Problem Statement 13: AI-Assisted Precision Irrigation Monitoring System

The Challenge

Inefficient irrigation practices lead to water wastage, crop stress, and reduced productivity.
Farmers often lack continuous insights into soil moisture dynamics and crop water
requirements. Manual irrigation decisions may not adapt to changing weather and soil
conditions. There is a need for an intelligent assistive system that can analyze irrigation-related
data and support water-efficient farming practices.

Soil & Weather Data Analysis Agent

An agent that processes soil moisture, evapotranspiration data, rainfall, and crop growth stages
into irrigation-relevant insights.

Water Stress Detection Agent

An agent that identifies under-irrigation or over-irrigation patterns using historical and seasonal
baselines.

Irrigation Advisory Assistant

An agent that provides water-efficiency and scheduling insights
(assistive only, non-automated control).

Outcome

Promotes efficient water use, reduces resource wastage, and supports sustainable irrigation
practices.

Mandatory Tech Stack

Lang Flow using IBM Granite Model
(Using RAG on irrigation guidelines and sustainable water management frameworks)