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AGRICULTURAL AUTOMATION ROBOT USING ARDUINO

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Abstract: **This project go to develop a robot capable of performing operations like automatic plowing, seed sowing, fertilization and water spreading. The qualitative development of this project is request for a system which minimizes the working cost and reduces the time for digging task and all this task run by using solar energy to run the agricultural robo. Development aim of this device is that can atomically actions on agricultural operations. Today farmers pay lot of money for machines that help them to decrease labor and increase income of crops but efficiency and profit are less. Hence automation is the ideal solution to decreases all the failing by developing machines that perform one operations and automating to increasing the income on a large value.**

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I INTRODUCTION

Today the environmental influence of agricultural production is very much in focus and the demands to the industry is increasing. In the present scenario, most of the cities in India do not have sufficient skilled man power in agricultural sector and that effect on the growth of developing country. Hence farmers have to use new technology for farming activity like (plowing, seed sowing, fertilization, water sprinkling, etc.).Seed sowing Machine which developed so long are operated manually or there is no Smart Work done by it thinks seed sowing. Basic method is that seed sowing carry by hand this is also known as dibbling i.e. the making of holes and then by hand dropping the seed .also there are slot are make for used the large equipment like leveling and dropping . So it's time to automate the sector to decreases this problem. There is a need to study on new agricultural equipment system.

Figure 1: Traditional Method for Plowing in Agriculture

New originate idea of this project is doing the growth of Plowing, seed sowing of crops and fertilization, water sprinkling which is covering the land automatically so that human power will get reduce up to 90%. Agricultural Robots is a robot developed for doing agricultural work. The energy uses for robotic machine is minimum then other machines like other agriculture tool and also this energy is developed from the solar energy which is found in nature .Now a day robotics is important in all fields like industrial, medical, and other one fields. The main application area of robots in agriculture is at the harvesting stage and Seed Sowing Stage. Driverless robots are designed to replace human power. The data logger through Wi-Fi module on web server increases the effectiveness of the system so that surveillance of all actions will be maintained. The future scope for this project is not only detecting obstacle but also avoiding it successfully without disturbing the main course of the system.

In this project, the robot system is used to develop the process of cultivating agricultural land without the use of man labor. The aim of the paper is to decreases the man labor, time and increases the harvesting. In today's generation number of the countries does not have enough human labor in agricultural sections and it affected on the growth of developing countries so it's time to automate the sections to less this problem. In India, there are 70% people dependent on agriculture. So its important to study the agriculture. Innovative idea of this project is to automate the process of sowing crops such as groundnut, sunflower, and baby corn

and so on. The farming system like plowing, seed sowing, fertilization, water sprinkling, etc is the different process. All the processes are advance to increase the farming mechanism which works without the man labor need. There are small devices developed and they need use of less knowledge and equipments .Seeding preparation is our day to day life we use tractor in farms, but it uses more time and the man shortage is faced continuously. It also uses large power that can be decreasing with this system.

Speed of the DC motor which is an electrical component by using a delay in the source coding. We are motivated for doing this project because of today's agricultural problems and here we get to deal with the controller, its interfacing with the dc motors, interfacing with the ultrasonic sensor, a linear actuator which is used for opening and closing of the valve required for the dart of seeds and so on.

II LITEARETURE SURVEY

[1]Agricultural mechanization was started just after the world war I1 for the purpose of increasing the food production. It was focused on the rice production because it was one of the most important, stable, main crops for Japanese people and developed quickly and progressed accompanied with the background of rapid industrialization. The technology has progressed and some practical prototype robotic machines can be seen currently, however it will take more time until they are distributed and accepted in the level of commercial base. In addition to the reduction of the price, and the technological improvement of performance and capacity, the p roduct liability must be considered seriously. [2]In this method the farmers themselves verify all the parameters and calculate the readings. It focuses on developing tools to manage displays and alert the users using the advantages of a wireless sensor network system. [3] Small scale effort but the same can be implemented with enormous results in a large scale that benefits all farmers of the world. Apart from sloughing, seed dispensing, spraying pesticides and fruit picking other farming process like harvesting, irrigation Mobile Agricultural Robot Swarms (MARS) is an approach for autonomous farming operations by a coordinated group of robots. One key aspect of the MARS concept is the low individual intelligence, meaning that each robot is equipped with only a minimum of sensor technology in order to achieve a low cost and energy efficient system.

III BLOCK DIAGRAM

Figure shows the block diagram of Agricultural Automation Robot. It consist of ARDUINO MEGA 2560 microcontroller, Solenoid valve, relay and its driver, solar panel, battery, charging unit, server motor with its driver, plowing driver unit, sprinkling value and tank. The block diagram of Agrirobo consists of Arduino Mega2560 which is controller for the whole assembly as shown in Fig.2 and solar Panel is attached with the lead-acid battery for storing energy and further it is given to power supply circuitry which is providing +5V for Arduino board and +12V supply for driving DC motors using l293d.Servomotor is used for Seed Sowing and is connected with Arduino and wirelessly with Android Smartphone to controlling the whole assembly. The hardware of agrirobo is mounted on Chassis which is 28cm long and 22.5 cm wide.

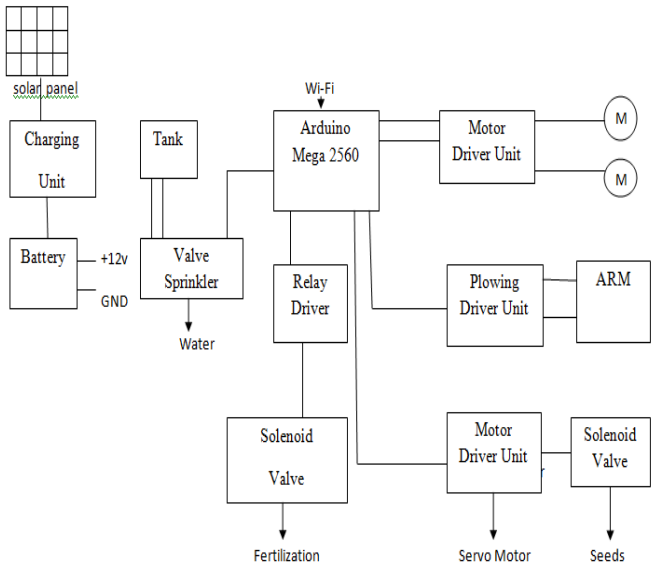

Figure 2: Block Diagram

IV WORKING

In this system we are operating all control systems like plowing, seed sowing, sprinkling and fertilizing through wireless communication and battery operated system using solar panel.

We will control our robot through android app within a wireless range of communication. First we will plow the field using joystick controlled through mobile application. It will send signals to microcontroller and accordingly motor is operated wireless. After plowing we will check the moisture of soil using soil moisture sensor which will provide various moisture levels. If it is exceeded above the threshold level it will operate the robot automatically. Then microcontroller automatically operates on time based without any human intervention. Robot will slow the fixed quantity of seed to the entire row and seed sowing varies depending on the types of seed. After sowing the seed, robot will control the water sprinkling mechanism to the soil. Automatically microcontroller gets a signal to actuate water sprinkling which is controlled by DC motor. After that microcontroller will turn off the water sprinkling and will turn on the motor which in turn will fertilize. Here we have used a liquid type of fertilizing. Thus our microcontroller automatically controls the output devices according to input signal. Our robot is

controlled by solar operated battery which also indicates the charging, discharging and fully charged to farmers.

V CONCLUSION

We have developed an Agricultural Automation Robot using Arduino. An initial outcome of this study indicates that most of these systems that which work autonomously are more flexible than traditional systems. The benefits of reduction in labor costs and restrictions on the number of daily working hours significantly improved. Thus it has made possible to automate the most significant working routines. The project presents a low cost, low power & simple system for device control. This system will have high application in farming, gardening and agriuniversity. The chassis handles the complete weight of solar panel, battery and the hardware mounted on Agrirobo which is able to perform each and every operation skillfully and successfully.

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