

# Green House Monitoring and Controlling

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**Abstract** - As we all know that agriculture play an important role for creating agricultural society or country . From the past century agriculture has been the primary occupation of man but due to natural factor of climatic condition farmers are facing lots of problems which may lead to tackle serious problems in their life so this paper presents the monitoring and control system for greenhouse through the internet of things (IOT).This system will help to control the various environmental conditions such as soil moisture, temperature and humidity extra this system will provide the best climatic condition for the growth of the plant.

**Key Words:** Microcontroller, Sensor, IOT

## 1. INTRODUCTION

We are living in the era of science and technology. Day by day newer inventions are emerging. Those inventions are not only making our life easier but also turning the impossible things to possible. Today everything can be controlled and operated automatically. India is the second largest populated country in the world after China and no doubt India's primary occupation is agriculture. To serve all the people with food and all other plant-based products, agriculture plays an important role. However, automation has not been adopted or not been put to a full-fledged use in agriculture. It is still performed in the primitive way using the natural environment and manual interventions which are inevitable. One of the reasons behind automation not being adopted is the cost. We have a solution to this, and it is greenhouse which is cost-friendly. There are several techniques developed to make crop production effective but none of them are capable to adjust the environmental factors required for that specific plant to grow. Greenhouse is the only method of crop production that makes the use of control of the environmental factors. A greenhouse provides basic methods for employment to its owner and is financially practical for the specific atmosphere in which it stands. Also, greenhouse could be defined as advanced innovation for protected horticulture that addresses the major natural elements like light, temperature and irrigation. This report goes into the usefulness of using the IoT based on the greenhouse to utilize low-cost tools and decrease the effort of the farmers.

## 2. LITERTURE SURVEY

From the technical point of view, IoT is being a system of interrelated computing devices, sensors, or actuators that provides different services over the internet, some of them are Agriculture.

IoT helps in making Agriculture more convenient for Farmer by providing various monitoring techniques.

Many intellectuals have done enormous work on the greenhouse monitoring system as some of the paperwork introduced by Rupali Satpute. et al. [1], Aadil Imam. et al.[2], Remya Koshy. et al.[3], and many others used different devices with IoT. In this paper, we are using IoT with Arduino Uno for controlling and monitoring greenhouse plants and also, we are using Solar Panel to improve the electricity facilities.

## 3. BLOCK DIAGRAM

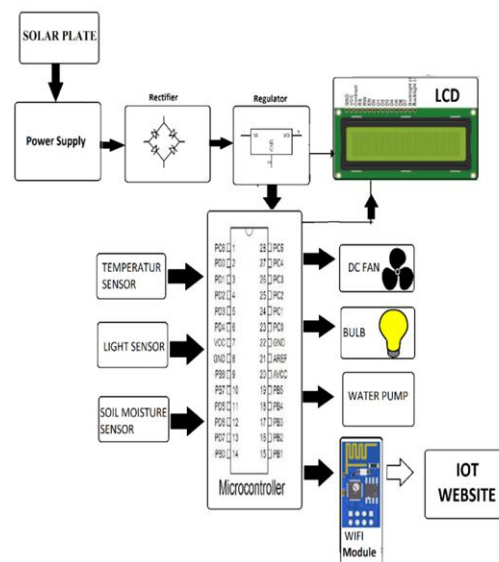


Fig 1. Block Diagram of GREEN HOUSE MONITORING AND CONTROLLING

#### 4. HARDWARE

##### A. Arduino Uno Microcontroller

Arduino Uno is ATMEGA328 based microcontroller. It can be powered via power supply as well as USB connection. It has 6 analog, 14 digital pins and Reset button. Fig 2 shows the Arduino Uno Board.



Fig 2. Arduino Uno Board

##### B. TEMPERATURE SENSOR

Temperature Sensor is used to detect the temperature inside the greenhouse. Reading from the sensor is sent to the microcontroller.

In this project we used LM35 temperature sensor. Fig 3 shows the Temperature Sensor.



Fig 3. TEMPERATURE SENSOR

##### C. SOIL SENSOR

This sensor can be used to test the moisture of soil, when the soil is having water shortage, the module output is at high level, else the output is at low level. By using this sensor one can automatically water the flower plant, or any other plants requiring automatic watering technique. It is having adjustable sensitivity and threshold level can be configured.



Fig4. SOIL SENSOR

##### D. SOLAR PANEL

In this project, we are using Solar Panel as a backup for power supply. The term solar panel is used colloquially for a photovoltaic (PV) module. A PV module is an assembly of photovoltaic cells mounted in a framework for installation. Photo-voltaic cells use sunlight as a source of energy and generate direct current electricity

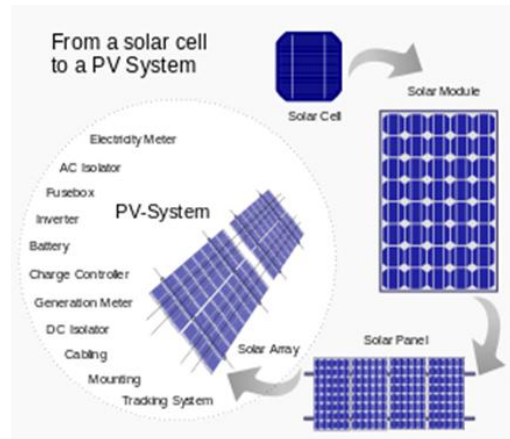


Fig4. SOLAR PANEL

#### 5. ADVANTAGE

1. With the use of greenhouse, it is possible to cultivate food-producing plants in the time of the year where natural environment is not in favor. This includes excessive rain, wind, hailstones and even the unfavored temperature.
2. We can avoid the insects and harm they can cause to the plants but also keep the ones that are beneficial to them using greenhouse. Moreover, it will be more effective when we provide the plants with their kind of nutrition.
3. There are a lot of herbal plants and flowers that work as medicinal herbs. They can only be grown in a specific time of the year. But with the help of greenhouse monitoring and controlling system, we will be able to grow them up in any time of the year and provide medicines for the people who need them.
4. With a proper use of the greenhouse, the farmers as well as the government can boost up their economy in a short time as the net crop production will increase and so will the quality.

#### 6. ENHANCEMENT POSSIBLE IN FUTURE

1. We wanted to use solar plates instead of electricity which would avoid the cost of power consumption and become more environment friendly. This will make the whole module of low cost, low power operation. Hence, easily affordable to everyone.
2. By using the IoT based application in the future, our daily life will change drastically as we will be able to monitor and control the system from wherever we are as far as the internet is connected.

## 7. CONCLUSION

Setting up a greenhouse that uses the IoT monitoring and controlling system will minimize human error as well as labor cost and maximizing the production. India having the main occupation as agriculture and also the main aspect for its economy, this project will strengthen the farmers and the country financially. It is so affordable and convenient that anyone can use this system to grow the plants they want in any environmental condition. It also being eco-friendly has no damage to the environment.

## 8. REFERENCES

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