

FIKIRA

INTRODUCTION

The agricultural sector is under a lot of pressure to produce more food as the human population rises to an all time high. To handle this problem the field has to turn to technology to provide it with solutions, these solutions range from technologies to use on the farm to increase yield, to technologies to connect the farmer to buyers therefore increasing sales.

Our project aims to develop technologies that will be used on the farm to increase crop yield, by providing farmers with insight into the nature of their farmland (Soil Management), and automating routine aspects of the farming process.

Project Goals:

- Creation of tools that will help local farmers with their farm activities (i.e soil management).
- Get local farmers to adapt to the tools created above in order to boost their productivity.

Solution Description:

The proposed solution consists of a hardware node that will be partially buried into the ground on the farm. The node is equipped with sensors that send data regarding the state of the farm soil (moisture, soil nutrients, soil composition, e.t.c) and the environment of the farm (temperature, humidity, e.t.c) to a server.

Artificial Intelligence (AI) on the server then uses the data sent by the node to give the farmer insight on his farm and crops. These insights include health monitoring, smart crop selection, water and fertilizer management. The insights are shown to the farmer on a dashboard he can view using his computer or smartphone.

PROJECT RESULTS:

Project Expected Output:

- Functional Hardware node that will collect data regarding the state of the farm soil and the environment and send it to a server.
- A dashboard to display the data collected by the node to the farmer
- A clear plan on how to convert the data collected by node into useful Insight that will help farmers in increasing their crop performance and yield.

The following are possible things that can be achieved using the data collected by the node:

1. Increased Production: Optimized crop treatment such as accurate planting, watering, pesticide application and harvesting directly affects production rates.
2. Water Conservation – Weather predictions and soil moisture sensors allow for water use only when and where needed.
3. Real-Time Data and Production Insight –Farmers can visualize production levels, soilmoisture, sunlight intensity and more in real time and remotely to accelerate the decision making process.
4. Accurate Farm and Field Evaluation –Accurately tracking production rates by field over time allows for detailed predicting of future crop yield value of a farm.
5. Smart Crop Selection (SCS) - which is based on data of metrological and soil factors. These factors include nitrogen, phosphorus, potassium, CO₂, pH, EC, temperature, humidity of soil, and rainfall.
6. Reduced Environmental Footprint – All Conservation efforts such as water usage and increased production per land unit directly affect the environmental footprint positively.
7. Remote Monitoring - Local and commercial farmers can monitor multiple fields in multiple locations around the globe from an internet connection. Decisions can be made in real-time and from anywhere.