

# Automated Irrigation System for Poly house

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**Abstract:** - Agriculture department have a major role in India to develop towards farming which is about 70% of population. India's growth relies on farming, the capital income in farming department is one third of total nation's capital income. Now a day the agricultural field plays an important role due to the demand in increasing population globally. Poly house is a way of protecting cultivation on agriculture, the plastic is used to cover the structure and it enables to cultivate high value crops in the farming structure. Soil condition is much needed asset for an efficient agriculture production. To improve the soil condition, we have introduced a line follower Robotic car which will move and sense the soil condition and supply water based on soil condition on the field. This project provides a solution in terms of reducing human labour on farming sector. One of the most beneficial thought is that decreasing the human physical efforts.

**Key Words:** — ATmega16, Poly house, Robot, LDR.

## I. INTRODUCTION

In a growing population nation an Agriculture Department is a key asset, it plays a vital role in the development of farming. Due to technical challenge and limitation on Agriculture field there are many concerns arises in farming industry. To avoid such problems and constraints we have introduced this project which provides a better and qualified solution to help farmer in terms of less human labor, low maintenance, cost effective and user friendly automated technology. Among various method Poly house is way of protected cultivation on agriculture, a poly house is a tunnel typically made it enables to cultivate high value crops on the structure Poly house farming is same as greenhouse farming. The "poly" part of the name refers to polyethylene plastic, which is used to cover the house & being transparent to sunlight.

A wireless system is programmed by using a microcontroller which is used to monitor the soil condition; also a robotic car is developed by using IR sensor, moisture sensor and motor driver which will be driven in the field of poly house to supply water based on the soil condition. Here a line follower is used for robot moving purpose. The Robotic vehicle is mainly commanded by a Relay switch through an IR Sensor input method. The input language to interact with the robot is easily human understandable. Here we use four moisture sensors in the field of poly house to check the soil condition that is the soil is wet or dry if the soil is dry then at that condition

pulsating valve will be open and supply water. Here we use an automated tank system for watering. Therefore, we developed an automated robotic system which can be used to measure several agriculture procedures like soil level moisture; here an overall hardware description will be presented together with the software design.

The key feature of this robot is it's easy to access and fast data operations. In agricultural autonomous a mechanism has been developed to investigate if multiple small autonomous machines could be more efficient than traditional large tractors and human forces. The aim of this model is to use less human effort and get more efficient output, also to reduce the overall cost in the farming. It is an easy & cost effective method.

## II. METHODOLOGY

The proposed system was based on the microcontroller based program; here ATmega 16 microcontroller was taken. Here in this poly house automation system we take four moisture sensors in the field and a line follower robot is used for watering in the field. In the robot two IR sensor is used for line following, the main objective to used line follower robot in poly house automation system is to move the robot in a fixed line and it also save the power of the battery and a motor driver is used to drive the motor, here L293D motor driver is mainly used. And LDR is used in the robot for signal

detection & a 1000 micro farad capacitor is used for filtering purpose i.e. to convert pulsating DC to pure DC, & an automated tank will be used in the robot for watering purpose.

Here in the field four moisture sensors is used for checking the moisture level in the field. Here a line follower robot is move from its initial position, here in the robot a tank is used for watering purpose, to move the robot in the field we should first fill up the tank at its initial position, and then only the robot can start moving. By using pumping, we can fill the tank. Here the timer will be set for pumping purpose. Here a level control is used in the tank to check the water level. Here a IR sensor is used for indicating purpose, i.e. when the water level going upward then IR reflects and gives signal to the pump that the tank will be full then at that moment the pumping will be stop, and the robot start moving towards the field. Here in the field when the moisture is present then the pumping will be turned off and when the moisture is not present then the pumping will be turned ON and start watering to the field.

When the water level is down and the tank is empty then the robot will start moving towards its initial position to fill up the tank. And going towards the field and this process will remain continue.

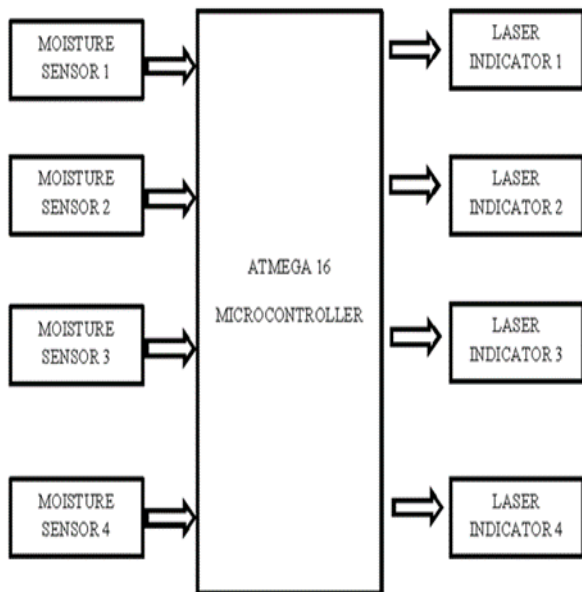


Fig.1. Block Diagram of Field

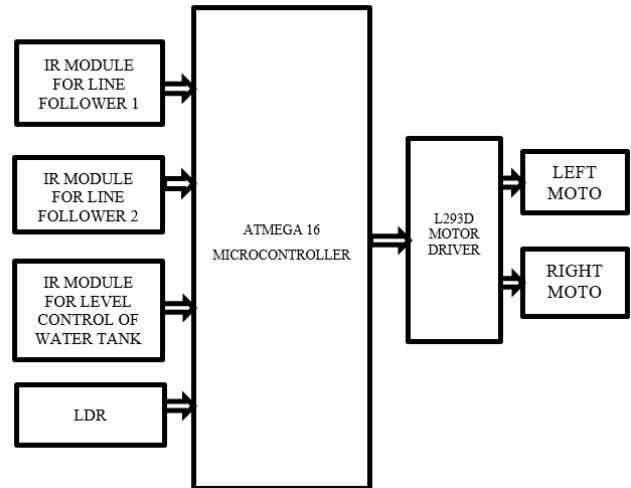


Fig.2. Block diagram of Robot

### III. RESULTS AND DISCUSSION

The system is designed and tested under realistic working conditions. FIG (1) shows that when the moisture is not present in the field soil then the robot should appear near to the laser. At that moment the laser will be detected by the LDR & the laser program will be turned ON. Once the laser is turned ON the pumping will be started and start watering the plants or the soil that they are growing in.

FIG (2) shows that when we give water to the field soil then the moisture sensor senses the moisture level of soil. In other words, when moisture is present then the laser will be OFF.



Fig.3. Field Robot with water tank

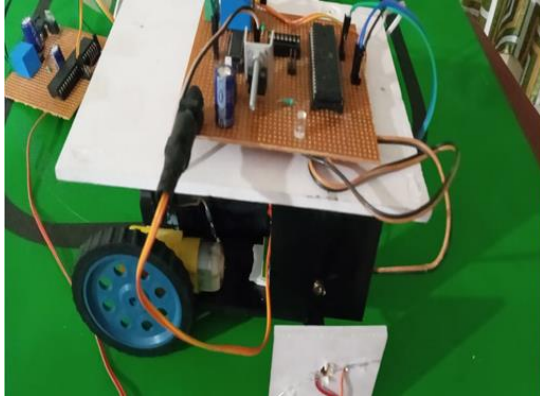


Fig.4. Field Robot with LDR System

#### IV. CONCLUSION

The suggest system can mainly use to reduce the human labor in agricultural field, this is an easy & cost effective method, by using this technique we can also save our time. The proposed system provides complete automation system using different sensors. These method yields more crops than the existing method. The water supply is feed through the water vehicle to the plant. As a result, the crop will yield more quantity without infection in terms of insect. By using this automated poly house technique, we can cultivate more numbers of crops with in a limited time period and also we can cultivate the off seasonal food, flower also. By using wireless module and camera we can also monitor and control the system from anywhere.

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