

## Role of Solar Source for the Development of Agricultural Sector in Multidimensional Way

Khushbu A. Singh<sup>1</sup>, Ashwini P. Rathod<sup>2</sup>, prof.S.Y.Kamdi<sup>3</sup>

<sup>1</sup>BE. Department of Electrical Engineering .Rajiv Gandhi college of Engineering Research & Technology. Chandrapur (M.S.).India

<sup>2</sup>BE. Department of Electrical Engineering .Rajiv Gandhi college of Engineering Research & Technology. Chandrapur (M.S.).India

<sup>3</sup>Professor, Department of Electrical Engineering. Rajiv Gandhi College of Engineering Research & Technology. Chandrapur(M.S).India

Date of Submission: 02-06-2020

Date of Acceptance: 17-06-2020

**ABSTRACT:** Crops in the farm are many times ravaged by animals like buffaloes, goats monkeys, insects, This leads to losses for the farmers .It is not possible farmer to barricade entire field or to stay on field 24 hours and guard it.So here we propose smart automatic crop protection system from animal and insect.We propose the method use to protect the farmer land from animal and insect by using different aspects like mechanical noise system like solar fencing lightning etc .Wild animal are special challenge for farmers. Animal like pig, monkey and insects,cause serious damage to crops.We are presenting a practical procedure towards them off,by creating a system which studied the behaviour of the animal can be detecting by the PIR sensor and at the very same time the sensor activates the whole system starts executing the process. For animal the detection by PIR is use so they enters in radius of it, the noise is produce to distract and get them back from crop lands are not always in fever of farmer so if any hoe animals enter in the range does not effect by the sticking the solar fencing will ensure the safe gardening at very best by not allowing them to wonder inside . In our proposed system we are also introduce the concept of soil irrigation system. By using soil moisture sensor we sense the moisture content in the soil this method save the time of farmer, also we are doing solar based electric fencing and lightning by both purpose we can protect agriculture from animal and by harmful insects from damaging the crops.

**KEYWORDS:** PIR Sensor, soil moisture sensor, relay driver L293D, Microcontroller, Solar panel

### I. LITERATURE SURVEY

Prevention of Wild Animals Entering into the Agriculture Fields Bindu D and Dilip Kumar M D et al describes in this paper, the conservation of crop field has been a main content and a complex issue. The animals from the protected area [PAs] are

continuously attacking the crop field over the years and the protection of this crop field has become a main concern. The techniques that already being used is ineffective, in this article we are presenting a practical procedure toward them off, by creating a system which studies the behaviour of the animal, detects the animal and creates the different sound that irritates the animal and also alerts the authorized person by sending a message. We also provide a multi-class classification by presenting zero false alarm rate and accurate species identification.

### II. INTRODUCTION

In the world, the economy of many countries is dependent upon agriculture. In spite of economic development agricultural is the backbone of the economy. Agriculture is the main stay of economy. It contributes to the gross domestic product. Agriculture meets food requirement of the people and produces several raw materials for industries. But because of animal interference, there will be huge loss of crops. Crop will be totally getting destroyed. There will be large amount of loss of farmer. To avoid these financial losses it is very important to protect agriculture field or farms from animal. To overcome this problem, in our proposed work we shall design a system to prevent the entry of animals into the farm. Our main purpose of project is to develop intruder alert protect the crop from damaging that indirectly increase yield of the crop .meanwhile this system consist of four major reliefs for farmer that is protection by animals with use of mechanical noise system ,automatic irrigation system, electric fencing and lightning. The develop system will not be harmful and injurious to animal as well as for human beings.

### III. METHODOLOGY

#### [1] ANIMAL PROTECTION USING MECHANICAL NOISE SYSTEM

In the proposed system crop monitoring is done where sensor are used to collect the information in the agriculture field. In our proposed work 2 PIR sensor are connected in the system which covers area of 180 degree of total area, as we know one PIR sensor cover the 90 degree angle by using 4 PIR sensor we rescue can the total area. when animal comes in the range of PIR sensor it detect the moment of animal after getting the input signal it give signal for the further processing unit. The signal is given to the microcontroller and our system will response immediately and activates the mechanical noise system through relay. After a quick detection by PIR sensor, if an animal continuously in action towards the crops then the solar electric fencing will be activated through microcontroller. Wild animal are a special challenge for farmer throughout the world. wild .Animal such as monkeys ,and many others may causes serious damage to crops. They can damage the plants by running over the field and trampling over the crop. Therefore , wild animals may easily cause yield losses, so by mechanical noise system we can protect farm from monkeys.

#### [2] AUTOMATIC IRRIGATION SYSTEM

Water is very important resource in irrigation system. Efficient use of water helps in saving the water. Efficient watering helps in getting better yields, improve crop quality. Various methods are available to measure soil moisture content. From all methods the quickest and better one is with the use of soil moisture sensor electronic devices. For better production it is necessary to monitor soil moisture content continuously in the irrigation fields.

When water content in the soil is less the output from the soil sensing arrangement is given to the analogue input pin of the microcontroller .This will triggered the microcontroller and display appropriate message on the LCD and the microcontroller , which is connected to the base of the transistor , is high . When the transistor is turned on, the relay gets energised and turns on the motor. The LED is turned on and acts as an indicator. When the moisture of the soil reaches the value, the output of the soil sensing arrangement is low and the motor is turned off. When the moisture content in the soil is high the microcontroller displays a message mentioning the same and the motor is off.



#### [3] ELECTRICAL FENCING

The first priority is given to the mechanical noise system if it fail to operate then as a backup protection we are using an solar electric fencing. The purpose for making such system is to save life of animal and human due to shock. This system saves the energy which continuously used in solar electric fencing. In our project fencing is done with capacitors which give a small amount of shock to the animal. The capacitors will charge and discharge alternatively which reduces the requirement of current in the system and saves the energy.



#### [4] SOLAR BASED LIGHTING IN AGRICULTURE

In agriculture use of pesticides have direct impact on food production by chewing the leaves of crop plants, sucking out plant juices, boring within the roots, and stems or leaves. Most of the farmers do make use of chemical pesticides for Protecting plants or crop yields against all harmful organisms but it doesn't outcomes effectively 100% and it affects straight to the mankind. So we are doing lightning technique to overcome this problem.

The big flies or hoppers that will assembles on the lightning setup will consume the small harmful insects like bollworms ,maggots& etc present in the crops so in this way the use of

pesticides will be reduced . As we have proposed a chemical free technique we will get the better yield.



#### IV. DESIGN KEY PARAMETER

##### 1]-2 PIR SENSOR:

PIR sensors are more complicated than many of the other sensors explained in these tutorials (like photocells, FSRs and tilt switches) because there are multiple variables that affect the sensors input and output. To begin explaining how a basic sensor works, we'll use this rather nice diagram. The PIR sensor itself has two slots in it each slot is made of a special material that is sensitive to IR. The lens used here is not really doing much and so we see that the two slots can 'see' out past some distance (basically the sensitivity of the sensor). When the sensor is idle, both slots detect the same amount of IR, the ambient amount radiated from the room or walls or outdoors. When a warm body like a human or animal passes by it first intercepts one half of the PIR sensor, which causes a positive differential change between the two halves. When the warm body leaves the sensing area, the reverse happens, whereby the sensor generates a negative differential change. These change pulses are what is detected.

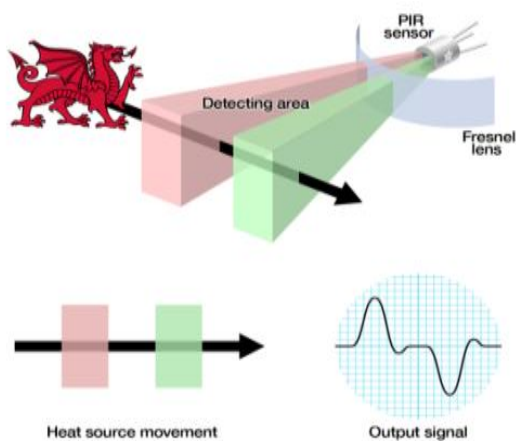


Fig: PIR sensor

##### 2] SOIL MOISTURE SENSOR-

Soil moisture sensor measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighing of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content.

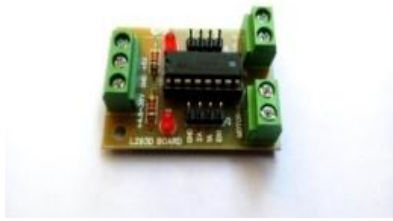
The relation between the measured property and soil moisture must be calibrated and may vary depending on environmental factors such as soil type, temperature, or electric conductivity. Reflected microwave radiation is affected by the soil moisture and is used for remote sensing in hydrology and agriculture. Portable probe instruments can be used by farmers or gardeners.



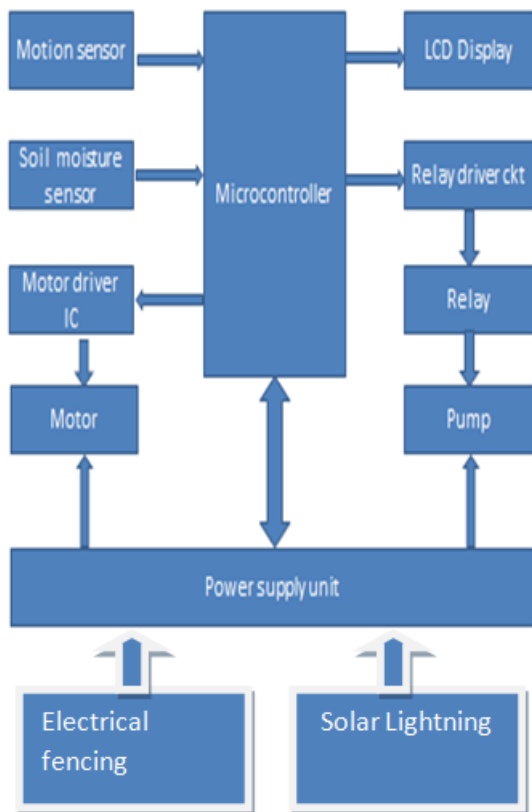
**Application of soil moisture sensor:** Measuring soil moisture is important for agricultural applications to help farmers manage their irrigation systems more efficiently. Knowing the exact soil moisture conditions on their fields, not only are farmers able to generally use less water to grow a crop, they are also able to increase yields and the quality of the crop by improved management of soil moisture during critical plant growth stage.

##### 3] RELAY DRIVER L293D:

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit (IC) L293D Motor Driver ICL293D IC is a typical Motor Driver IC which allows the DC motor to drive on any direction. This IC consists of 16-pins which are used to control a set of two DC motors instantaneously in any direction. It means, by using a L293D IC we can control two DC motors.



**BLOCK DIAGRAM**



**V. CONCLUSION**

The progress in science and technology is nonstop process. New thing and new technology are being invented as the technology gross day by day,

we can imagine about the future in which things may occupy every place. The proposed system based on Atmel micro controller is found to be more compact, user friendly and less complex which can be used in order to perform. Several tedious and repetitive tasks due to the probability of high technology used in this solar fencing unit and alarm for animal entry prevention is fully software controlled with less hardware circuit. The future makes this system the base of future systems; the principle of development of science is that nothing is impossible.

**REFERENCE**

- [1]. Nirdosh Kumar, Mrs. Shimi S.L., -Smart farming system for Indian farmers using Arduino based technology, International journal of advance research ideas and innovation in technology, [IJARIIT]-ISSN:2454132x Impact factor:4.295 Volume:3 issue :1 march -2016 [www.ijariit.com](http://www.ijariit.com)
- [2]. S. Santhiya<sup>1</sup>, Y. Dhamodharan<sup>2</sup>, N E. Kavi Priya<sup>3</sup>, C S. Santhosh<sup>4</sup>, M. Surekha<sup>5</sup>, 1, 2, 3, 4 UG Student, Knowledge Institute of Technology, Salem-637504 5 Assistant Professor, Knowledge Institute of Technology, Salem, International Research Journal of Engineering and Technology (IRJET) , Issue 3, march 2018
- [3]. Y. Hao, B. Campana and E. Keogh.- Monitoring and mining animal sounds in visual space, journal of insects behaviour, 26(4):-493, 2012.
- [4]. Artur Frankiewicz; Rafal Cupek. "Smart Passive Infrared Sensor - Hardware Platform" Year: 2013 IECON 2013 - 39th Annual Conference of the IEEE Industrial Electronics Society Pages: 7543 - 7547

Khushbu A. Singh, et. al. "Role of Solar Source for the Development of Agricultural Sector in Multidimensional Way." *International Journal of Advances in Engineering and Management (IJAEM)*, 2(1), 2020, pp. 59-62.



**International Journal of Advances in  
Engineering and Management**  
**ISSN: 2395-5252**



# IJAEM

**Volume: 02**

**Issue: 01**

**DOI: 10.35629/5252**

**[www.ijaem.net](http://www.ijaem.net)**

**Email id: [ijaem.paper@gmail.com](mailto:ijaem.paper@gmail.com)**