IMPLEMENTATION OF SMART IRRIGATION SYSTEM USING SOIL MOISTURE SENSOR

Submitted in partial fulfillment of the requirements of the degree

BACHELOR OF ENGINEERING
in
CIVIL ENGINEERING
(A.Y. 2021-2022)

by

Shubhamkumar Pathak (A/56)

Sarvesh Pandey (A/51)

Roshan Prajapati (A/60)

Rohan Mishra (A/45)

Under the Guidance of

Ms. Ugandhara Gaikwad

Designation

Professor

University of Mumbai

Department of civil engineering (2018-22)

This is to certify that **Mr. Shubhamkumar D. Pathak, Mr. Sarvesh R. Pandey, Mr. Roshan L. Prajapati, Mr. Rohan R. Mishra**. are Bonafede students of Thakur College of Engineering and Technology, Mumbai. They have satisfactorily completed the requirements of the project as prescribed by University of Mumbai while working on "**IMPLEMENTATION OF SMART IRRIGATION SYSTEM USING SOIL MOISTURE SENSOR**".

Mrs.Priyanka Deshmukh	**Dr. Seema Jagtap**	**Dr. B. K. Mishra**
(Guide)	**(HOD Civil)**	**(Principal)**

Internal Examiner:

Signature with Date: ……..

Name: ……..

External Examiner:

Signature with Date: ……..

Name: ……..

Thakur College of Engineering and Technology Kandivali(E), Mumbai-400101.

PLACE: Mumbai

DATE:

ACKNOWLEDGEMENT

At the outset of our project, we take this opportunity to express our sincere heartfelt gratitude to our project guide and mentor, **Ms. Ugandhara Gaikwad** Mam who with his guidance and valuable advice helped us in the project.

We are also thankful to Dr B. K. Mishra, Principal TCET, Mumbai, Dr Seema Jagtap, Head CED, TCET, Mumbai, for giving a lot of freedom and encouragement and the faculty members of TCET, Mumbai, for providing all kind of possible help throughout for the completion of research work.

Mr. Shubhamkumar pathak

Mr. Sarvesh Pandey

Mr. Roshan Prajapati

Mr. Rohan Mishra

ABSTRACT

India is a country with Agriculture as the major profession. More than half the population of India (72%approx) is engaged in primary activities like agriculture. Due to the population growth, the demand for food and water is Tremendously increasing. Thus, in the agriculture sector, the main challenge faced by the farmer is the optimization of water. There is a need to set up a system that keeps track of the utilization of water in the field. The only advocacy solution is improvement in irrigation techniques. The smart irrigation system using soil moisture sensors is an idea proposed by us to reduce the excessive use of water and provide proper yielding to the crops we are using the " Extra sunshine hour" module the practitioner can attain the desired quality of yield irrespective of any climatic condition.

KEYWORDS:

Soil moisture sensor, extra sunshine hours, desire yielding, grow lights.

Table of Contents

Chapter 4

Chapter 5

Chapter 6

List of Tables Table:

List Of Graph:

List Of Flow Chart:

List of Figures Figure:

Chapter 1
INTRODUCTION

1. GENERAL INTRODUCTION:

As we know the greatest problems faced by the world is water shortage and agriculture being a demanding occupation consumes plenty of water. In traditional irrigation method, the requirements of water for crops is not monitored by the framer. Even when the soil contains enough moisture, water is still provided/supplied. This water is not absorbed by the plants and thus it is wasted. Therefore, we have developed smart irrigation system to effectively control water system component through a completely mechanized framework that Enhances landscape health as well as gives quick results using soil moisture sensor that measure moisture at root zone and optimizes use of water.

The soil moisture-based irrigation control uses Tensiometric and Volumetric techniques, which are relatively simple but these quantities are related through a soil water characteristic curve that is specific to a soil type. To enhance landscape health, we used the extra sunshine method. The "Extra sunshine Hour" module uses a certain hue of light for the nourishment of crops as per the practitioner's necessity. This Extra Sunshine Hour " module helps to achieve the desired quality of yield. We have used two different spectrums of light i.e. Red and blue which is the crucial spectrum used by the plants for photosynthesis to transform water, sunlight, and carbon dioxide into oxygen, and simple sugars that the crop uses as fuel. In an automatic plant watering system or we can say it smart irrigation system. we are using an Arduino microcontroller to control and sense the thing in the projects such as sense or measure the moisture in the soil we are using soil moisture sensor.

Fig1: Field Image

Chapter 2
LITERATURE SURVEY

2.1 LITERATURE SURVEY:

A lot of works has been done and is currently going on this topic. A low-cost smart irrigation system is proposed by,

[1] Anushree G, Badagowni Swapna, Juturu Maneesha, Badagowni Swapna whose objective was an automation system which conducts pre-processing and feature extraction techniques on the image has been developed to detect casualties in the agricultural fields which makes it easy to detect flames and save the yield by using wireless sensors and cameras. Which not only provide comfort but also reduced energy and time wastage. Basically, In the proposed model ARDUINO UNO can be used instead of raspberry pi. It's very easy to interface analog sensors, motors and other electronic components with Arduino, with just few lines of code. On the other hand, the proposed model is not affordable by poor farmers or farmers residing in remote areas where they are not able to access electricity. So, the model should be prepared in such a way that poor farmers can also use it and the can gain the power supply through solar means.

[2] Automation in Agriculture using AGROBOT done by the authors Sindhu B R, Asha K, Raghu C, Chethan Shindhe R, Sahana P. Their proposed model was Use of "AGROBOTS" in agricultural field for various purposes activities such as ploughing, sowing seeds, spreading water to plants, cultivating crops, spraying medicine on plants, and cutting off plants. But in a case if the AGROBOT stops due to some obstacle and if water starts sprinkling automatically then there can be an issue of excess watering in the field. We criticized that the AGROBOTS used in agricultural fields should be designed in such a way that they can withstand the climatic and physical (wear and tear) conditions and supply absolute amount of water in the field.

[3] A Review on Solar Photovoltaic Powered Water Pumping System for off-Grid Rural Areas for Domestic use and Irrigation Purpose which was done by the authors Yigrem Solomon, P. N Rao, Tigist Tadesse focused on the Utilization of solar photovoltaic powered (PV) as a power source in water pumping system to provide water for domestic use and irrigation purpose. In

this one can use many alternative viable sources such as dye-sensitized solar cells, organic photovoltaics, perovskite solar cells, quantum dot PV, wind energy, tidal energy, etc. instead of photovoltaic cells. The proposed model uses photovoltaic cells which in turn is not more effective in the areas with excessive rainfall or rainy areas so alternative source will be required for the energy generation.

[4] Smart cultivation which was proposed by Amisha Ishwarbhai Antiya, Komal Sattaiah Annaldas, Dimple Raghuveer Swami, Ms. Nitika Rai. They focused to design a system to incorporate precision agriculture as well as automation of certain farm processes using wireless sensor networks and IoT technology. In this case study most of the parameters and precautions are mentioned. The following model cannot be implemented by poor farmers and on larger areas due to the cost efficiency so it should be made available in such a manner that poor farmers can purchase it.

[5] The objective of Agricultural Sprinkler for Irrigation System which was proposed by the authors Nirali Hemant Patel, Chintan Rajnikant Prajapati was to identify the groundwater critical zones, study the fluctuation of groundwater levelland analyses the trend of Ground water level. But during the supply of water in the field if there is a leakage in the hose then there can be a case of water logging in the field. So, for sustainable supply an alternative durable discharge line should be applied. By observing the following papers our main motive was increment in yield, sustainability and availability for the people involved in the agricultural sector. By focusing on the following motives, we have adopted the method of implementation of soil moisture sensors in the agricultural field in an effective manner.

[6] Smart Irrigation System based on Renewable Energy which was proposed by Shirsho Paul and group they proposed an automated irrigation system was developed to optimize water use for agricultural crops. The system has a distributed wireless network of soil-moisture and temperature sensors placed in the root zone of the plants. In addition, a gateway unit handles sensor information; triggers actuators and transmits data to a web application. An algorithm was developed with threshold values of temperature and soil moisture that was programmed into a micro controller-based gateway to control water quantity. The system was powered by photovoltaic panels and had a duplex

communication link based on a cellular-Internet interface that allowed for data inspection and irrigation scheduling to be programmed through a web page. The automated system was tested in a sage crop field for 136 days and Water savings of up to 90% compared with traditional irrigation practices of the agricultural zone were achieved. Three replicas of the automated system have been used successfully in other places for 18 months. Because of its energy autonomy and low cost, the system has the potential to be useful in water limited geographically isolated areas.

[7] IoT Enabled Smart Irrigation System, Monitoring and Water Harvestingin Different Soils which was proposed by Dr. Madhu Kumari and Anant Kumar Sah proposed This project focuses on an IOT based smart irrigation system which is cost effective and can be used by a middle-class farmer in farm field. Today we are living in 21st century where automation is playing important role in social life. Automation allows us to control machines automatically. It not only provides comfort but also reduce energy, efficiency and time saving. Agriculture plays an important role in the life span of human being and not only for their survival but also for the better economic growth of the country as well. Fastidiousness agriculture is the new trending term in the field of technology whose main motive is to reduce the workload of the farmers and increase the productivity of the farms by using technologies like I.O.T, WSNs, Remote Sensing, Drone surveillance and many more. In this paper, we show the work done by our cost effective and reliable device whose aim is to irrigate fields only when there is a need of water and to provide information. The information is sent to the farmers by using cloud website called thing speak. The farmers can monitor their farm's field using simply by just browsing the channel link of thing speak.

[8] Wireless Smart Irrigation System which was put forward by Mrutyunjay Senapati, Ram Krushna Das and Biswajit Samal illustrated that Agriculture is the most essential thing to develop countries economy also water supply is becoming scarce in today's world for this reason there is an urgency of adopting smart way of irrigation. Basically, India is an agricultural country, in India most of the people prefer Agriculture for sustaining their life and agriculture depends on the monsoons which are not sufficient source of water. The objective of this paper is to overcome this challenge, the whole system is micro control based and can be operated from remote location through wireless transmission so there is no need to concern about irrigation timing as per crop or soil condition. Sensor is used to take sensor reading of soil like soil moisture, temperature, and decision making is controlled by user (farmer) by using microcontroller. The data received from sensors are sent to server database using wireless transmission.

[9] Plant Monitoring System which was proposed by Gaurav Patil , Shashank Pathmudi and Akash Patil they proposed that today's world only some devices like PC's and mobiles are connected to internet. Now-a-days world is fully overtaken by the internet and internet of things. Internet is use for basic need of all human beings. The Internet of Things (IOT) is the network of physical objects. It simply means to monitor a physical device or machine, or it is inter-networking of physical devices which is embedded with electronics, sensors, software and network connectivity to enable it to achieve greater value and services by exchanging data with the manufacturer. This project is designed as a plant monitoring system based on IOT. In this project we used different modules such as IOT, NodeMCU, Temperature sensor, Moisture sensor, Humidity sensor

[10] Smart Irrigation System Using Arduino and Android which was proposed by Santhiya. P, Lakshmitha. G, Monisha. J and Akshaya. T , they proposed that - Water is the most important resource for plants. But during summers, most people are too lazy to water the plants every day. To overcome this issue smart irrigation system using arduino and android is used. The existing system uses pc and cloud computing to store the data which is reads by sensors and the drip is controlled. The proposed system is to ON/OFF the drip using bluetooth wherever we go. Using this system reduces data storage devices. The Microcontroller Arduino is used to control this System and Android is connected to controller and it controls the drip. The sensors are to take values from surroundings and store it in a controller. According to this value the drip can be ON/OFF. It is controlled manually and usage of storage device is reduced and no network problem will occur.

[11] Aadhunik Krishi – IoT based Smart Farming which was proposed by Niharika Agrahara, Amit Kushwaha, Saayali Vispute, Arshad Ubare and Siuli Das they proposed that Agronomy has a significant contribution in shaping and boosting the economy of the developing nations especially India. The issues faced by the agricultural zones are hampering the growth of these economically developing nations. One technique to solve this problem is to digitize farming and other agricultural activities by replacing the current prediction-based method with smart and analyzed farming. Hence the proffered work aims to automate agriculture using IoT and other wireless technologies. In this paper, an Internet of Things based automatic crop monitoring and watering system, is proposed to modernize agriculture and increasing the yield of the crop. The major benefit of this proposed work is the implementation of precision agriculture with cloud computing, which will control the usage of water and monitor other plant parameters (soil moisture, temperature, humidity and air quality index) thus enhancing the yield of the crops.

[12] Optimized Irrigation System using IoT on Cloud based Weather Monitoring which was derived by Dr. L. Ramasethu, R. Monica, M. Nandhini and A. Nekha proposed that IoT based crop-field monitoring and automated irrigation system which also can be called Smart farming system can help to reduce wastage, by enabling the effective usage of fertilizer and soil water thereby increasing crop yield. This system is built to monitor crop-field using sensors (Water level Sensor, pH sensor, Rain sensor,Ultrasonic sensor,Soil moisture Sensor, temperature sensor, humidity sensor) and to automate the irrigation system. The data from sensors are sent to the webpage using wireless transmission. The data can be visualized on the designed Web page where the readings from the sensors can be viewed. The irrigation is automated in that irrigation is only enabled when the soil moisture of the field falls below the threshold for optimal crop growth. The notifications are sent periodically to the web page as well as the mobile app developed for farmers. The farmer can monitor the field conditions anywhere, anytime.

2.2 RESEARCH GAPS:

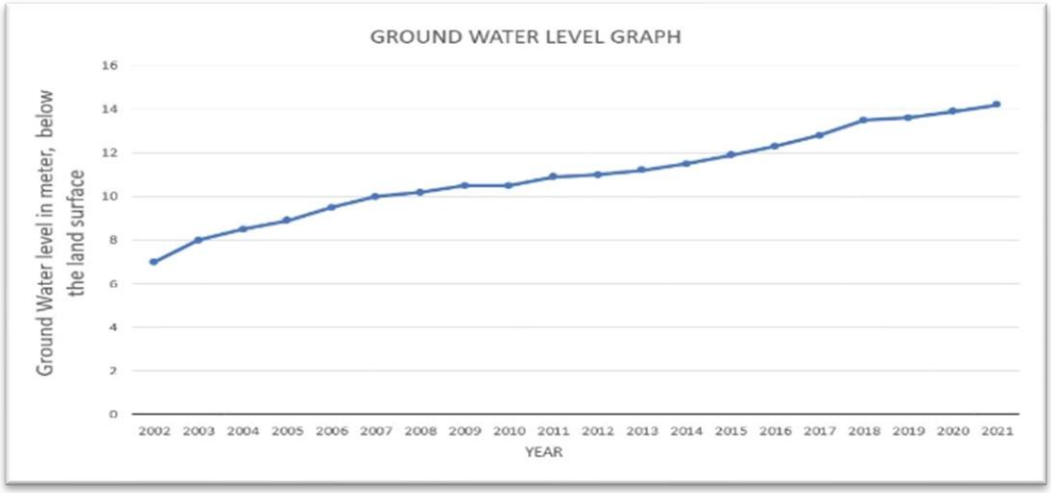
From the survey, we can see how the water percentage is reducing year by year from 1960 to the present. If the rate remains it leads to a water shortage. So there is an emergency to conserve water. The reason behind this shortage of water is using a traditional system of irrigation During the traditional system requirement of water to plants is not monitored properly.
Also, the recently known methods like Drip irrigation, Sprinkler irrigation, Center pivot cannot withstand the adequacy of efficient water conservation.

Surface and groundwater supplies are being increasingly polluted by agricultural, domestic/urban, and industrial use. Groundwater containing naturally occurring ions like arsenic and iron is increasingly being used, causing drinking water supplies and agriculture problems. This excess amount of water is not absorbed by the plants and is wasted thus. To monitor the water requirement of the plants a system is needed. Implementing smart irrigation helps to decrease the loss of water caused by using the traditional system.

2.3 PROBLEM DEFINITION:

1. Until quite recently, India enjoyed abundant water resources. But population growth and overexploitation have led to a situation where the water demand is exceeding the supply.
2. And we can see that graph last 20 years the ground level goes down because,

3. During manual irrigation, the water necessity of plants/crops is not monitored. Even when the soil is moist sufficient, water is yet provided.
4. This water is not absorbed by the plant and thus is lost. Hence, a system is to monitor the plant's water requirements is needed.



Graph 1: Ground Water Level Graph

Chapter 3
PROPOSED METHODOLOGY

3.1 PROPOSED METHODOLOGY:

Our proposed methodology is that we are going to prepare a smart irrigation system Arduino based soil moisture sensor.

The following components are to be purchased by the Wholesalers: Arduino uno (with USB), four relay board, soil sensor (probe), jumper wires (m/f) and jumper wires (f/f).

After buying all the required components we are going to connect system in a manner which is shown in below circuit diagram. We are going to perform test in which we will create a miniature model of the agricultural field. There will be division of the field into two parts. On both the sides agricultural crops are to be grown, on one side we will apply the traditional method to water the crops and on the other side we will use our proposed model soil moisture sensor which is to be connected to a motor which will in turn supply water in the field through valves. Readings of the discharge for both the methods are to be taken and analyzed for a given period of time. According to our proposed analysis the one half of the model where soil moisture sensor is used for irrigation has up to 65% of increase in efficiency which in turn increases the yield and it reduces the volume of water required for irrigation up to a greater extent. While the other half which is to be irrigated using the traditional method (pumping system, rain, canals) has less efficiency with respect to the irrigated area using soil moisture sensor.

Fig2: setup of smart irrigation system

Fig3: Growth of Plant Using Smart Irrigation System

3.1.1 The Working of Our Proposed Smart Irrigation Model:

The field study generally includes the process of implementation of our model into the agriculture field. Which will work in the following ways.

1) In this we are using Arduino uno to control and sense the thing in the project such moisture of the soil.
2) By sensing the moisture of a soil at root zone system will analyze the output and depending upon the output, our system will take necessary action to irrigate field or not.
3) Soil moisture sensor basically works as resistor which varies its value when it comes in contact with moisture when moisture will increase then the resistance will decrease and vice versa.
4) So, we first calibrating the values of sensor at different moisturing condition. After getting the values will put it into if condition of code.

Days	Smart irrigation system In ml	Traditional Irrigation In ml	Time
01/04/2022	350	500	1PM
02/04/2022	280	400	1PM
04/04/2022	240	400	1PM
05/04/2022	240	400	1PM
06/04/2022	220	400	1PM
07/04/2022	200	400	1PM

Table1: Water Consumption of Smart Irrigation and Traditional Irrigation

Graph 2: Water Requirement with Respect to Time

3.2 Extra Sunshine Hour: -

The "Extra sunshine Hour" module uses a certain hue of light for the nourishment of crops as per the practitioner's necessity. This Extra Sunshine Hour " module helps to achieve the desired quality of yield.

We have used two different spectrums of light i.e., Red and blue which is the crucial spectrum used by the plants for photosynthesis to transform water, sunlight, and carbon dioxide into oxygen, and simple sugars that the crop uses as fuel.

By observing the current need in the agricultural sector for vegetating the desired yield we have developed a component named " Extra Sunshine Hour ".

Indoor farming is increasingly proclaimed as the destiny of current farming. While there is no conventional economics of indoor farming, the increasing quantity of involvement in large scale vertical farming by several large indoor farming corporations is a good step forward. These corporations have been able to put forward millions of dollars to expand their current installations and ascertain new ones.

Crucial to the creation of a perfect indoor farming climate for both small and large operations is the availability of affordable, complicated lighting technologies. There are many various types of grow lights. Let’s take a nigher look.

3.2.1 What Are Grow Lights?

In its simplest description, a grow light is a manufactured source of light, commonly an electric light, which is formulated to stimulate the growth of plants by emitting an electromagnetic expanse perfect for photosynthesis. Such lights are commonly used to applycations where there is a lack of realistic light or additional light is required. Say for example, during the winter months, grow lights can be used to supply extra hours of light for plant growth. It assists grow vegetables and fruits grow indoors as well.

In vast scale, indoor farming undertakings, grow lights can entirely replace direct sunlight. However, grow lights don’t constantly have to mimic sunlight exactly. In many applications, they can surpass sunlight.

3.2.2 Types of Grow Lights:

There are Lights, Front asic types of grow lights available for indoor urban farming: Fluorescent grow lights, HPS or HID grow lights, and LED grow lights.

Fluorescent Grow Lights. Fluorescent grow lights are used for growing herbs and vegetables indoors. They are two types, including fluorescent tubes and Compact Fluorescent Lights (CFLs). Fluorescent ducts come in many different emphases. They last longer and are more energy energy-efficient descent bulbs--the common bulbs that have been lighting homes for decay energy-efficient bulbs are very thin and can easily fit into small small aces. As for downsides, they expect a ballast to legislate current and the tubes require a stand, relatively than a conventional socket. Such requirements can add to the cost of establishment.

On the other hand, CFLs have serve more common in household usage and not just in indoor urban farming. CFLs use only 20 to 30% of the fuel consumed by traditional incandescent bulbs and their lifespan is six to eight times lengthier. They are by far the inexpensive among all three major types of grow lights. One notable benefit with CFL bulbs is they don't emit extra heat, allowing farmers to keep the lights closer to the plants. This low warmth feature makes it very energy profitable as well.

3.3.3 The Role of LED Grow Lights in indoor Farming:

- The improvements in LED technology have earned it possible to establish the perfect environment to grow vegetables at a large scale with shorter growing cycles and higher yields. LED is becoming the de facto source of lighting to establish the most advantageous controlled environment for indoor farming. The progress in LED technologies has made the indoor cultivation of vegetables very energy-efficient.
- While most indoor farms use LEDs these days, many are yet to entirely convert to LEDs due to the somewhat high price tag. But the gradually decreasing prices of LEDs should help those farmers renovate to LED as it offers a significant power saving.

3.3.4 Things Indoor Farmers Must Know About LED Grow Lights:

Lighting is the most significant aspect of creating a precise indoor farming climate. It can be a "make or break" decision for your indoor farm. So, it's highly proposed that you spend enough time planning and formulating the layout of your plants and lights. The use of CAD (Computer-Aided Design) is highly proposed. The design should be optimized so that no light will be spent.

We can control these lights with the help of an application that operates the Arduino.

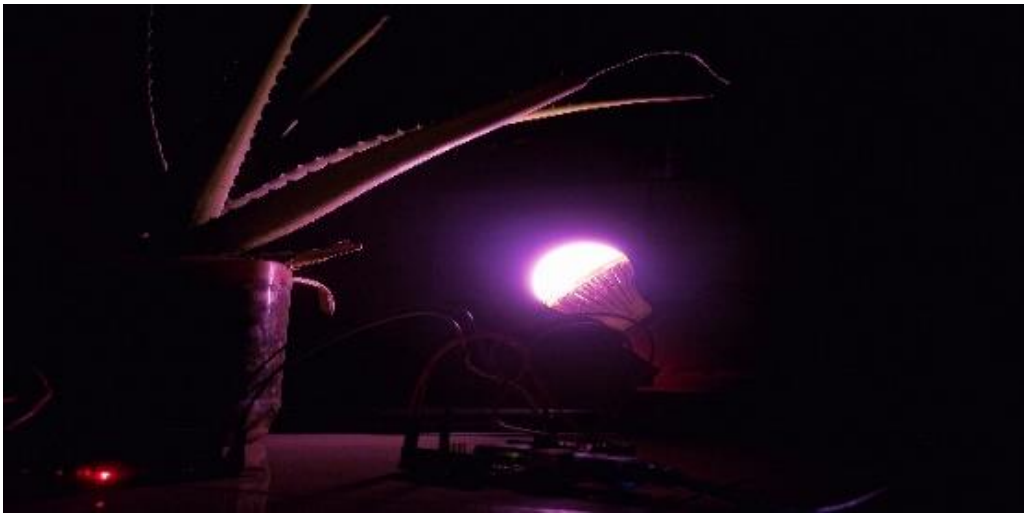
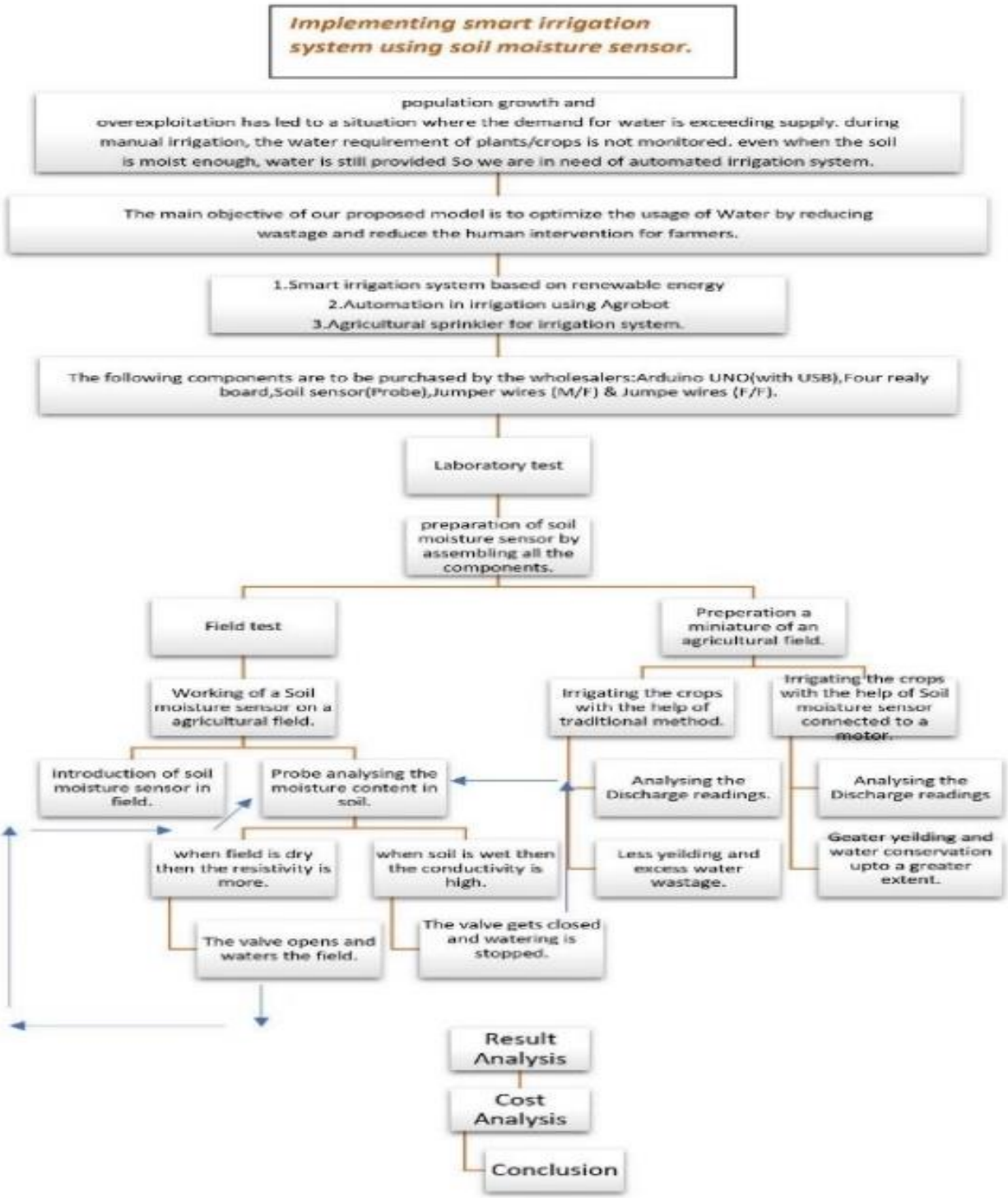


Fig4: Extra Sunshine Hour Image

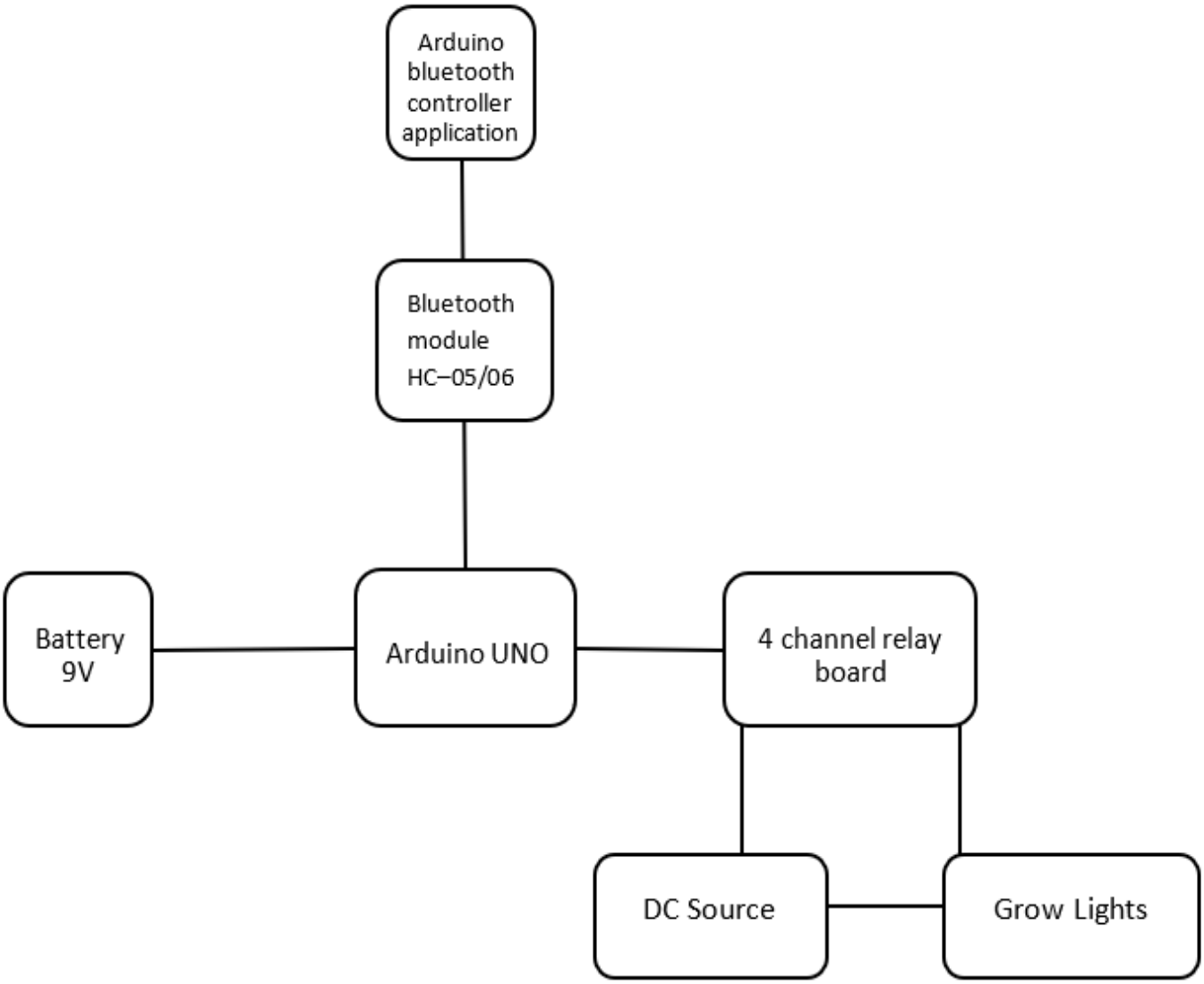
What are the key features of the Extra Sunshine Hour module?

1) Obtaining Desired Yields.
2) Easy monitoring.
3) Flexibility in control.
4) Off-season nourishment to crops.

List Of Flow Chart:



Flow Chart 1: Working of Smart Irrigation System



Flow Chart2: Flow Chart of Extra Sunshine Hour

Codes

```
int water; //random variable
void setup() {
  pinMode(3,OUTPUT); //output pin for relay board, this will sent signal to the relay
  pinMode(6,INPUT); //input pin coming from soil sensor
}

void loop() {
  water = digitalRead(6);  // reading the coming signal from the soil sensor
  if(water == HIGH) // if water level is full then cut the relay
  {
  digitalWrite(3,LOW); // low is to cut the relay
  }
  else
  {
  digitalWrite(3,HIGH); //high to continue proving signal and water supply
  }
  delay(400);
}
```

Code1: Smart Irrigation System

```
// Extra sunshine hour code
int relay = 8;
char sms;
void setup()
{
  pinMode(relay, OUTPUT);
  digitalWrite(relay,HIGH);
  Serial.begin(9600);
}
void loop()
{
  if(Serial.available()!=0)
  {
    sms = Serial.read();
  }
  if(sms == 'a')
  {
    digitalWrite(relay,LOW);
  }
  if(sms == 'b')
  {
    digitalWrite(relay,HIGH);
  }
}
```

Code2: Extra Sunshine Hour

4.3 The following are the components used:

1. **Arduino Uno:** Arduino Uno is a small open-source control panel based on the microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with digital anchor and analog input / output (I / O) sets that can be connected to various extension boards (shields) and other regions. The board has 14 digital I / O pins (six capable of PWM output), 6 PINM analog I / O pins, and is configured via Arduino IDE (Integrated Development Zone), in the form of a USB cable of type B. It can be powered by a USB cable or an external 9-volt battery, although it accepts volumes of between 7 and 20 volts. Same with Arduino Nano and Leonardo.

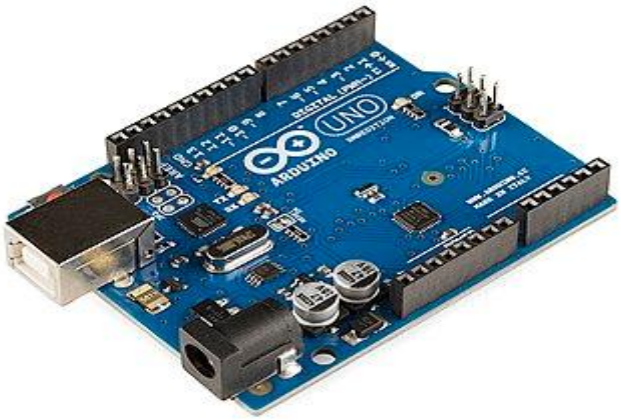


Fig5: Arduino uno

2. **Soil moisture:** Soil moisture is difficult to define because it means different things in different fields. For example, the concept of a soil moisture farmer is different from that of a water resource manager or a weather forecaster. Generally, however, soil moisture is stored in areas between soil particles. The topsoil is 10 cm above the soil, and the root soil moisture is the water found in plants, usually considered to be 200 cm above the soil. Soil moisture sensor is used to measure the water content of grains. The soil moisture sensor has two probes, which are responsible for the flow of energy in the ground leading to the detection of the resistance level and the relative humidity level.

Fig6: Soil Moisture Sensor

3. **Relay module:** Relay is electromechanically used in comparison. a small amount of electric current that can control the switching function of large electrically operated devices. The Arduino Uno cannot control the maximum voltage and current.

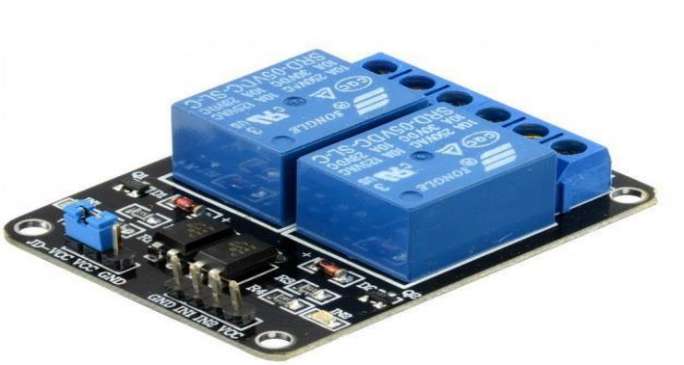


Fig7: Relay Module

4. **Water Pump:** In terms of water pumping the project's 12-volt submersible pump with an 18-watt engine capable of lifting water up to 1.7 meters. This fuel should only be used when fully immersed in water for best results, so we need to store water in a bucket because if the water pump will work without water, it will be damaged.

Figure8: Water Pump

5. **Breadboard:** Breadboard is a non-commercial model of temporary electrical model and test circuit designs. Many electronic components in electronic circuits can be connected by inserting their track or terminals into the holes and making wiring where appropriate. The bread board has metal strips under the board and connects holes at the top of the board. Breadboard is a cheap, easy-to-use piece of hardware for assembling electrical cords. Breadboards get their name because they resemble the cutting board used to cut bare bread.

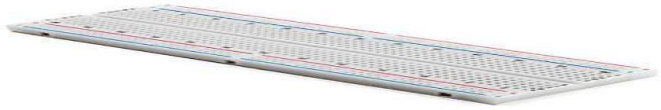


Fig9: Breadboard

6. **Jumper wires:** Jumper wire are simply wires with connecting pins at the end, which allows them to be used to connect two points to each other without attaching. Jumper straps are often used with food boards and other measuring tools to make the circuit easier as needed. Although the jumper straps come in a variety of colors, the colors mean nothing. This means that the red jumper

wire is technically similar to the black. But colors can be used to your advantage to distinguish between types of connections, such as ground or strength. In this project two types of jumper straps were used for Male to Male and female for male.

Fig10: Jumper Wires

Chapter 4
OBJECTIVES OF STUDY

4. OBJECTIVES OF STUDY:

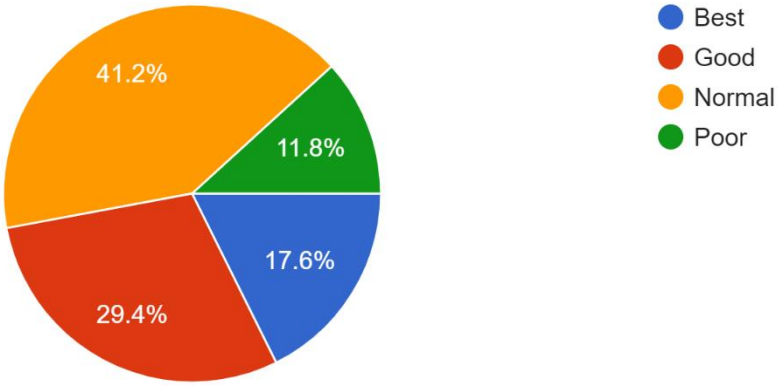
1. The main objective of our proposed model is to optimize the usage of Water by reducing wastage.
2. Soil moisture sensors measure soil moisture at the root zone and regulate the
3. existing conventional instigation timer, resulting in considerable water savings when installed and used property.
4. The main aim of the "Extra Sunshine Hour " module is to enrich plant growth ensuring the increased yield in any climatic condition.
5. The motive for this system is to reduce human intervention in the field.
6. To enrich the health of the soil and hence the plant via multiple sensors.
7. It can provide a high accuracy water supply and avoid water from wastage. Due to automatically handling, the user requires less manpower. With the help of the sensors, it can accurately determine the soil moisture levels.
8. To observe parameters for better yield.
9. This prototype aims at saving time and avoiding problems like constant vigilance.

Chapter 5
SURVEY

5. Survey:

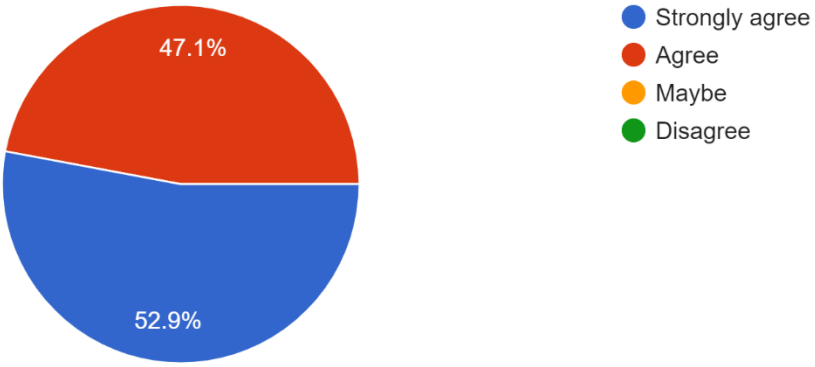
Q1. What do you think about the irrigation system of india.

17 responses



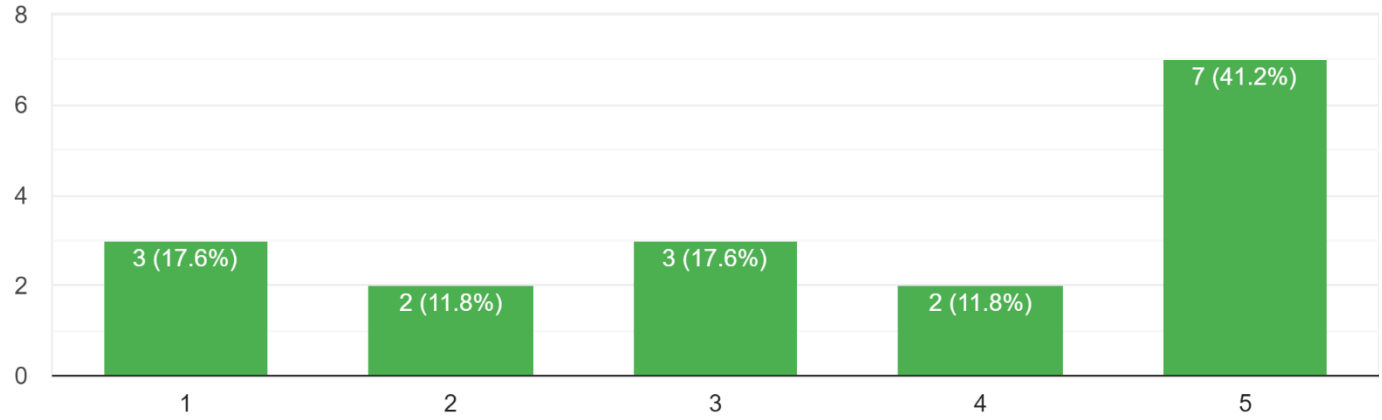
Q2. By observing the water shortage in the India, Smart irrigation can preserve water by overcoming it's wastage?

17 responses



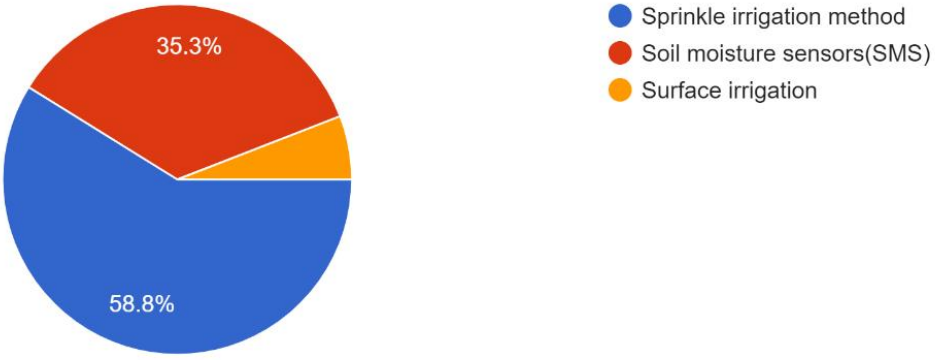
Q3. What do you think that over irrigation/watering is good for crops and fields .

17 responses



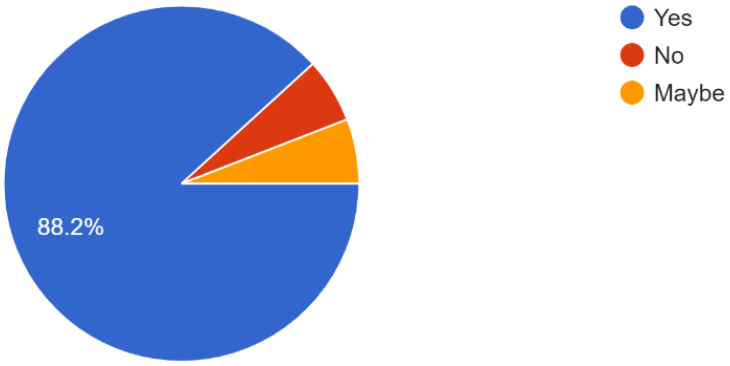
Q4. What do you think which method is effective to overcome excess-irrigation/watering?

17 responses



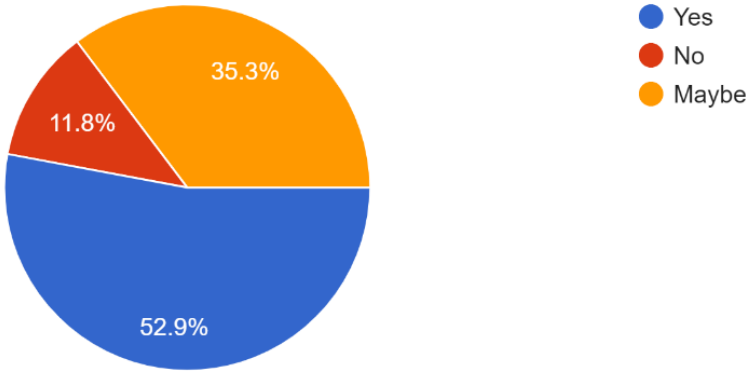
Q5. If we water the field by observing the moisture content in the soil at the time when water is needed, will it be able to control excess watering.

17 responses



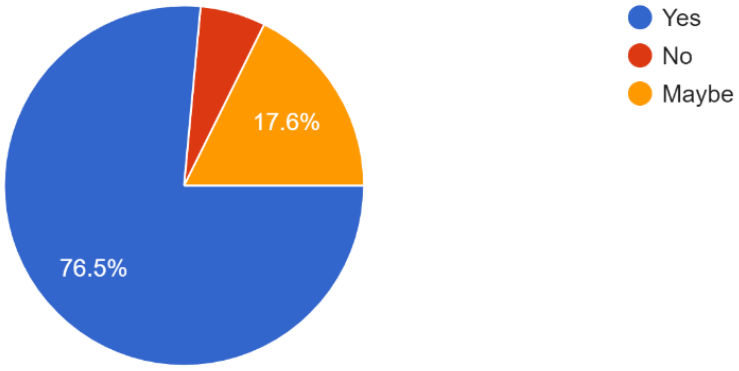
Q6. What do you think will soil moisture sensors can be costly for the farmers of India.

17 responses



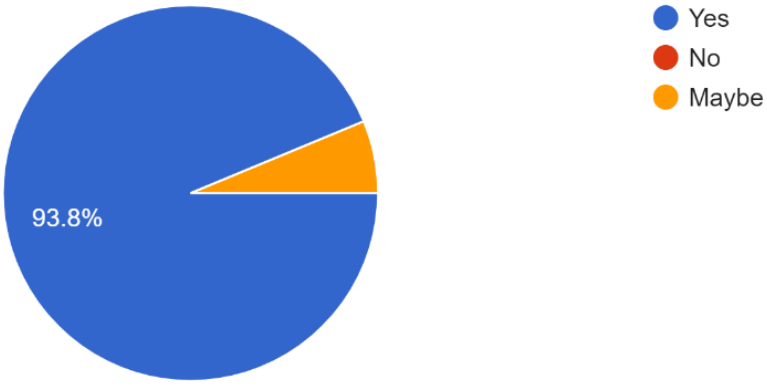
Q7. If we introduce such type of sensors in larger irrigation areas will the pace of productivity and yielding will increase?

17 responses



Q8. Will soil moisture sensors can bring a new irrigation methodology in India?

16 responses



Q9. According to you which method can increase the yeild without wastage of water and causing harm to the agricultulral field.

13 responses

SMS

soil moisture sensors

By planting more trees!... the land will not loose water completely then.

-

Save water

Don't know

Moisture sensor

Sprinkle

Quality of soil that how much water it needs

Q10. What measures you will take according to you to save water.

12 responses

Rainwater harvesting

Will ise the water...as less as we can use

contaminating clean water

Binod

1.Check your toilet for leaks.
2.Stop using your toilet as an ashtray or wastebasket. ...
3.Put a plastic bottle in your toilet tank
Take shorter showers.
Install water-saving shower heads or flow restrictors. ...
Take baths. ...
Turn off the water while brushing your teeth. ...
Turn off the water while shaving

Sprinkle irrigatio

Chapter 6
CONCLUSION

CONCLUSION:

Our smart irrigation system is feasible and cost effective for optimizing resources of water in agriculture production.

1) Our project can help in improving the irrigation system in places with water scarcity.
2) Hence this will result in good production crops and obviously saving of time and money.
3) Our technology makes the farmer more comfortable by reducing their manual intervention in farms and automation makes this level up.
4) Our system is linked to extra sunshine hour module which will increase yield and crop growth.

With the help of the" Extra sunshine hour" module the practitioner can attain the good quality of yield irrespective of any climatic condition.
One can control the lights through an application anywhere at any time which in term reduces human intervention in the field.

REFERNCES:

1) **YOU CAN ALSO REFER OUR BLOG ON THIS PROJECT.** https://lordsavitar51.wixsite.com/smartirrigation
2) **OUR VIDEO:**
   https://youtu.be/gI-5MttGrDw
3) Sindhu B R, Raghu C, Asha K, Chethan Shindhe R, Sahana P, 2021, Automation in Agriculture using AGROBOT, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) ICACT – 2021 (Volume 09 – Issue 08), https://www.ijert.org/automation-in-agriculture-using-agrobot
4) Baraka, K., Ghobril, M., Malek, S., Kanj, R., & Kayssi, A. (2013). Low-cost Arduino/Androidbased Energy Efficient Home Automation System with Smart Task Scheduling. In Fifth International Conference on ComputationalIntelligence, Communication Systems and Networks (pp. 296–301). https://doi.org/10.1109/CICSYN.2013.47
5) Caetano, F., Pitarma, R., & Reis, P. (2015). Advanced System for Garden Irrigation Management. In New Contributions in Information Systems and Technologies (pp. 565– 574). https://doi.org/10.1007/9783-319-16486- 1_55
6) Anushree G, Juturu Maneesha, Badagowni Swapna, Nallagatla Swathi, Ravikumarr V G, 2019, Smart Agriculture System to Detect Flames using IoT and DIP, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) NCRACES – 2019 (Volume 7, Issue 10), https://www.ijert.org/smart-agriculture-system-to-detect-flames-using-iot-and-dip
7) Dobbs, N. A., Migliaccio, K. W., Li, Y., Dukes, M. D., & Morgan, K. T. (2014). Evaluating irrigation applied and nitrogen leached using different smart irrigation technologies on bahiagrass (Paspalum notatum). Irrigation Science, 32, 193–203. https://doi.org/10.1007/s00271-013-0421-1
8) Gutiérrez, J., Villa-medina, J. F., Nieto-garibay, A., & Porta-gándara, M. Á. (2013). Automated Irrigation System Using a Wireless Sensor Network and GPRS Module. In IEEE transactions on instrumentation and measurement (pp. 1–11). https://doi.org/10.1109/TIM.2013.2276487
9) Nirali Hemant Patel , Chintan Rajnikant Prajapati, 2020, Agricultural Sprinkler for Irrigation System, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 09,

Issue 05 (May 2020), https://www.ijert.org/agricultural-sprinkler-for-irrigation-system

10) Houstis, E., Nasiakou, A., & Vavalis, M. (2017). Linking Smart Energy and Smart Irrigation: Integration, System Architecture, Prototype Implementation and Experimentation. In 3rd International Congress on Energy Efficiency and Energy Related Materials (ENEFM2015) (pp. 143–149). Springer International Publishing AG. https://doi.org/10.1007/978-3-319-45677- 5_17

11) Islam, M. S., Khanam, M. S., & Sarker, M. N. I. (2018). Health risk assessment of metals transfer from soil to the edible part of some vegetables grown in Patuakhali province of Bangladesh. Archives of Agriculture and Environmental Science, 3(2), 187–197. https://doi.org/10.26832/24566632.2018.030201 3

12) https://www.google.com/amp/s/www.thisoldhouse.com/platform/amp/gardening/22621681/best-led-grow-light