"IMPLIMENTATION OF IOT ON AGRICULTURE SYSTEM"

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1. Abstract:

Crops in farms are many times ravaged by local animals like buffaloes, cows, goats, birds, and fire etc. This leads to huge losses for the farmers. It is not possible for farmers to barricade entire fields or stay on field 24 hours and guard it. So here we propose automatic crop protection system from animals. This is Arduino UNO based system using microcontroller. This system uses a motion sensor to detect wild animals approaching near the field . In such a case the sensor signals the microcontroller to take action. The microcontroller now sounds an alarm to woo the animals away from the field as well as sends Signal through IOT to the farmer phone, so that farmer may know about the issue and come to the spot in case the animals don't turn away by the alarm. This ensures complete safety of crops from animals thus protecting the farmer's loss.

The system installed at the farm also has four moisture sensors which analyze the moisture content of the soil. When the sensors are dry, it automatic switch ON the water pump, keeps the water level maintain in the field.

A motor protection is also installed in the system in which a temperature sensor is connected to the water pump motor. When motor gets heated excessively, then the temperature sensor sense it, and makes the motor turn off and prevent it from the fault.

Keywords:

2. INTRODUCTION:

IOT based Agriculture system is a method in which we use modern technologies to increase the quantity and quality of agriculture products.

This can help the farmers to access all the activities of his farming through GPS and manage his crops easily. Due to increase in population growth it is necessary to produce a sufficient amount of goods which can fulfill the needs of entire population. So this IOT based agriculture system helps us to increase the productivity of our goods and also decreases the time of operation[1].

The different sensors will be used to collect the data from the field and & this data will be uploaded through IOT SHIELD on the application platform.

The data which can be accessed be like moisture in the soil or the water level or the other agriculture related parameters. These can be easily accessed through IOT based system. Farmer's hard work is destroyed by Cattles and predators that results in huge loss to farmers.

To prevent such situation Agriculture IOT has a system that detects the motion of predators using PIR sensors & ULTRASONIC Sensors.

This information can be used by the farmers to reduce damage done by predators[2].

2.1 Problem Statement:

IOT based Farming Framework gives remote sensor network which can deal with various exercises and give helpful data like Soil dampness, Temperature , Mugginess Substance and Flaw on Engine. Ranchers difficult work are obliterated by Cattles and hunters that outcomes in tremendous misfortune to ranchers. This data can be utilized by the ranchers to lessen harm done by hunters.

And furthermore almost 60% of the water utilized in water system is squandered. So we ration water by utilizing soil dampness sensors[3]. During abuse when the engine turns over warming, temperature sensor sense it and programmed siphon gets off.

Also,our project contains hamper, in which engine gets off when any issue current is identified.

In this way, our undertaking gives in general assurance to siphon which will extreme valuable for ranchers.

2.2 Problem Definition:

IOT Based Farming Framework limit the expense ,equipment and assets. It likewise lessens the loses done by hunters and increment the amount of goods. It beats that load of tasks which is finished by physically and keep up the horticultural homesteads in both programmed and manual modes. It ought to have the option to secure the engine because of overheating and short out condition. Almost 60% of the water utilized in water system is squandered. So we ration water by utilizing soil dampness sensors .

3. IMPLEMENTATION:

3.1 Implementation of Soil moisture Sensor: There are three moisture sensors employed in the system. The concept of multiple sensors is based on the fact that different parts of the field may have different amount of moisture at the same time and that has to be taken into consideration. As many no. of sensors can be used in the system although here only four are employed. The sensors actually measure the soil resistivity to gauge the amount of moisture present in it. . The outputs of the sensors are active high which can be seen on an LED which has been connected on the output pin of each sensor so that the status of the sensor can be easily seen. These LEDs also help in setting the sensitivity of the sensors.

The sensors are fed from the probes that are to be inserted in the soil for measuring the resistance between the two points at which the probes are entered. The probes can be of any conductive material, but material which are not corrosive or prone to rusting must be used.

3.2 Implementation of Cattle and Pest protection: Farmers in India face serious threats from pests, natural calamities &damage by animals resulting in lower yields Traditional methods followed by farmers are not that effective and it is not feasible to hire guards to keep an eye on crops and prevent wild animals. Since safety of both human and animal is equally vital[4]. So, animal protection system is necessary in farm areas.so for protecting crops from cattle and pests we use PIR and Ultasonic sensors.

PIR SENSOR:A passive infrared sensor (PIR sensor) is an electronic device that measures infrared (IR) light radiating from objects in its field of view. Apparent motion is detected when an inf temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall.PIR sensor detects a human being moving around within approximately 10m from the sensor.

ULTRASONIC SENSOR: Whenever any obstacle comes ahead of the ultrasonic sensor the sound waves will reflect back in the form of echo and generates an electric pulse. It calculates the time taken between sending sound waves and receiving echo[5],[10].

3.3 Implementation of Water Level Sensor: Water level sensor are used for the automatic detection. Based on the moisture level detected, the arduino directs the pumping motor to switch ON/OFF with the help of relays, thereby pouring the sufficient amount of water to the crops. The process will be monitored by the user and the sequence of alert messages will be sent to the Water level sensor is to connected to the tank or well to sense the level of water. user. . After sensing the water level and the soil content using sensors, the sensed information is fed to the arduino board and the process continues accordingly. The control unit is controlling water pump by arduino which is programmed by particular program. Water pump are connected with an output pin of an arduino via a relay circuit which is connected with a transistor. The two important operations performed by the control unit is ON Operation: If the crop's moisture level is depicted as low, then the pumping motor will be turned on. In this case the– microcontroller will send a positive signal where its emitter and collector will be short. The Relay circuit and the motor pump will get ground signal and for this reason the motor pump will be ON. OFF Operation: If the crop's moisture level is depicted as adequate level, then the pumping motor will be turned off. In this– case the microcontroller sends 0 volt to the base of the transistor so it becomes off which when its emitter and collector becomes open[6],[7],[8].

3.4 Implementation of Pump and Motor protection: During overuse and different climate conditions ,motor starts heating due to which varnish on winding gets vaporize and short circuit is occur in between the winding.

Thermistors are designed to provide over temperature protection for three-phase motors. This assembly utilizes a small PTC disk that has a low base resistance. Once the motor winding temperature reaches the trip temperature of the PTC thermistor, its resistance increases several orders of magnitude for a small increase in temperature. This sharp increase in resistance is easily recognized by the motor protection module or other electronics and can be used to shut down the system before any damage occurs.

CONCLUSION:

The problem of crop vandalization by wild animals and fire has become a major social problem in current time. It requires urgent attention as no effective solution exists till date for this problem. Thus this project carries a great social relevance as it aims to address this problem. This project will help farmers in protecting their orchards and fields and save them from significant financial losses and will save them from the unproductive efforts that they endure for the protection their fields. This will also help them in achieving better crop yields thus leading to their economic wellbeing. We have designed automated Smart Agriculture system which reduces the time and resources that is required while performing it manually. This system uses the technology of Internet of Things. The system also measure moisture of soil and level of water in fields[11].

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