

# Drought Impact Detection

# Objectives

- **Drought Impact Detection and provide real-time guidance to farmers for its implications for agriculture.**

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# Technologies

- Machine Learning Models for Detection
- LangChain & OpenAI's GPT model
- HTML, CSS, Bootstrap and JavaScript for frontend development

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# Workflow

- Train ML models using a dataset containing weather and soil parameters for drought Detection
- Selection of the best model one on the basis of accuracy
- Testing of model of selected model

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# Workflow Continued ...

- **Pass all input parameters to LLM via LangChain to get contextual responses and guidance ready for user queries**
- **Develop simple frontend using HTML/CSS/JS and bootstrap**
- **Use FastAPI to bridge frontend and backend functionalities**
- **[Optional] Deploy the chatbot on a hosting service.**

# Final Look

## Drought Impact Detection



Surface Pressure (PS)	8
Specific Humidity at 2 Meter (QV2M)	765
Temperature at 2 Meters (T2M)	77.8
Temperature Range at 2 Meters (T2MDEW)	23
Maximum Temperature at 2 Meters (T2M_MAX)	54
Minimum Temperature at 2 Meters (T2M_MIN)	6
Temperature Range at 2 Meters (T2M_RANGE)	76
Earth Skin Temperature (TS)	87
Wind Speed at 10 Meters (WS10M)	98.6
Wind Speed Range at 10 Meters (WS10M_RANGE)	45
Wind Speed at 50 Meters (WS50M)	65
Maximum Wind Speed at 50 Meters (WS50M_MAX)	34
Wind Speed Range at 50 Meters (WS50M_RANGE)	8
Year	2008
Date	22

Predict

Prediction Result:



Abnormally Dry .

You: Hi, I am growing rice, is it good weather to grow?

Chatbot: Based on the provided input parameters and the prediction of drought being 0 (Abnormally Dry), it seems like the weather conditions are currently suitable for growing rice. However, it is important to note that weather conditions can change, and it is always a good idea to monitor the weather regularly for any updates or changes.

To further mitigate the effects of drought and protect your rice crops, here are some practical strategies and advice:

1. **Irrigation Management:** Proper irrigation is crucial for rice cultivation. Monitor the soil moisture levels regularly and adjust irrigation accordingly. Implement efficient irrigation techniques such as drip irrigation or alternate wetting and drying (AWD) to conserve water.
2. **Mulching:** Apply a layer of organic mulch around the rice plants to reduce evaporation and conserve soil moisture. This can help retain moisture in the soil and reduce water requirements.
3. **Crop Rotation:** Consider implementing crop rotation practices to break the cycle of pests and diseases that can be exacerbated by drought conditions. Rotate rice with drought-tolerant crops to maintain soil health and reduce water stress on the rice plants.
4. **Soil Management:** Improve soil health and water-holding capacity by incorporating organic matter into the soil. This can be done through the addition of compost or cover crops. Healthy soil with good water retention properties can help the rice plants withstand drought conditions.

Type your message...

Send



# Benefits to Farmers

- Drought Detection and guidance enable farmers to plan and manage their crops effectively, minimizing damage during dry periods.
- Farmers can conserve vital resources like water by optimizing irrigation practices, contributing to sustainable agriculture.
- By implementing recommended strategies, farmers can reduce crop losses and ensure more stable income.
- Drought Detections aid in financial planning, allowing farmers to secure insurance, loans, and subsidies to offset potential losses.

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# Future Steps

- **Expand training data for**
- **Integrate local agricultural practices as source material for the LLM using LangChain**
- **Deploy in plot regions for real-world validation**

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**Thank you  
& Welcome**