MOISTURE ALARM USING ARDUINO

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Abstract - In agriculture watering plants at regular intervals and at the correct level is a major factor that decides the yield of the year and the profit of the farmer. Irregular irrigation may harm the plants.In case of Over watering more water is being wasted. To overcome all these problem use moisture level alarm.Moisture level alarm in the sense ,it will alert the user when the moisture level of the soil gets below the predefined level.We can build it in our own using an arduino and moisture sensor.This circuit is a combination of Arduino Uno ,Soil moisture sensor,buzzer,and led.When the moisture level of the soil to be monitored is less than the predefined level then led will glow and buzzer will sound and alert us..It can be powered from any standard Arduino with AC mains adaptor (12VAC),or from a suitable battery.

*Key Words***:** ARDUINO-SOIL MOISTURE SENSOR-LED-MOISTURE LEVEL.

1.INTRODUCTION *(Size 11, Times New roman)*

A. Arduino Board

Arduino boards are able to convert analog or digital input signals from different sensors and turn it into an output to turn on or off led, activate a motor, connect to the cloud .One can control arduino board functions by sending a set of commands to the microcontroller on the board via Arduino Integrated Development Environment.Unlike most previous programmable circuit boards, Arduino does not need an extra piece of hardware (called a programmer) in order to load a new code onto the board. You can simply use a USBcable. Arduino is an open source electronic platform consists of hardware and software. Arduino Uno is based on the ATmega328P Processor.

It operates on 16MHz quartz crystal frequency. It has 14 digital input/ output and 6 analog input pins and operates at +5votls. It has 32KB flash memory. Fig 1 shows the Arduino board diagram with input and output pins.

Fig 1: Arduino board

B.Soil moisture sensor

The soil moisture sensor consists of two probes which are used to measure the volumetric content of water. The two probes allow the current to pass through the soil and then it gets the resistance value to measure the moisture. fig2 shows a moisture sensor.
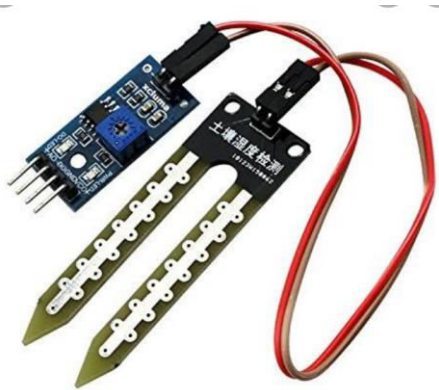

Fig2: Soil moisture sensor

3.Soil Moisture

Soil moisture is the water stored in the soil and is affected by precipitation, temperature, soil characteristics, and more. ... As moisture availability declines, the normal function and growth of plants are disrupted, and crop yields are reduced.Fig 3 shows the moisture level of different types of soil.

Appropriate Soil Moisture Levels by Soil Type

Soil Type	No Irrigation Needed	Dangerously Low Soil Moisture
Fine (Clay)	80-100	**Below 60**
Medium (Loamy)	**88-100**	Below 70
Coarse (Sandy)	90-100	Below 80

Fig3: moisture level of different types of soil

2.HARDWARE CIRCUIT DIAGRAM

In our project we are mainly using soil moisture sensor and LM 317 comparator to compare the predefined moisture value and the moisture level of the soil that is to be monitored.The input(ie.the moisture of soil)is analog this is compared with the predefined value. When the input is less than the predefined value the led glows and the buzzer alerts the user. Fig4 shows the circuit diagram of the project.
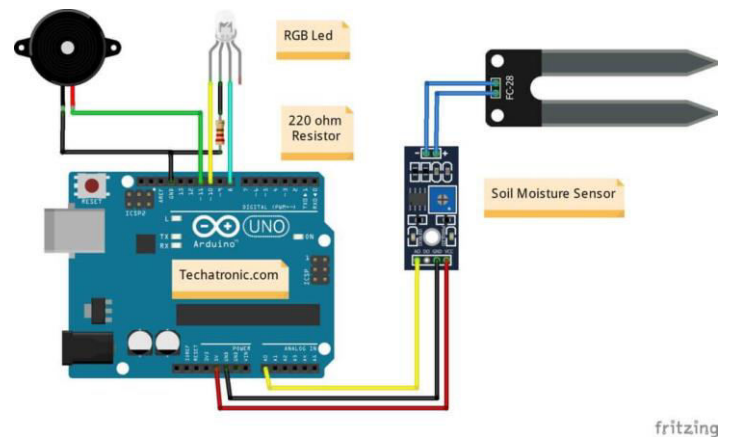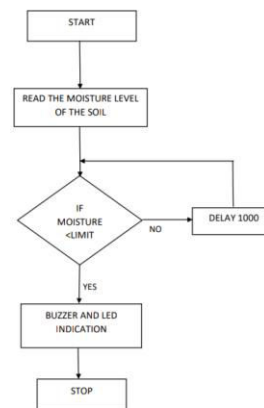

Fig4: circuit diagram of the project

Flow diagram

Soil moisture sensor is used to get the moisture level of the soil .If the moisture level of the soil is less than the limit the led glows.The same process is repeated after each second .

3.CONCLUSION:

From our project we could able to identify with80% accuracy of moisture level of the soil. Fig 5 (a)& (b) shows the soil moisture alarm using arduino hardware output.
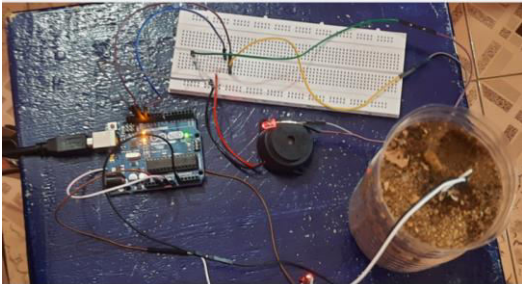
4.FUTURE SCOPE:

In the future we could make it more effective by adding some extra stuff like a temperature sensor to find soil temperature and motor so that a motor would automatically turn on when moisture level is low.

REFERENCES

1)D. Spelman, K. Kinzli, and T. Kunberger. Calibration of the 10HS Soil Moisture Sensor for Southwest Florida Agricultural Soils. Journal of Irrigation and Drainage Engineering, June 2013

2)Arduino: A Technical Reference: A Handbook for Technicians, Engineers, and Makers Book by J. M. Hughes.