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AUTOMIZATION OF FARMING TECHNIQUES

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ABSTRACT

India is a land of agriculture where most of the people are directly or indirectly dependent on agriculture. In this paper we have tried to present techniques that are required for automizing agriculture. Now a days farmers are facing problems regarding load shading, drought and crop destruction by wild animals. So we proposed automatic solar tracking system. It is used for generating maximum power from sunlight. The other system is automizing irrigation process using moisture sensor. It will solve the problem of water scarcity (drought). And smart crop protection system, aims to address the problem of crop destruction by wild animals. This paper provides an effective solution to this problems, so that the economic losses incurred by farmers are minimized and productivity of farm increases.

Keywords*: solar tracking system, moisture sensor, ultrasonic sensor, PIR sensor, arduino AT mega 328.*

I. INTRODUCTION

Agriculture is the backbone of all developed countries. It uses 85% of available fresh water resources worldwide and this percentage continues to be dominant in water consumption because of population growth and increased food demand. Also now a day's agricultural field is facing lot of problems due to lack of water resources. In order to help the farmers to overcome the difficulties, smart irrigation system has been used. The need of atomizing irrigation system is to avoid over and under irrigation.

This paper further describes the smart crop protection system, which aims to address the problem of crop destruction by wild animals. It describes the problems that are faced by our farmers due to wild animal attack on their fields and crops along with the current solutions and methods that have been adopted to address this problem. It then describes proposed method and explain how this module can solve this problem. The main aim of this system is to provide an effective solution to this problem, so that the economic losses incurred farmers are minimized and productivity of farm increases.

In village areas, as sun is the cheaper source of energy, power generated in this system depends upon the intensity of sunlight and angle of incidence of tracker and sun rays. Efficiency of power generated in this system is generally greater than the conventional solar system, because this method will continuously track the solar source and will adjust itself automatically with the position of sun.

II. LITERATURE SURVEY

In paper "Animal Detection System in Farm Areas",Vikhram.B and Revathi.B [1], had proposed an idea of crop protection by detecting movement or presence of animals in the farm by using ultrasonic sensor and PIR sensor and send the signal to the controller accordingly the controller takes decision and sends a text message to the owner using GSM module R.Nandhini and S.Poovizhi proposed method in paper "Arduino Based Smart Irrigation System Using IOT" [2], in which they have used Soil moisture sensor, GSM Module. Moisture sensor were placed in the roots of the plants to detect the moisture level of the soil. This data were compared with the reference level and the controller makes the decision and accordingly the relays were controlled to make pump on and off.

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Nikesh.D.Watane andRakesh.A.Dafde in there proposed method in its. "Automatic Solar Tracker System"[9] have used four quadrant sensor, light dependent resistor (LDR), Automatic Solar Tracking System (ASTS) in order to get maximum efficiency of the system it needs to receive maximum intensity of sunlight. This system can be manually controlled by GUI as a result it can be maintained at any desired angle.

III. WORKING

This paper proposed almost total atomization of previous farming techniques by resolving problems like load shading, drought and protection of crops from animals.

In this module of paper we have worked on above mention techniques which will be benefited for the farmers. As by atomizing most of the manual or labor work can be overcome.

This system works as follows:

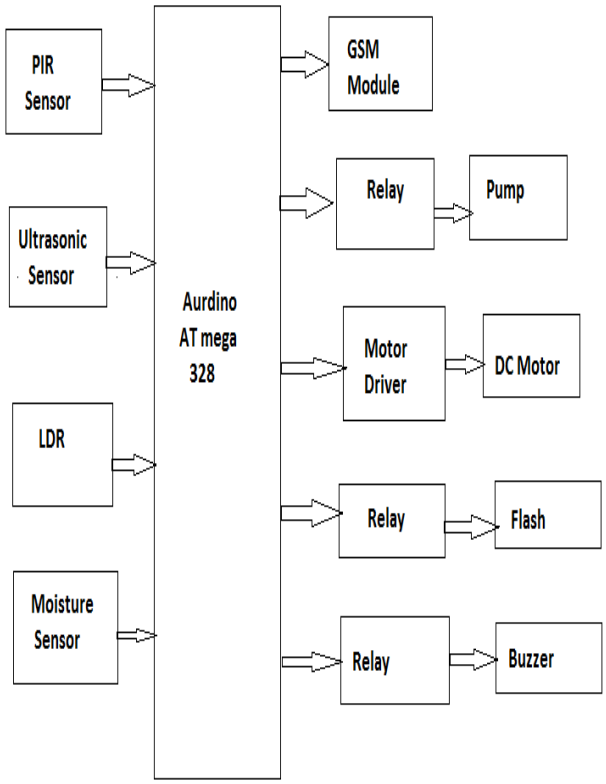

Fig (a) Block diagram of total system

In this system there are three section i.e., Input Section, Processing Section and Output Section. Under Input section various types of sensors such as, PIR sensor, Ultrasonic sensor, LDR, Moisture Sensor are used. Using all above sensors we acquire status of various input conditions in the form of signal.

PIR and Ultrasonic sensors are used for detecting the movement of animals or any object. Whenever any animal passes in the range of these sensors they will sense them and it will give the input signal to the Arduino.The controller will process that input signal and generate the output signal which is given to Buzzer and Flash.

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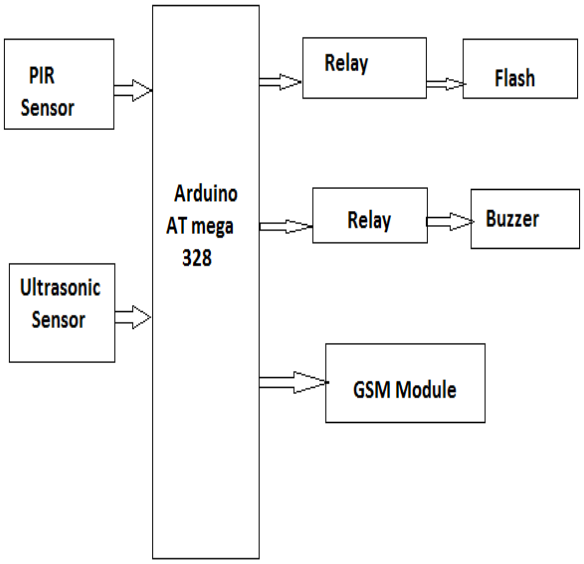
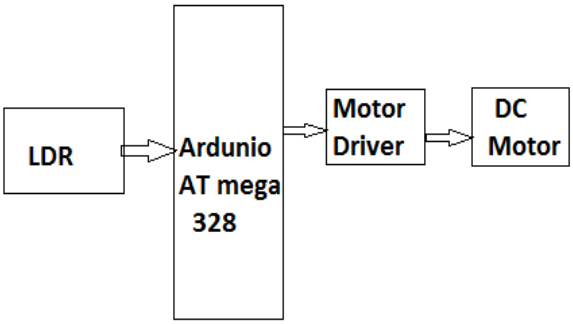


Fig (b) crop protection technique

During the day time when any object or animal is detected then Buzzers will be activated, with the sound of buzzer we can keep animals away from the field. And during night time along with buzzer, flashor light will be in on mode. There, we use the GSM module by using that module farmer can get the information regarding the presentation of any animal in the farm. Here GSM module gives a message to a farmer.



Fig(c) Block Diagram of solar tracker.

Light Dependent Resistor (LDR) is used for detecting intensity of sunlight. We have used two LDR's for continuous Tracking of sunlight they will continuously sense the sun rays and will generate signals which is given to the arduino board. Depending upon the received signals from both LDR's ,the controller will make decision by processing those signals and will drive the motor.With the help of motor driver in direction to maximum intensity sun rays as detected by the LDR's. The efficiency of the the system can be improved by maintaining modules are adjusted to an optimum angle. The block diagram for above process is as shown in fig(c).

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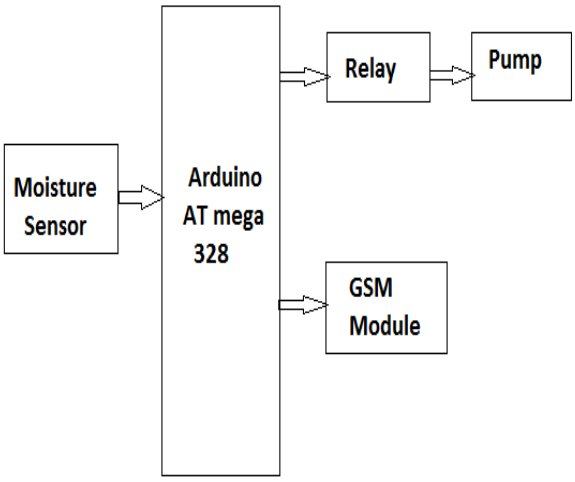

Fig (d): Block diagram of automated irrigation process.

An automated irrigation system is needed to optimize water use for agricultural crops. Moisture Sensor will sense the moisture content present in the soil. Basically if soil has present of more water content then a soil is more conductive. Using that principle moisture sensor gives the input signal toward the Arduino. There we set the reference value using that reference value Arduino take action. If water content are present in soil in a sufficient amount which we have set with the help of the reference value. Then Ardino generate the output which are given to the relay. With the help of that relay the motor pump get automatically on or off. Here the GSM module use for getting the information about the status of the irrigation process a farmer know the status of the irrigation. The block diagram of the process is as shown in the fig (d);

IV. CONCLUSION

This complete automated farming system works with three different modules likeautomaticsolar tracking module which resolves the problem of load shading in remote areas. The LDR'S used in the tracker captures the maximum intensity of sun rays , relatively the electricity produces depends upon the intensity of light along with the optimum angle between the tracker and the solar source i.e. (SUN). 'Smart Irrigation System' is used for the optimization use of water in agricultural field without the intervention of farmer by using soil moisture Sensor that senses the moisture content of the soil using arduino that turn ON/OFF the pump automatically according to the need of water for irrigation and hence helpful in saving water. This system of irrigation is also helpful in the region where there is scarcity of water. And the last module describes the crop protection module using ultrasonic sensor and PIR sensor which detects the animals in the field and inform the whole process by sending a text message and ringing the alarm (buzzer).

V. FLOWCHART

The flow chart of the work is shown in the fig(e). In that various sensor will be the input and that gives the output to the controller .The Arduino is working as the main CPU .It take input from the sensors and then controlled the different outputandparameters

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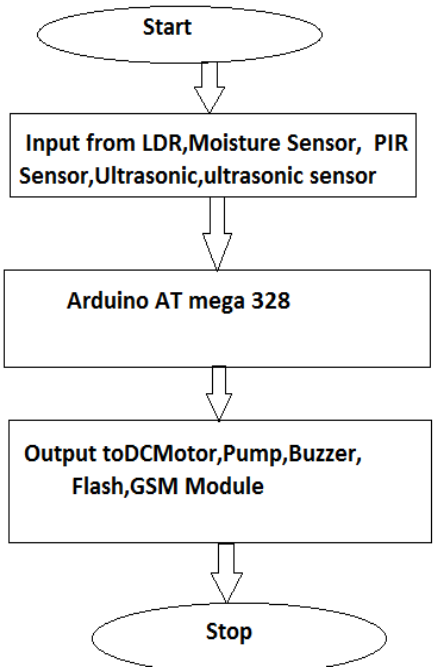

Fig (e) flow chart of overall system

VI. FUTURE SCOPE

For the more advancement in this system the IOT can used. IOT can control this overall process from any location and any time with the help of the internet. In that system we can also developthe module for monitoring the crop automatically. With the help of crop monitoring farmer can know the all problem regarding to the crop. In that system one module can

add which will measure the PH value of the soil using that value farmer can use proper fertilizer for getting the more result. One app can also develop for getting the update information regarding the market to know the market status

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