

**Smart Agriculture System**

# PROBLEM STATEMENT

Over the years, crop production has degraded due to various environmental factors, such as fluctuations in soil moisture and

temperature. These changes directly impact crop health and yield. Additionally, new-generation farmers struggle with crucial

agricultural decisions, including:

* **Crop Selection**: Farmers lack scientific guidance on which crops are best suited for their soil and climate conditions.
* **Fertilizer Management**: Many farmers are unaware of which fertilizers to use, when to apply them, and in what quantity to maintain soil fertility.
* **Disease Identification & Treatment**: Without expert knowledge, farmers fail to detect crop diseases early, leading to significant yield losses.

# PROJECT OVERVIEW

Agricultural productivity has declined due to changes in soil moisture and temperature, directly impacting crop yield. Additionally,

new-generation farmers face challenges in:

* Choosing the right crop for their soil and climate.
* Selecting and applying fertilizers at the right time.
* Identifying and treating crop diseases without expert guidance.

To address these challenges, this project develops a Smart Farming Assistant that provides data-driven insights to farmers.

* Crop Recommendation – Suggests the best crops based on soil moisture, temperature, and pH.
* Fertilizer Guidance – Recommends which fertilizer to use and when, based on soil health and crop type.
* Disease Detection – Uses image processing to identify plant diseases and provide treatment solutions.

# SOLUTION OFFERED

This project introduces a Smart Farming Assistant to enhance agricultural decision-making through

data-driven insights:

* **Optimal Crop Selection** – Identifies suitable crops based on soil moisture, temperature, and pH levels.
* **Fertilizer Recommendation** – Suggests appropriate fertilizers and application timing based on soil health and crop requirements.
* **Plant Disease Detection** – Utilizes image analysis to detect diseases and recommend effective treatments.

# WHO ARE THE END USERS?

Farmers, Agricultural Experts, Agri-Tech Companies, Government & NGOs, and Agricultural Students & Researchers.

# TECHNOLOGY USED TO SOLVE THE PROBLEM

## Deployment:

Streamlit: Streamlit is used to deploy fertilizer, crop recommendation and plant disease detection using deep learning model.

## 2)Deep Learning:

**PyTorch**: The DL models were trained using PyTorch.