📄 Smart Agriculture IoT Concept – AI Future Directions

1. IoT Sensors Required

Sensor Type	Purpose
Soil Moisture Sensor	Measures water content in soil
Temperature Sensor	Monitors air temperature
Humidity Sensor	Monitors environmental moisture levels
Light Sensor (LDR)	Measures sunlight intensity
pH Sensor	Measures soil acidity/alkalinity
Rain Sensor	Detects rainfall to avoid overwatering

2. Proposed AI Model: Crop Yield Prediction

- **Model Type**: Random Forest Regressor
- **Input Features**:
  - Soil moisture (%)
  - Average temperature (°C)
  - Humidity (%)
  - pH level
  - Sunlight (lux)
  - Rainfall (mm)
- **Output**: Estimated crop yield (kg per acre)

[Sensors]

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[Microcontroller (e.g., Arduino/Raspberry Pi)]

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[Data Preprocessing & Storage (Local/Cloud)]

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[AI Model (Deployed in Cloud or Edge device)]

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[Yield Prediction / Action Recommendations]

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[Farmer Dashboard / Mobile App]

4. Concept Proposal Summary

SmartAgri AI: An IoT-Driven Crop Yield Prediction System
 The SmartAgri AI system uses a network of IoT sensors and a machine learning model to optimize crop production. It gathers real-time environmental data such as soil moisture, sunlight, and rainfall, which is processed locally or in the cloud.

A Random Forest model predicts expected crop yield and recommends actions like irrigation or fertilization. The results are visualized in a user-friendly dashboard, helping farmers make informed decisions.

Benefits:

- Early warnings on low-yield risks
- Optimized irrigation and fertilization
- Reduced resource wastage
- Enhanced food security and sustainability