

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.