# International Journal of Research Publication and Reviews

# Multiseed Sowing Machine Using Android App and Solar Panel

*Saurabh P. Bondre [1], Jyotiram P. Gade[2], Vikas V. Mane[3], Dnyaneshwar A. Saste[4] , Ganesh R. Padule[5]*

[1,2,3,4] *UG Student, Electrical Engineering Department, S. B. Patil College of Engineering, Indapur (MH), India,*

[5]*Professor, Electrical Engineering Department, S. B. Patil College of Engineering, Indapur (MH), India*

[1]*saurabhbondre714@gmail.com,* [2] *gadejyotiram111@gmail.com,* [3] *vikasmane1789@gmail.com,* [4] *dnyaneshwarsaste70@gmail.com,*

[5] *ganeshpadule88@gmail.com*

**ABSTRACT-**

The equipment utilized to carry out the aforementioned tasks in traditional agricultural methods is costly and difficult to use. Therefore, advanced technology are necessary for farmers to carry out agricultural tasks.

Designing and creating a robot that can carry out tasks like watering and seeding is the aim of this project. This robot doesn't require an external power source because it is powered by a solar panel. The entire system is managed by an Android application that connects to an Arduino UNO via Bluetooth, sending messages to the robot for the necessary mechanisms and movement. A dc motor is used to autonomously plant the seeds. For seeding, a constant distance is maintained. Crops are irrigated via sprinklers. Its revolving nozzles are used to mist crops with water.

This robotic vehicle will improve job speed and precision while reducing personnel costs. It is economical since it involves several operations. Compared to tractors or other agricultural equipment like electric pumps, this machine uses less energy.

*Keywords-* *Solar Panel, Dc Pump, Bluetooth Module, and Arduino UNO, DC Geared Motor.*

## I. INTRODUCTION

Seventy percent of Indians pick agriculture as their primary occupation. There is not enough skilled labor in the present generation, particularly in the agriculture industry. Manual farming takes longer and produces more people. The primary goal of creating automation in the agricultural sector is to reduce labor and time needed to process crops, resulting in a 90 percent reduction in human effort. Automation is necessary for worker health and safety, particularly while performing hazardous tasks.

With the advent of smart technologies that seek to boost output, lower labor costs, and optimize resource use, agriculture has experienced tremendous developments in recent years. One such invention is the Multiseed Sowing Machine, which is powered by a solar panel and has an Android app embedded into it. An essential component of contemporary farming, accurate and efficient seed sowing is urgently needed, and this equipment meets that need. Traditional seed-planting techniques can be labor-intensive and time-consuming, which frequently results in uneven seed distribution and reduced yields. By using intelligent technology to automate the sowing process, the Multiseed Sowing Machine is made to overcome these difficulties.

Basic parts of the system include a solar panel, a DC motor, a battery, a relay, a motor driver, a relay driver, an Arduino UNO controller, and a Bluetooth module. The microcontroller controls the entire operation. The battery is charged by the solar panel. This battery powers both the engine used for seed planting and the movement of the vehicle. A microcontroller is used to regulate and change the distance between the two seeds. We can use a Bluetooth command to shift the robot's direction when it reaches the end of the field. This solar-powered multipurpose agri-robot has the benefit of operating solely on solar energy, negating the need for gasoline or fuel. The Arduino controller makes the circuit model smaller and simpler.

## II. DESIGN METHODOLOGY

Designing a Multiseed Sowing Machine using an Android App and Solar Panel is an

Innovative approach that combines precision farming, automation, mobile technology, and sustainable energy.
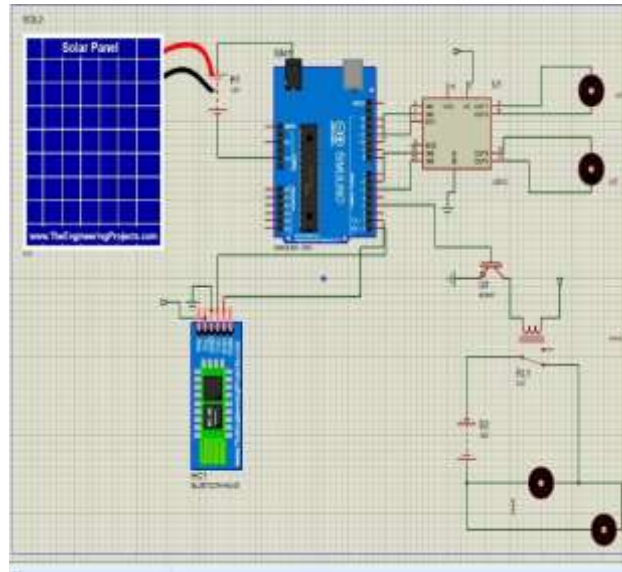
Fig 1: -Circuit Diagram of Multiseed sowing machine

## III. HARDWARE REQUIREMENT

In this project, The Arduino UNO is the main controller that makes all the decisions such as seed sowing, water sprinkling and movement of the robot. The Bluetooth HC-05 is used for the interfacing between android app and controller. The basic elements required for this project are listed below

- Solar Panel

- Arduino UNO

- Bluetooth module HC-05

- Battery

- DC Geared Motor

- Relay Module

- L298 Motor Driver

## IV. SOFTWARE FRAMEWORK

1. Set up Your Arduino Environment

Before you start writing your Arduino code, ensure you have the following:

Arduino Board: An Arduino Uno, Nano, or any other model.

Arduino IDE: Download and install the Arduino IDE if you haven't already.

Connection: Connect your Arduino to the computer via USB.

2. Create a New Sketch

3. Understand the Structure of the Arduino Program

4. Define Pins and Variables

5. Write Setup Code

6. Write Loop Code

7. Upload the Program to Your Arduino

8. Test and Debug

9. Expand the Code (Optional)

10. Final Testing

## VI. RESULTS

1. Increased efficiency in seed planting.

2. Cost savings through solar power and reduced reliance on fuel.

3. Improved yield through precise control and adjustments from the Android app.

4. Sustainability in operations, especially for off-grid areas.

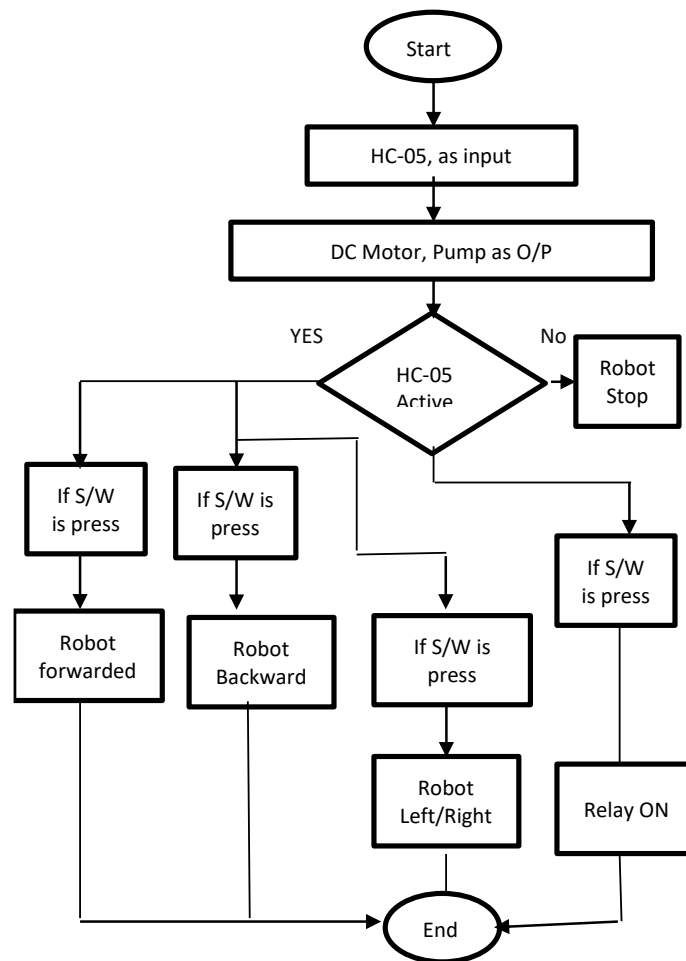5. Positive environmental impact by reducing carbon emissions.

## V. FLOW CHART



Fig 2 –Flow Chart

## VI. CONCLUSION

This Robot is basically designed for the Agricultural field. This will help farmers for Sowing Seeds, Water Sprinkler which reduce the human efforts and work is done simultaneously as per the requirement. This is the low cost machine, which will be easy to handle. By using solar energy, battery is charged and work can be done as per the command. It also helps farmers to reduce the Labour cost. By the use of machineries in this field save time, increase efficiency and indirectly increase the production in farms.

### REFERENCES

1. Saurabh Umarkar and Anil Karwankar In "Automated Seed Sowing Agribot using Arduino", International Conference on Communication and Signal Processing (ICCSP), November 2016.

2.  P. V. S. Jayakrisna In "Autonomous seed sowing agricultural robot", International Conference on Advances in Computing, Communications and Informatics (ICACCI), September 2018.

3.  S. Kareemulla in "GPS based Autonomous Agriculture Robot" International Conference on Design Innovations for 3Cs Compute Communicate Control (ICDI3C), April 2018

4.  Pankaj Kumar in "Design and fabrication of smart seed sowing robot", August 2020.

**Books**

1.  Arduino for Beginners: Essential Guide to Arduino Programming

It provides the foundational knowledge you need to develop, program, and troubleshoot your system.

1.  Arduino Robotics by John-David Warren, Josh Adams, and Harald Molle

The book's hands-on approach will give you practical skills in motor control, sensor integration, autonomous navigation, and wireless communication all of which are essential for your project

**Industry Standards**

1.  **ISO 14001:2015 – Environmental management systems — Requirements with guidance for use**

    o   This standard helps ensure that the system is designed with sustainability in mind. Since the project uses solar energy, implementing ISO 14001 will guide the design of an environmentally-friendly system, with minimal negative environmental impact.

2.  **ISO/IEC 12207:2017** – **Software life cycle processes**

    o   This standard outlines the processes for software development and maintenance. For your Android app and Arduino code, this standard provides guidelines for the software development lifecycle, ensuring that the software is developed and maintained in a structured and efficient manner

**Online Resources and Websites**

1.  Arduino Official Website (for tutorials, documentation, and community discussions):

    o   https://www.arduino.cc

2.  Android Developers Official Site (official documentation for building Android apps):

    o   https://developer.android.com

3.  Solar Power World (guides and news on solar energy, including solar panel selection):

    o   https://www.solarpowerworldonline.com

4.  ISO Standards for Agricultural Machinery (safety and performance standards for machinery like seeders):

    o   https://www.iso.org/standard/67092.html