

AGRO-CARE

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ABSTRACT

The main objective of this project is to build a sensor-based product which will help in smart agriculture. Smart farming is an emerging concept, because these sensors can provide information about their agriculture fields. The paper aims making use of evolving technology i.e. smart agriculture using circuits. Monitoring environmental factors is the major factor to improve the yield of the efficient crops. The project Agro-care will deal with the concept of hardware circuiting where the factors like soil moisture and motion detection to prevent the crops from getting invaded by wild animals. The moisture level depends on the climatic conditions. This project will try to improve the today's condition of farmers. This project will help to do a better cultivation and grow quality crops.

Keyword: - sensors, smart agriculture, circuits, soil moisture, motion detection.

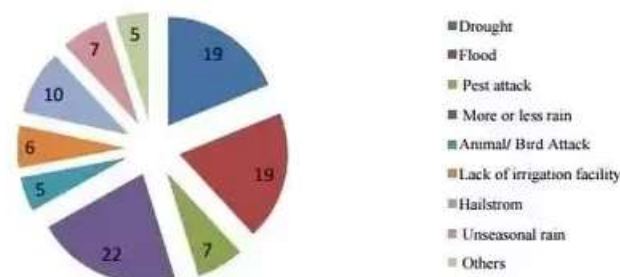
1. INTRODUCTION:

This project mainly works and uses the concept of IoT. IoT circuit is used. The project is Agro-care, which will be used in the agriculture field. The project deals with the two factors related to agriculture that is maintaining the soil quality of crops based on soil moisture which will again depend on climatic conditions and then the other major feature is motion detection, a lot of crops are damaged by the attack of animals or any other natural factor, so the motion detection raises an alarm which makes farmer of the field aware of the situation. This help the farmers to grow better crops and good cultivation is possible with the help of this project.

1.1 Reasons related to crop failure:

The main reasons behind the crop failure are improper water distribution or facility, the crops being damaged by animals/ birds, the climatic conditions do major play role, but the insufficient water for the crops or the over flow of water in crops which make them rot is also responsible for destroying them [1]. In India, most of our population rely on agriculture as their living, in this era of technology there must be a system to monitor these factors.

Reasons for Crop Destruction



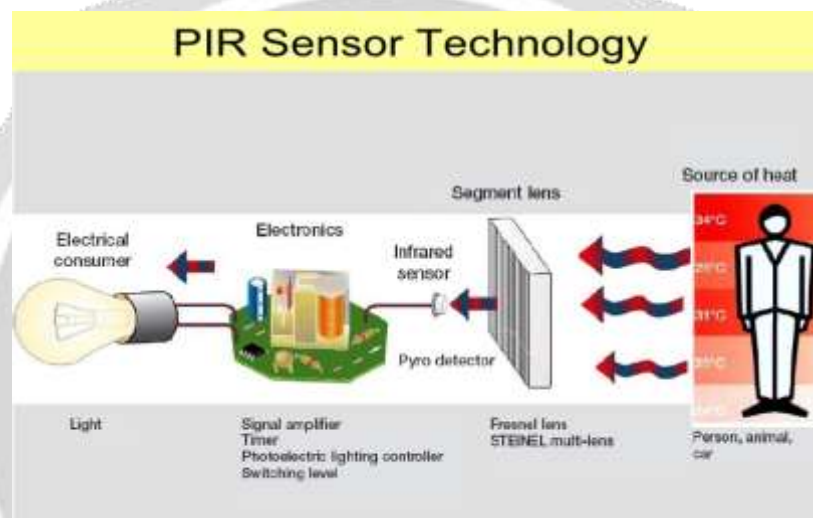
[1]

2. THE HARDWARE AND THE SOFTWARE REQUIREMENTS:

The hardware requirements mainly contain sensors, which are soil moisture and humidity sensor, PIR sensor and Raspberry-Pi. We use Python programming for the Raspberry-Pi. Talking about Python language it is a high level, general purpose coding language. Most importantly its easy to understand and simple to code.

2.1 PIR SENSORS:

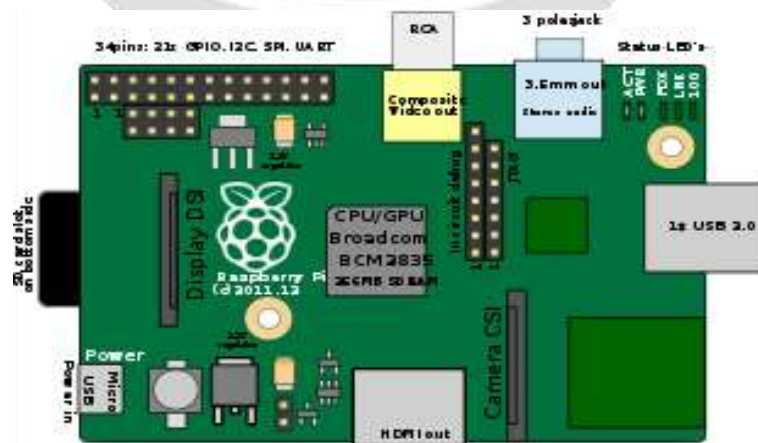
The Passive Infra-Red sensor (PIR sensor) is an electronic sensor that measures infrared (IR) radiation being emitted from objects in its field of view. They are most often used in PIR-based motion detectors sensors have ranges of up to 10 meters (30 feet), a single detector placed near the entrance is typically all that is necessary for a single entrance. PIR-based security systems are also viable in outdoor security and motion-sensitive lighting; one advantage is their low power draw, which allows them to be solar-powered.



[2]

2.2 RASPBERRY-PI:

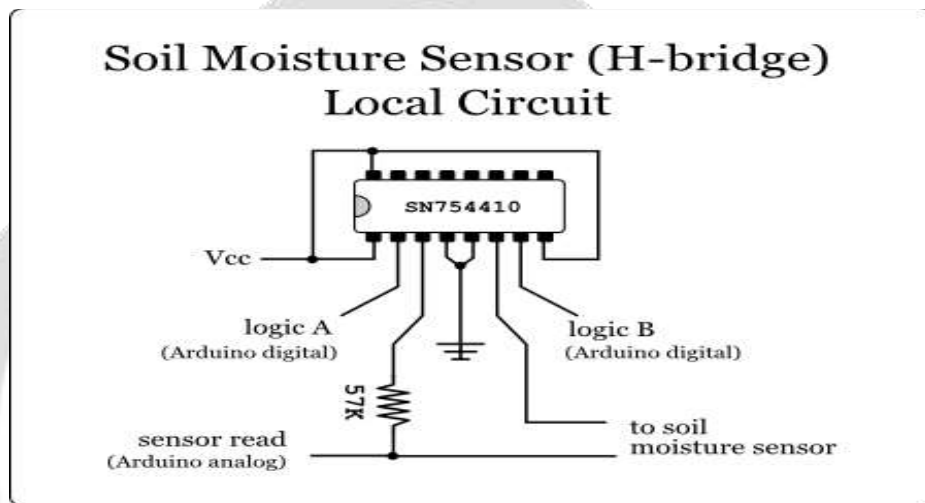
- The Raspberry Pi is a series of small single-board computers.
- Processor speed ranges from 700 MHz to 1.2 GHz for the Pi 3; on-board memory ranges from 256 MB to 1 GB RAM.



[3]

2.3 SOIL MOISTURE SENSORS:

Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content. The relation between the measured property and soil moisture must be calibrated and may vary depending on environmental factors such as soil type, temperature, or electric conductivity. Reflected microwave radiation is affected by the soil moisture and is used for remote sensing in hydrology and agriculture. Portable probe instruments can be used by farmers or gardeners.

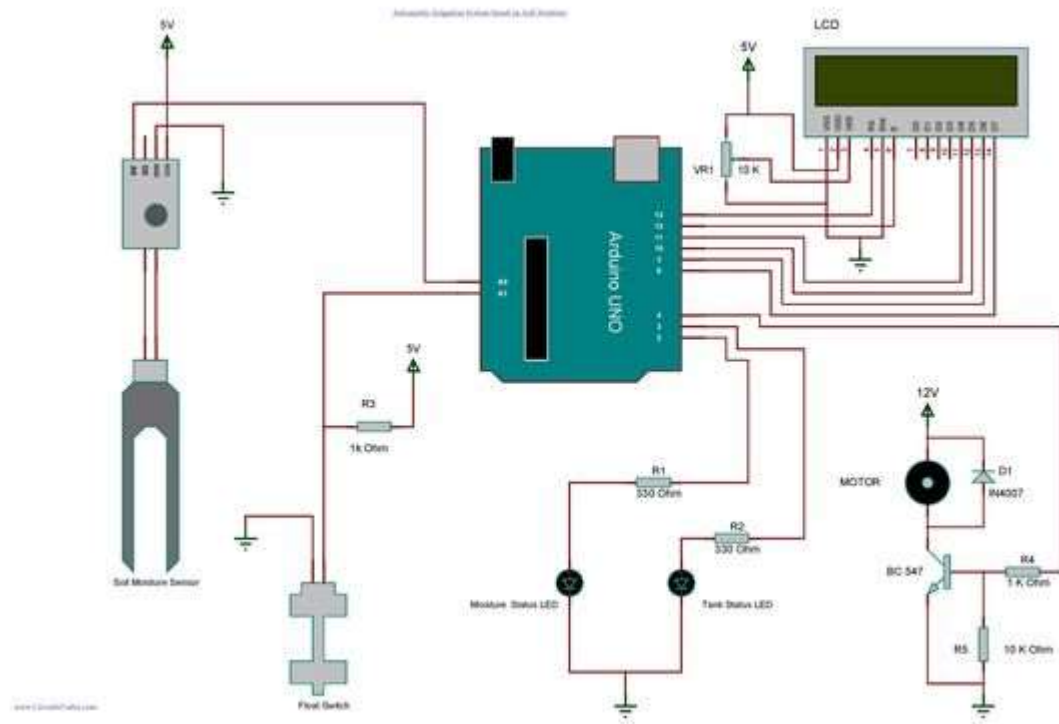


3. THE WORKING OF THE PROJECT:

This project works in the manner that the sensors having the signals will transmit it to the interface Raspberry-Pi. The Raspberry-Pi is either connected to the display device or it move to the drivers which transfers the signal to use the pump.

SYSTEM DESIGN





[4]

4. ADVANTAGES AND DISADVANTAGES:

This system can be helpful while farming. This system can help in producing quality crops. The system can be used in green house.

The sensors are generally costly (if used for larger areas). Installation cost is barrier.

5. FUTURE ENHANCEMENT:

Site specific fertilizers can be determined. During, harvesting the sensors can monitor the production of harvest of raw production of crops. A spraying machine can be aided with the optical sensors for the detection of weeds and diseases of crops.

6. REFERENCES:

- [1] <https://www.quora.com/What-are-the-biggest-problems-faced-by-farmers-in-India-What-problems-can-be-solved-through-use-of-technology>
- [2] <http://www.instructables.com/id/Introduction-to-PIR-Sensor-and-Integrating-It-With/>