

SOLAR POWER TRACKING & AUTO IRRIGATION SYSTEM

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ABSTRACT

In the Agricultural field India is one of the best country. In the recent year agriculture field changes rapidly to reduce the human effort. The key objective of this project is decreasing the manual efforts and optimum use of water. In the farmers area electricity available for only few hours which is in day or night.

In this project we use the solar panel for the generation energy i.e. electricity. There is a need of more output from farm area and correct use of water. When the soil moisture sensor sense the moisture percentage above the we decide in the program at that time relay send the signal to the motor ON and when moisture level is below decide value then motor turns Off.

There are many plants which required minimum level of moisture. If the moisture is insufficient then the plant will die and farmers get minimum output. By irrigate the crop according to the moisture percentage they need, is provided by the soil sensor. Due to the presence of sensor crops will irrigate properly. Solar Tracking is advance type of power generation. For this purpose, automatic plant irrigation system is designed using moisture sensor and solar energy.

KEYWORDS: Solar Panel, Irrigation System, Moisture Sensor, Arduino etc.

INTRODUCTION

Since the life of people depends on the agriculture. There are different types of irrigation system but there are some problems arise or may be uneconomical. The proper method is use for to avoid wastage of water and where lack of water is available. Now days there are less availability of water due to extracting the water from the earth. Modern technology in the agriculture will save water which essential in nowadays.

There is also load shading problems arises in the villages so if sometimes there is water is available but at that time there is no electricity i.e. load shading. There is increase in demand of electricity day by day and due to this reduction in renewable energy sources. For all these problems we have the best solution of 'Solar powered irrigation system'. Solar panel collects the solar radiation from the sun and converts into energy to electricity. From solar tracking great efficiency will be increased.

While being continues flow of water and portable enough to bring with, into any location (such as hydroponics system /green housing system etc.). We can optimum water by using the sensor and the Arduino. The best irrigation system is providing by the drip system.

OBJECTIVES OF PROJECT

- To start the motor by soil condition.
- To display the soil moisture level on display.
- Design a system that tracks the solar UV light for solar panels.

SPECIFICATIONS

Table no.1: Specifications of Solar Power Tracking Auto Irrigation System

SR. NO.	COMPONENTS	SPECIFICATION
1	Solar Panel	20W
2	Battery	12v 7.2Ah
3	DC Motor	12v
4	Moisture sensor	4.2v ,3.2mA
5	Relay	12v
6	ARDUINO	UNO board
7	Stepper Motor	12v
8	Motor Output	4 liter per minute
9	LCD	2×16

SYSTEM DESCRIPTION

The motive of this project are too built for the nourishing the plants where can reduce human efforts and reduces the wastage of water. From tracking of panel we get the proper energy. Solar panel is monocystal type. Here for making the programming we use the Arduino.

This project will focus on solar tracking system and the moisture in the soil. On the display we get the percentage of water. For this we can use number of soil sensor for the selected places. Relay is type of switch when current is flow through it and relaypass signal to the motor.

For water pumping us use the DC Motor which output will be 4 litre of water in one minute. Arduino is used as controller in this system.

BLOCK DIAGRAM

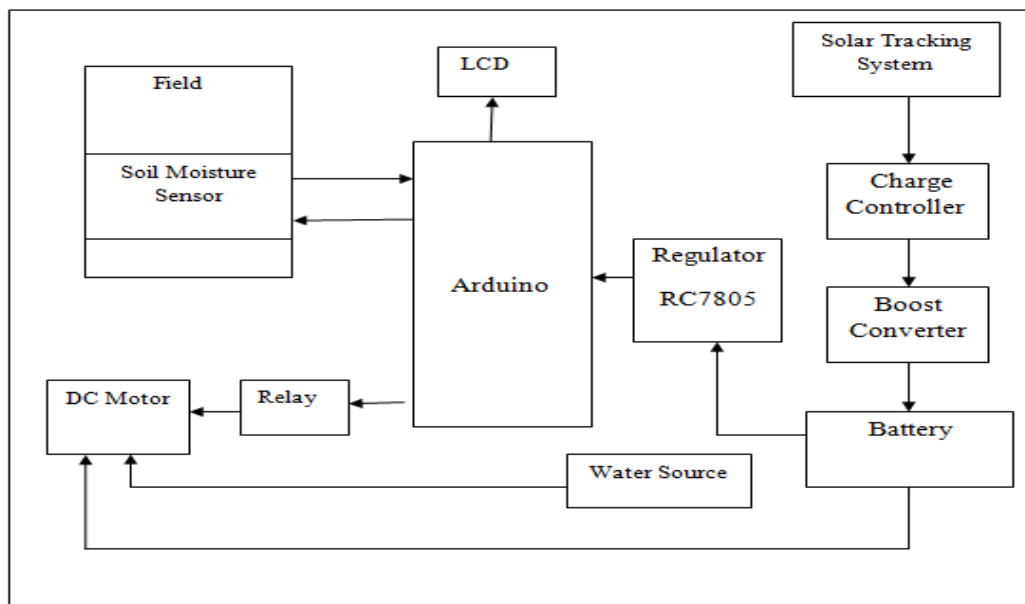


Figure no.1: Block Diagram of Solar tracking and Auto Irrigation system

SYSTEM PERFORMANCE

In this project we use the solar tracking system which uses to generate electricity which is renewable energy and which is need have now days. Solar tracking system gives extra output than the normal system.Solar tracking system use to generate electricity which is use to run the system and for the continue power output supply there should be charge controller used.

Soil moisture sensor used to sense the moisture in the soil and display it on the display board for the storage purpose we use the battery which is used for the backup purpose. For rotate the solar panel we use the stepper motor which is programmed and rotate in stepwise manner.

It is also use the dc motor and program is built in the Arduino. The Arduino is software plus hardware device. Solar tracking is done by using stepper motor which gives more efficiency as compared to LDR tracking system.

Relay is used to start the as a sensor. When soil moisture sensor dipped in the dry field at that time motor gets ON and when it is wet that means when the moisture in the soil gets greater than set value then motor get OFF. For motor ON and OFF, we set the certain limit in Arduino program. We can decide the moisture level as per the crop and that value can be put in the program. As per the requirement we can select the number of soil moisture sensor and select the location. For making the water supply we can prefer the drip irrigation. It provides the suitable water supply to the crops.

ADVANTAGES

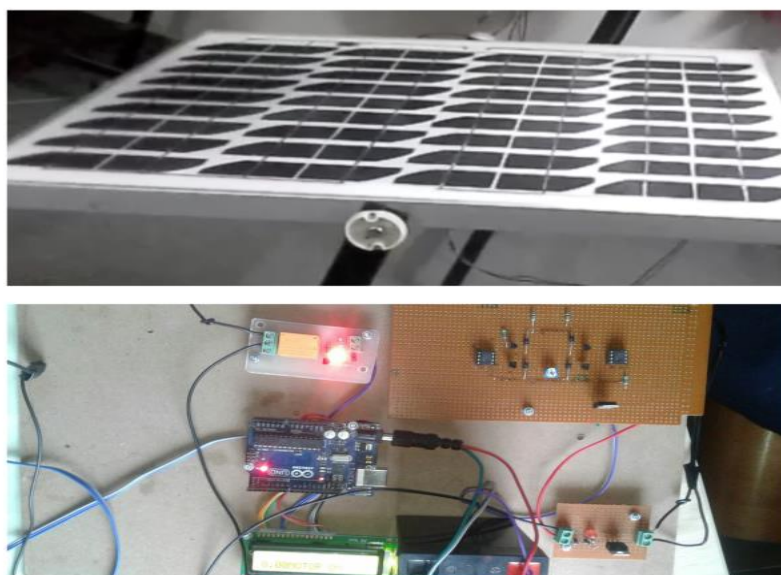
The Solar powered tracking Auto irrigation system has following advantages:

- Saving water
- Saving Time
- Saving man power
- Optimal water supply to plant/crop.
- Automatic Operation.
- High Efficiency.

LIMITATIONS

Solar panel capacity is low so recharging time by only solar is more. It can chargeable only from solar panel. So there is restriction on rainy season.

FINAL LOOK OF PROJECT



Photograph no.1: Final look of project

RESULT

The result of this project is when the soil is dry at that time motor gets turn ON and when it is wet at that time motor get OFF. We set the certain limit for motor ON and OFF for soil condition. Motor ON or OFF is display on the Display kit.

CONCLUSION

In this project auto irrigation system is used to avoid the excess human efforts and by using solar tracking system we generate the energy and use for irrigation purpose. Therefore there is no need of extra electricity and this reduces electricity bill. It also helps to avoid the wastage of water which essential for now days. This is environmental friendly project. By providing the solar tracker system it improves the efficiency of solar panel. Solar Tracker is designed in such way that it tap maximum sun energy.

FUTURE WORK

We can get some more features like attach multiple moisture sensors, greater water flow system, correct sensitivity of solar tracker, higher efficiency & manufacturing cost can be reduced in mass production.

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