

# **Feasibility Study**

## **1. Technical Feasibility**

- **IoT Hardware:**
  - Soil moisture sensor
  - NPK sensor
  - pH sensor
  - DHT11/DHT22 for temperature & humidity
  - NodeMCU / ESP32 microcontroller
- **Software & Tools:**
  - Frontend: React / HTML / CSS / JavaScript
  - Backend: Node.js / Python
  - Database: MySQL
  - IoT Communication: MQTT / Firebase Realtime DB
- All required hardware and software are readily available, affordable, and compatible.

## **2. Operational Feasibility**

For this project:

### **User Needs Addressed**

- Accurate fertilizer recommendations
- Real-time monitoring of soil health
- Data stored and shown through a clean web interface

### **Operational Benefits**

- Reduces unnecessary fertilizer usage
- Helps maintain soil health
- Saves time and provides instant results
- Easy to use for farmers and agricultural students

## User Adaptability

- Simple interface
- Minimal learning curve
- Well aligned with modern smart-agriculture trends

## 3. Economic Feasibility.

### Hardware (IoT)

Component	Cost (Approx.)
ESP32 / NodeMCU	₹300–₹500
Soil Moisture Sensor	₹100–₹150
NPK Sensor (Generic)	₹2000–₹5000
pH Sensor	₹600–₹1200
Jumper wires + Power supply	₹100

**Total IoT Cost:** ₹3,500 – ₹7,000

- Most software tools are open-source.