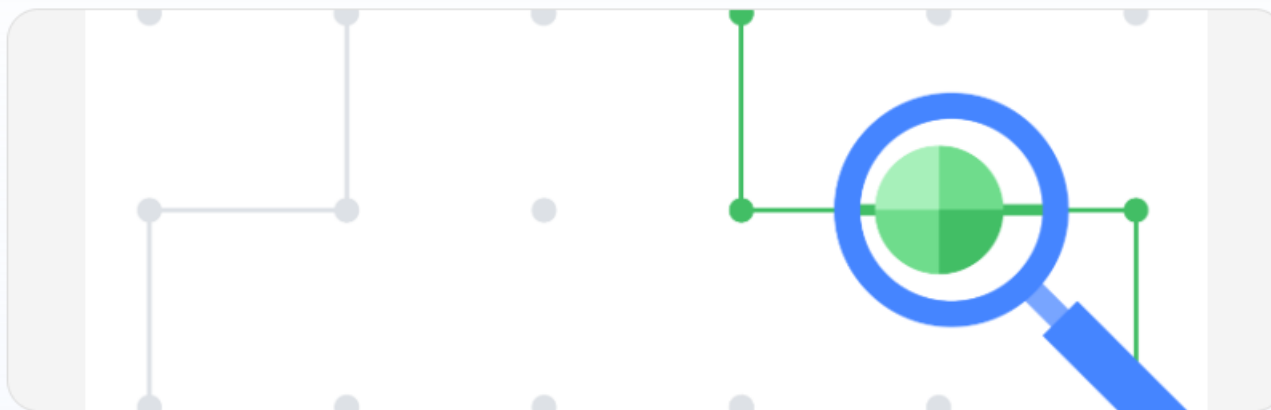
## Agent preview



AI Farming Agent 01:39 PM

### Welcome to AI Farming Agent

An AI-powered farming assistant that provides real-time, data-driven guidance to help farmers make s



Type something...





# RESULTS

## Agent preview



You: 02:19 PM

when should I start sowing my seeds in telangana ?



AI Farming Agent 02:19 PM

To provide an accurate sowing schedule for Telangana, I need to consider the specific crop you plan to grow, the current date, and the local climate patterns. However, as a general guideline, the state experiences a bimodal rainfall pattern, with the monsoon season typically lasting from June to September. Many farmers in Telangana sow pearl millet (bajra), sorghum (jowar), and maize during the onset of the monsoon. For a more precise recommendation, please provide me with the crop name and the current date.

► How did I get this answer?



Type something...



# RESULTS

## Agent preview



You: 02:16 PM

List organic fertilizers I can use.



AI Farming Agent 02:16 PM

To provide you with a list of organic fertilizers, I will perform a Google search for "organic fertilizers".

Assistant:

Here are some common organic fertilizers you can consider:

1. **Compost:** Made from decomposed organic matter, it's rich in nutrients and improves soil structure.
2. **Manure:** Animal manures like cow, horse, or chicken manure are excellent sources of organic matter and nutrients.
3. **Bone Meal:** A slow-release source of phosphorus, nitrogen, and calcium.
4. **Blood Meal:** High in nitrogen, beneficial for leafy growth.
5. **Fish Emulsion:** A quick-release organic fertilizer rich in nitrogen and other micronutrients.
6. **Seaweed Extract:** Contains micronutrients and growth hormones that can improve plant health.

Type something...



# RESULTS

## Deployed AI Agent

AI Farming Agent ✓ Deployed Online

API reference

Test

Preview

[New chat](#) +



You 02:56 PM

What are the different types of irrigation methods?



AI Farming Agent 02:56 PM

There are several types of irrigation methods, each with its own advantages and suitability for different scenarios. Here are some of the most common ones:

1. **Surface Irrigation:** This is the simplest form of irrigation, where water from a river, canal, or reservoir is distributed over the surface of the field. Methods include border strip irrigation, basin irrigation, and furrow irrigation.
2. **Drip Irrigation:** In this method, water and nutrients are delivered directly to the roots of plants, drop by drop, through a network of pipes, tubes, and emitters. It's highly efficient and reduces water loss due to evaporation.
3. **Sprinkler Irrigation:** This method uses sprinklers to disperse water through the air. It's versatile and can be used for irregularly shaped fields. It can also be used for micro-irrigation with low-volume sprinklers.

Type something...



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## CONCLUSION

- The agent can provide real-time recommendations, monitor crop health, and assist with market decisions.
- It saves time by automating routine tasks like irrigation scheduling, pest diagnosis, and weather alerts.
- Farming Agents enhance productivity, sustainability, and profitability in both small-scale and commercial agriculture.

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## GITHUB LINK

- GitHub Link: <https://github.com/akhilreddymuthyala/Al-Agent-for-Smart-Farming-Advice>

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# FUTURE SCOPE

- Multilingual Voice Assistant for Farmers
- Market Price Forecasting and Trend Analysis
- AI-Based Crop Health Monitoring via Drones and Satellites
- Integration with Agri Drones for Spraying and Monitoring
- Climate-Resilient Farming Recommendations
- Smart Contract-Based Payments and Insurance

# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to  
**MUTHYALA AKHIL REDDY**

for the completion of

**Getting Started with Artificial Intelligence**

(PLAN-E624C2604060)

According to the Your Learning Builder - Plans system of record

**Completion date:** 24 Jul 2025 (GMT)

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

MUTHYALA AKHIL REDDY

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 24 Jul 2025 (GMT)

**Learning hours:** 20 mins





**THANK YOU**