

Aavishkar

Inter-Collegiate / Institute / Department Research Convention

Category:

Slot No.:

Level:

Farmer's Corner: AI powered and Simulation based agricultural recommendation and monitoring system

Introduction

Indian agriculture faces critical challenges such as water scarcity, low productivity, and limited access to scientific guidance. Small and marginal farmers rely heavily on traditional knowledge leading to avoidable losses.

This project aims to bridge this gap by integrating AI models, data-driven analytics, and farmer-owned digital tools into a unified support system.

References

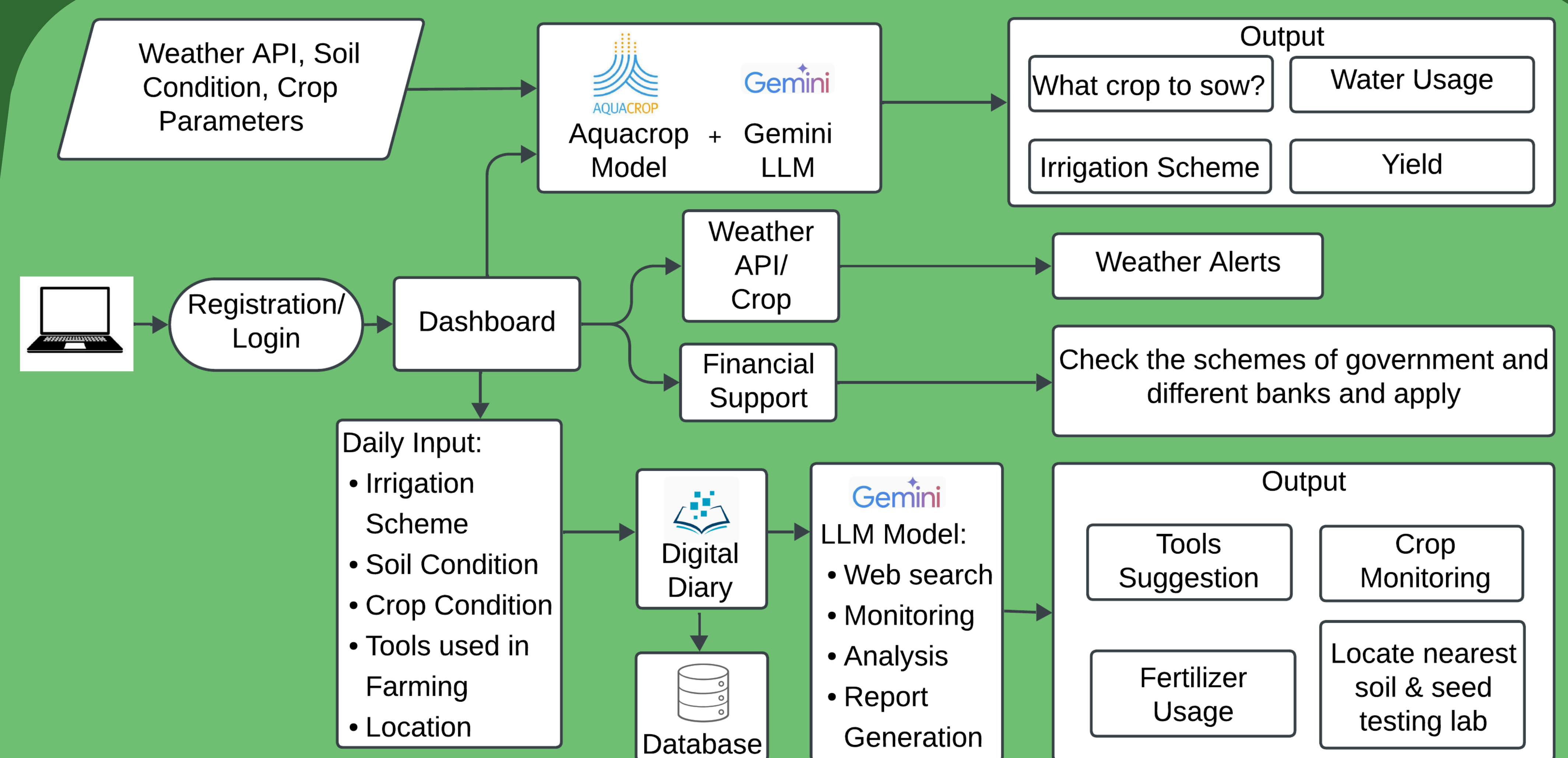
- FAO AquaCrop Model Documentation
- Research articles on AI-driven crop prediction and irrigation optimization
- Indian Government Agriculture Portals (Soil Health Card, IMD Weather)
- Studies on transformer-based models for crop & climate analytics

Aim

To build a system that gives personalized farming guidance to boost productivity, reduce risks, and support sustainable farming practices.

Objectives

- Analyze weather, soil, and crop using AquaCrop and LLM-based models.
- Recommend optimal crop selection, irrigation schedules and water planning.
- Guide farmers to relevant government schemes and financial support.



Flowchart

Research Methodology

1. Data Collection
 - Weather, soil conditions, crop parameters, and farmer inputs are gathered into a central database.
2. Model Processing
 - AquaCrop simulates crop growth, irrigation needs, and yield, while a LLM analyzes farmer inputs and identifies risks.
3. Decision Outputs
 - The system provides crop choice, irrigation schedules, yield estimates, and scheme suggestions.

Expected Impact

- 20–40% reduction in water wastage
- 10–25% reduction in operational cost
- Improved decision-making and climate resilience
- Increased access to government schemes
- Support for small and marginal farmers