**Abstract:**

The agricultural sector faces significant challenges in optimizing crop yield and resource utilization due to varying environmental conditions. This project presents the development of an AI and IoT-based crop recommendation system aimed at enhancing decision-making for farmers. By integrating real-time sensor data with advanced machine learning techniques, the system provides accurate recommendations for suitable crops to cultivate, based on critical soil and weather parameters, including nitrogen (N), phosphorus (P), potassium (K), rainfall, humidity, temperature, and pH levels.

The system employs a network of sensors deployed across agricultural lands to continuously collect and transmit data via Wi-Fi to a web-based interface. The collected data is stored in a CSV format, enabling historical analysis and the calculation of mean values to improve prediction accuracy. A machine learning model, trained on historical datasets, analyzes the environmental conditions and delivers actionable insights to users.

The web application, designed using HTML, CSS, and Flask, features a user-friendly interface that allows farmers to view real-time sensor data, manually input data, and access crop recommendations. This interactive platform not only facilitates informed decision-making but also empowers farmers to adapt to changing agricultural conditions. Ultimately, the proposed system aims to contribute to sustainable farming practices by optimizing crop selection and enhancing overall agricultural productivity.