



SOIL HEALTH AND CATTLE GRAZE CHECKER

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Abstract—This project is to solve or ease the major problem of farmers all around the globe. This is based on the utilization of a few of the basic sensors to solve the major problems. The problem of cattle herd graze and humidity control will be monitored strictly under this project.

These are still two major problems of farmers if we look at ground level. There are few solutions but none of them is available to them at low or reasonable cost.

Therefore it becomes really important to improvise a ground level solution for them.

A basic but utility project that will be available to all the farmers at a low cost.

I INTRODUCTION

I grew up reading a lot of literary works and one of my favorite authors once composed the most beautiful story around the struggles of a poor farmer. He just fell asleep for a bit and then loses his everything to cattle.

Not intending to get emotional over a work of fiction but just throwing up a light on the most ignored realistic fields. In the age of Jarvis, we propose a very basic yet very useful product that will be both cost as well as environmentally friendly.

This IoT project uses basic sensors like proximity sensors and humidity sensors. A very useful up-gradation will be to upgrade it with a thermostat. This is basically for plant health. If we know about the health of our plants and regulate our actions that way, it'll be great for the crops and in turn for the farmers.

Imagine having an alarm that wakes you up before the danger reaches the crop and now continues reading

about this imagination, shaping itself into a vital project.

II LITERATURE SURVEY

Recently in 2019, Elsevier B.V. published a paper on intelligent farming methods. They used multiple sensors and data analysis tools. ESP32s Node MCU, breadboard, DHT11 Temperature, and Humidity Sensor, Soil Moisture Sensor, SI1145 Digital UV Index / IR / Visible Light Sensor, Jumper wires, LEDs are the major components of the project. This is one of the great ideas as it focuses on the conservation of resources while monitoring soil health.

It works on developing an alert system that would give notifications to farmers from time to time regarding the soil and plant health.

Another one is a famous paper published by IEEE in the year 2019. This focuses on plant health and the development phase. It is more of the perception of mixing the wireless sensors and IoT technology to agriculture to shape it more as smart agriculture, as mentioned in the paper.

It focuses on the plant, right from the time it is planted up until it's a fully grown plant.

In the year 2020, MDPI published another paper which was more like a literature survey. It has extensive knowledge about all the applications of IoT in the field of farming and agriculture. It focuses on talking about combining multiple technologies as a whole.

In a paper from IRJET in the year 2020, various smart agriculture methods were discussed. This work is a combination and example of the revolution of technology and automation. It uses sensors and the Arduino UNO board to determine soil health and facts related to it. A basic yet very efficient work.

III METHODOLOGY

This project begins at a very basic and understandable level. Let us first go through the basic sensors used and understand them well to understand what sensors the ideology of this project.

The sensors used are:

Proximity sensor:

A proximity sensor detects the presence of any object or thing in the proximity of the sensor itself. It will be of help to prevent cattle graze problem.

As soon as it senses the presence of any animal nearby, it will inform the farmer about the presence of something. To give it a better shape we can inculcate the applications of DL into it to identify the exact entity, which stays out of bounds for the existing project.

Humidity sensors:

A humidity sensor is used to detect the moisture present in the periphery of the sensor. It will be a useful implementation when we want to know about the presence of moisture content in the soil. This will tell the farmers that it is time for them to replenish water to the dry roots.

This will prevent overflow too as it will tell that their water level is enough now and thus they can stop watering the plants further. Thus preventing the underflow as well as overflow.

Thermostat:

Wondering what a thermostat is doing here? The thermostat is a device used to regulate the uniform temperature in a bound environment. Centralized heating and cooling in the bounded environment will be a

very good solution to exotic fruits and vegetables that are otherwise imported at very high rates because of unavailability and most of the time, these entities land the farmers in loss because the sale is less than the initial investment. It may not sound too practical, but will sound practical when we look into the greenhouse farming principles.

Automating manual predictions is the modification that can add up to this model, which again falls under the predictive analysis and DL.

Arduino board:

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online

IV FUTURE ENHANCEMENTS AND CONCLUSIONS

This might include few more sensors related to therm and humidity. As mentioned that it includes the usage of proximity sensors and thus, it makes it a bit ahead with camera surveillance. Then we can further add few implementations of Machine learning to make it more automated by giving good predictions. Few more technologies like drone surveillance and odor repellent can detect the cattle and then repel them. There are many more implementations that completely depend on user requirements.

References

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