STUDENT PROJECT PROPOSAL

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3. Project Title : _____

4. Sector in which your Project proposal is to be Considered : **Engineering & Technology ().**

5. Project Details : **Proposal Attached**

(1. Introduction, 2. Objectives 3. Methodology 4. Work Plan and 5. Budget)

6. Any other details : **Mentioned in the proposal**

7. Has a similar project been carried out in your college / elsewhere? : **NO**

CERTIFICATE

This is to certify that ……...are bonafide final year student of U.G. Engineering courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of April 2021

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Signature of the Guide Signature of the HOD Signature of the Principal/ Head of the Institution

Signature of the Co-Guide

TITLE

1. Introduction

In this world of increasing global warming and reducing water level, finding fertile soil with adequate moisture content is a difficult task. Farmers and other cultivators hence need to determine the value of soil moisture before sowing seeds or investing in crop fertilizers. Also another aspect of farming can be the different moisture requirement, temperature and humidity of the surroundings by different crops. Some crops require less amount of soil moisture and some require more. The temperature and humidity of the surroundings also matter to different crop patterns. Internet of Things (IoT) plays a crucial role in smart agriculture. Smart farming is an emerging concept, because IoT sensors capable of providing information about their agriculture fields. This Project aims making use of evolving technology i.e. IoT and smart agriculture using automation. Usually the farmer pumps the water more or less to cultivate the land. One more type of IoT product in agriculture and another element of precision farming are crop management devices. Just like weather stations, they should be placed in the field to collect data specific to crop farming from temperature. By using soil moisture sensor, Devices gets an alerting message when the moisture level increases or decreases. Also when the water level is too high, there is a separate machine which acts like a ridges, and opens the door for water to go through other fields. If the water level is sufficient for the crops or soil, the machine locks the ridges, stores the water for crops. In this work we can able to rectify the problem, without man power the machine act like a man and makes the ridges automatically based on the water consumption. By using soil moisture sensor, we can also able to get updates about the soil and water level management. We can also add humidity check and machine that flow water to the plants when it needs by using sensors. In soil research, earth water study and agricultural sciences, water content contributes vitally in: groundwater renewal, agronomy, and Soil chemistry. Various methods of measuring soil moisture other than Arduino Direct Method: Known volume of soil material is taken and the volumetric water content is measured. This requires volume (Vw) and mass (Mw) of water. The formula for calculation is water level, finding fertile soil with adequate moisture content is a difficult task. Farmers and other cultivators hence need to determine the value of soil moisture before sowing seeds or investing in crop fertilizers. Also another aspect of farming can be the different moisture requirement, temperature and humidity of the surroundings by different crops. Some crops require less amount of soil moisture and some require more. The temperature and humidity of the surroundings also matter to different crop patterns. In soil research, earth water study and agricultural sciences, water content contributes vitally in: groundwater renewal, agronomy, and Soil chemistry. Various methods of measuring soil moisture other than Arduino Direct Method: Known volume of soil material is taken and the volumetric water content is measured. This requires volume (Vw) and mass (Mw) of water. The formula for calculation is: Lab – based methods: Chemical titration is used to determine moisture content values. Geophysical methods: Time- domain reflectometry

(TDR) Electrical resistivity tomography Ground penetrating radar etc. Satellite sensing methods Traditional method for measuring temperature and humidity was through thermometers. Analog thermometers were not as accurate and precise as the digital methods. The FC 28 hygrometer sensor uses concept of resistance in conduction of electricity through water. Moist soil conducts more due to presence of more ions in water. Dry soil conducts less because of absence of water content. Hence depending on the water content of the soil, a value up to 1023 may be displayed by the sensor. The DHT11 sensor consists of a component that senses humidity and a component called a thermistor which senses the temperature. There is also an IC/ integrated circuit on the back of the sensor There can be three possible cases with the moisture content in the soil of a plant: If the soil of a plant is too moist, the roots get wasted and also the plant does not get enough oxygen from the soil. As a result, the plant dies. When the soil is too dry, the nutrient needs of a plant won't be fulfilled. The soil has just enough water to support effective growth of a plant. 978-1-5386-5933-5/19/$31.00 c 2019 IEEE: Soil Water Content Humidity or more precisely relative humidity can be defined as the amount of water vapour present in the air to the total amount of water vapour the air can hold. Humidity effects the opening of stomatal pores on the leaves for transpiration or moisture exchange with the atmosphere. Stomata can also be stated as the breathing pores for the plant. Effect of humidity on transpiration When the relative humidity of the air is too high, the process of transpiration or evaporation of moisture becomes very difficult, as the plant cannot make water evaporate. In relatively warm temperatures and low relative humidity, plants feel easy to transpire. This reduces the need of fertilizing the plant. Also high humidity in the air promotes the growth of mold and bacteria on the surface of the plants. This results in plant death and crop failure. Fungus and pests which feed on the plant roots also start accelerating in growth due to high humidity levels. Temperature required by plants to grow optimally also varies from plant to plant but obviously too high or too low temperatures kill plants.

Objectives

- ***There is a separate machine which acts like a ridges, and opens the door for water to go through other fields.***
- ***If the water level is sufficient for the crops or soil, the machine locks the ridges, stores the water for crops.***
- ***without man power the machine act like a man and makes the ridges automatically based on the water consumption.***
- ***By using soil moisture sensor, we can also able to get updates about the soil and water level management.***
- ***We can also add humidity check and machine that flow water to the plants when it needs by using sensors.***

2. *Methodology*

- With the help of soil moisture sensors, we can able to get the details about the field and paddy or crops. Water level is the main concept of our project. Maintaining water level to the plants and fields are today's more important way.

- The mechanism acts like ridges, It opens when the water level of the fields is too high, without the man power the machine acts like a door and gives a way to the fields the water level will be given from the water level sensors and soil moisture sensors, when it is too low the ridges didn't open the door for the water and stores until it reaches a standard level for the plants if it is too high the door opens for the water to leave the fields.

- ***6A Single Shaft 1.8 Degree Stepper motor:*** Brushed DC motors rotate continuously when DC voltage is applied to their terminals. The stepper motor is known for its property of converting a train of input pulses (typically square waves) into a precisely defined increment in the shaft's rotational position. Each pulse rotates the shaft through a fixed angle.Stepper motors effectively have multiple "toothed" electromagnets arranged as a stator around a central rotor, a gear-shaped piece of iron. The electromagnets are energized by an external driver circuit or a micro controller. To make the motor shaft turn, first, one electromagnet is given power, which magnetically attracts the gear's teeth. When the gear's teeth are aligned to the first electromagnet, they are slightly offset from the next electromagnet. This means that when the next electromagnet is turned on and the first is turned off, the gear rotates slightly to align with the next one. From there the process is repeated. Each of those rotations is called a "step", with an integer number of steps making a full rotation. In that way, the motor can be turned by a precise angle.

- ***Sensing Units for Ground:*** The Uno from arduino.cc is an open source board, also referred to as a microcontroller board. It is based on the "ATMega328P" microcontroller board. Arduino.cc developed this board. There are digital and analog pins for input/output. The board has 14 digital and 6 analog pins. The programming software that is used to program the board is the Arduino IDE. A Type-B USB cable is used to connect the Arduino board to the computer system. Two probes estimate the volumetric content of water in the soil. Current passes through the soil and then through the probes, after which the moisture value is calculated based on the resistance offered. In more water, soil becomes more conductive and which means resistance decreases. Therefore, moisture value displayed is higher. It has a humidity measuring module, a thermistor and an integrated circuit on the back of the sensor unit. The humidity measurement module consists of two electrodes. Sandwiched between the two electrodes is a substrate that is capable of holding moisture.

4. Work Plan:

Phase I: Purchase of Arduino Genuino Uno, FC-28 Soil moisture Hygrometer sensor, DHT11 Temperature and Humidity sensor for the basic setup and first stage for testing.

Phase II: To check the basic sample outputs through a LED light and displays a separate output through I2C 16X2 LCD display unit. Then to make arrangements and places for the ridge concept using the stepper motor.

Phase III: The Final Output of the project will be shown with the help of soil moisture sensor the water level is calculated and maintained, then the mechanism acts according to the level of the water gives a opening for water to other purposes these final output can be shown in small area of field area or a Small Glass box which is a replica of the paddy fields.

5. Budget

S. No	Materials	Cost (Rs)
1	Arduino Genuino Uno	600.00
2	Soil Moisture Hygrometer Sensor	260.00
3	Temperature and Humidity Sensor	600.00
4	Stepper Motor 6A Single Shaft	6500.00
5	Mechanism Opening and Additional Sensors	2500.00
Total		10,460.00

Expected outcomes

- ***Identification and prevention of Water saving will be done with the help of our project and Plants/Paddy fields can be maintained water level and Ridges will be Maintained automatically.***
- ***Automation of Ridges system can be maintained and it can be placed in any type of plant fields and crops.***

6. Any other details

For this proposed research, we have the following facilities in our institution:

PG Microprocessor Lab, Programming with 8085,8086, and 8051 processors, also we are having kits of ESA 8055 microprocessors -30 Nos, ESA 8086 microprocessors-30 Nos, ESA 8051 micro controller -30Nos, CRO -10Nos, Interfaces- each 10Nos, DELL Optiplex 3020 Computer with MASM Simulator- 25 Nos, ARM7-LPC2148 Evaluation Board -2 Nos, ARM7+ Spartan 3E FPGA Evaluation System-2Nos.

References

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2. Armstrong, S. “How Does Water Affect Plant Growth?”, 2018. [Online]. Available: https://www.gardeningknowhow.com/special/children/how-doeswater-affect-plant-growth.htm. [Accessed: 05- Oct.- 2018].

3. En.wikipedia.org, “Arduino Uno”, 2018. [Online] Available: https://en.wikipedia.org/wiki/Arduino_Uno. [Accessed: 07- Oct.- 2018].

4. Circuitstoday.com, "Arduino & Soil Moisture Sensor-Interfacing Tutorial-Circuit Diagram, Applications", 2018. [Online] Available: http://www.circuitstoday.com/arduino-soil-moisture-sensor. [Accessed: 08- Oct- 2018].

5. Letscontrolit.com, "DHT11 DHT22 - Let's Control It", 2018 [Online] Available: https://www.letscontrolit.com/wiki/index.php/DHT11_DHT22. [Accessed: 11- Oct- 2018].

6. HowToMechatronics, “DHT11 & DHT22 Sensor Temperature and Humidity Tutorial”, 2018. [Online] Available: https://howtomechatronics.com/tutorials/arduino/dht11-dht22-sensors-temperature-and-humidity-tutorial-using-arduino/. [Accessed: 05- Oct.- 2018].

7. **Has a similar project been carried out in your college / elsewhere**: ***NO***