SMART AGRICULTURAL SYSTEM

An AI-IoT Integrated Concept Proposal

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Introduction

This proposal outlines the development of a smart agriculture system utilizing AI and IoT. The goal is to enable precision farming, optimize resource use, and improve crop yield predictions for sustainable and intelligent agricultural practices.

IoT Sensors Table

Sensor	Function
Soil Moisture Sensor	Manages irrigation needs based on water levels
Temperature Sensor	Monitors soil and ambient air temperature
Humidity Sensor	Tracks humidity for weather and disease models
Light/UV Sensor	Assesses sunlight for crop productivity
pH Sensor	Measures soil acidity for nutrient balance
CO_2 Sensor	Evaluates plant respiration/photosynthesis
Rainfall Sensor	Detects precipitation for irrigation decisions

AI Model Proposal

- **Model Type:** Hybrid approach (Both Random Forest Regressor and LSTM (Time-Series))
- **Inputs:** Historical sensor data, weather, crop type, soil properties
- **Output:** Crop yield forecast (tons/hectare),**weather forecasting**, **growth cycles**, or **sensor trends over time**
- **Advantages:** Accurate, adaptive with seasonal data, nonlinear pattern recognition

Benefits Summary

- Enables real-time monitoring and decision-making
- Reduces over-irrigation and fertilizer waste
- Improves yield prediction and food security
- Scales across different crop types and region.

SMART AGRICULTURAL SYSTEM DATA FLOW DIAGRAM
An AI-IoT Integrated Concept

Field Sensors

(IOT Sensors)

Edge Device (Raspberry Pi)

AI Model (Cloud)

Farmer Dashboard
(Mobile App)