Title: AI-Powered Smart Agriculture System

Author: Pauline Onyango

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Problem Statement

Farmers often rely on manual observation and seasonal experience to manage crops. This leads to inefficient irrigation, delayed disease detection, and unpredictable yields. A smart system is needed to monitor crop conditions in real-time and optimize decisions automatically.

Proposed System

I propose an AI-driven IoT system that collects environmental data from farm fields and uses machine learning to predict crop health, irrigation needs, and yield potential. The system will notify farmers in real-time via a mobile dashboard or SMS alerts.

Sensors Needed

- Temperature sensor (e.g., DHT22) – for ambient conditions
- Soil moisture sensor – for irrigation needs
- Humidity sensor – for plant transpiration
- Light sensor – for sunlight exposure
- Camera sensor – for visual crop analysis (e.g., disease detection)

AI Model

A regression or classification model trained on historical sensor and yield data to:

i. Predict optimal irrigation timing
ii. Estimate crop yield
iii. Detect signs of disease from image data (CNN-based)

Output

i. Real-time dashboard (mobile or web)
ii. SMS/WhatsApp alerts (e.g., “Water maize section A now”)
iii. Weekly reports on growth/yield prediction

Benefits

1. Saves water and fertilizer
2. Boosts yield predictions
3. Enables early disease detection
4. Reduces manual labor

Smart Agriculture Data Flow Diagram