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Creating agricultural climatic condition

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ABSTRACT

Nowadays food production is a major concern. The prices of off-season vegetables & fruits are increasing day by day just because of storage & poor production due to which quality also degrades. This project comes with an idea of the production of vegetation during the off-season. We are offering all the required factors for proper agriculture even in the off-season. It will be a revolution in agriculture which can serve the increasing population with quality assurance at cheaper rates. As it is very clear from the title i.e. "CREATING AGRICULTURAL CLIMATIC CONDITION", we are dealing with the climatic condition which is not favourable for the desired crop. Such an environment will be created which helps the crop to grow naturally even in the off-season. Mainly work has been done on three factors, those are moisture content in the soil, temperature & light. The whole setup is fully automated which is useful as well as eco-friendly.

Keywords— *Food production, Agriculture, climatic condition*

1. INTRODUCTION

In the present era, the demand for food is very high but the production is not as much good to meet the demand. This difference between production and demand will definitely increase in upcoming days due to a continuous increase in population.

In this paper, the whole setup is built on a microcontroller which mainly controls the three factors and those are moisture content in the soil, temperature and light. Here we have the soil moisture sensor to measure the volumetric water content in the soil, using this principle the water pump will automatically turn-off when soil moisture crosses a particular limit. Due to this a vast amount of water can be saved and the fertility of the soil will also be maintained. Artificially UV rays can be provided by using UV rays emitting bulbs. The heat and light can be controlled by using temperature sensors. When the temperature of the surrounding crosses a particular limit cooling fans will automatically operate and the bulb will be switched off accordingly.

2. SYSTEM OVERVIEW

220 volt AC supply is provided to the step-down transformer which lowers the value of the voltage. In the next step, rectifier is used to convert AC supply into DC. The filter capacitor is used to obtain a pure DC supply.

The microcontroller is connected with relay driver, 5V Voltage Regulator, LCD display, Light sensor and soil sensor. All connections are made with a microcontroller in order to give a fully automated touch to the setup.

Fig. 1: Block Diagram

Table 1: Hardware used in the system

Name of Hardware	Use of Hardware in the proposed system and specifications
Microcontroller	To control and operating the system. It is connected to all components of the system. 40 Pins Two 8 bit and one 16 bit timer. Capture and compare module, serial port, parallel port and five input / output ports.
Voltage regulator	To regulate the voltage level It generates a steady output voltage of a circuit in response to variations in an input voltage conditions
Transistors	For switching applications, transistors are biased so that it remains fully on if there is a signal at its base. In the Absence of the base signal, it gets completely off.
Transformer	It is a static device which is used to change the voltage according to requirement. Here we have used a step-down transformer which converts 220 V supply to 12 V supply.
Temperature sensor	A temperature sensor is a thermocouple or a resistance temperature detector that gathers the temperature from a specific source and alters the collected information into understandable type for an observer.
Relay	A relay is an electrical switch that opens and closes under the control of another electrical circuit
Light Dependent Resistor (LDR)	An LDR is also known as photoconductor is a resistor whose resistance increases or decreases depending on the amount of light
LCD	It is used to display the output as in this setup LCD displays the values of temperature and soil moisture
Relay Driver	To operate the device connected to the relay as per the requirement

3. CONCLUSION

This project's work is to create agricultural climatic condition using microcontroller, relays, soil and temperature sensors. This system assures the saving of water and production of vegetation even in off seasons. During irrigation when soil moisture crosses a particular limit, soil sensors will sense it and the connected relay will operate due to which the water pump will turn – off . In winter seasons when there is no proper sunlight then the temperature detector will sense the temperature and the connected relay will operate . Due to all this , the UV bulb will operate and will act as sun. When temperature of the surrounding crossed a particular limit the fans and coolers will turn on and normal the surrounding temperature. Therefore creating agricultural climatic conditions saves water and can meet the demand for food

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