

# Solar Powered Seed Planter Controlled By Using Bluetooth

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**ABSTRACT:** This paper is focused on an agriculture seed sowing process controlled by using Bluetooth. In digital India technology, it plays a vital role which include Agro-technology which the method of applying the technology innovation occurring in daily life which can be applied to agriculture sector causes to improve the efficiency of the product (rice, wheat, maize, etc.) and can help to develop better seed sowing machine to help the agricultural field. Even now, in our country 98% of the contemporary machines use the power by burning of fossil fuels to run IC engines or external combustion engines. This evident has led to widespread air, water and noise pollution and most importantly has led to a realistic energy crisis in the near future. The problem focused here is direct seeding. The manually operated seed sowing technique associates exposure of seeds to rats, birds and snails. So, it is mandatory to automate this sector and a progressive innovation becomes necessity for raising the demand on agro product quality. It can be reduced the amount of time of work spend on one crop and total cost, labour effects. Seed sowing is the basic operations needed to get better revenue from agriculture. Manual sowing should not give adequate spacing between row to row. Hence in this project deals with the designing and fabrication of better seed sowing machine which is available to the farmer at a cheaper rate and it helps to sow the seed in the farm simultaneously Recently in agriculture, the required manpower is not available as well as the aging farmer and increasing world population are causing a threat to the future. The machine can be controlled remotely and solar panel is used to charge DC battery. Assembly language is used in programming the microcontrollers. The microcontroller is used to control and monitor the process of system motion of vehicle with the help of DC motor.

For that, we are going to automate the seed sowing process. This process has a mobile robot controlled by a Smartphone. This project focuses on developing the mobile robot to minimize the working cost and increase the accuracy of seed planting.

**KEYWORDS:** Seed Sowing, Agricultural Sector, Solar Power, Dc Motor, Solar Panel, Microcontroller, Bluetooth,.

## I. INTRODUCTION

Agriculture has been the backbone of the Indian economy and will continue to remain so for a long time and 70% of people depend on agriculture. It has to support almost 17 percent of world population from 2.3 percent of world geographical area and 4.2 percent of world's water resources. The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and spacing, cover the seeds with soil and provide proper compaction over the seed. In India agriculture was the key development in human civilization causes a remarkable changes in various agriculture practice has occurred over the past with new technology and development. As the major occupation of the Indian people is agriculture, the environmental impact of agriculture with the rising demand to industry is very much in focus. Currently in most of the countries, the skilled man power in agriculture sector is absent and that effect the growth of developing countries. Thus the farmer have to implement the various technology and techniques to overcome this problem by doing automation in various sector so we need to study on improving the agriculture technique. Today the environmental impact of agricultural production is very much in focus and the demands to the industry is increasing. In the present scenario most of the countries do not have sufficient skilled man power in agricultural sector

and that affects the growth of developing countries. Therefore farmers have to use upgraded technology for cultivation activity (digging, seed sowing, fertilizing, spraying etc.). So it's a time to automate the sector to overcome this problem. The energy required for this robotic machine is less as compared with other machines like tractors or any agriculture instrument, also this energy is generated from the solar energy which is found abundantly in nature. Pollution is also a big problem which is eliminated by using solar plate.

Autonomous agricultural robots are an alternative to the tractors found on fields today. Cultivation tasks like seeding, spraying, fertilizing and harvesting may be performed by fleets of autonomous agricultural robots in the future. Independent of the actual design a serious agricultural robot will be a complex and expensive vehicle – the challenge is therefore to prove that it is competitive to traditional technology and may even bring a decisive lead. One critical factor here is the optimal utilization of the robot over the day and over the year. To reach a full utilization the agricultural robot needs to be a vehicle with some basic capabilities and the possibility to support multiple applications. Among the basic capabilities we surely require a navigation system for safe and autonomous navigation. India's record of progress over the past four decades in agriculture has been quite impressive. In the current generation, man power shortage is a major problem specifically in agricultural sector and it affects the growth of developing countries. The progressive invention in agriculture system is becoming an important task because of rising demand on quality of agriculture products and declining labour availability in rural farming areas. Today agricultural robots can be classified into several groups: harvesting or picking, planting, weeding, pest control, or maintenance. Scientists have the goal of creating "robot farms" where all of the work will be done by machines. The main obstacle to this kind of robot farm is that farms are a part of nature and nature is not uniform. It is not like the robots that work in factories building cars. Factories are built around the job at hand, whereas, farms are not. Robots on farms have to operate in harmony with nature. Robots in factories don't have to deal with uneven terrain or changing conditions. Scientists are working on overcoming these problems.

Traditional methods include broadcasting manually. The common practice for digging the fields are by using bull or by tractor and the method of sowing the seeds are by hand. Later, the seeds are sowed in the furrow through a bamboo funnel attached to a country plough. For example sowing seeds in small areas they employ dibbling method i.e., making holes or slits by a stick or tool and dropping seeds by hand is practiced. Later, the multi row traditional seeding devices with manual metering of seeds are quite popular with experienced farmers. It is a large time consuming approach. Besides being wasteful, planting was very imprecise and lead to a poor distribution of seeds.

In this paper, the Bluetooth guided vehicle is developed which is used to automate the process of digging and sowing crops such as sunflower, groundnut and vegetables like beans, lady's finger, pumpkin and pulses like black gram, green gram etc. & to reduce the human effort and to increase the yield. All these process are advanced by modifying the mechanism in farming which is self-guided by giving commands in PC or mobile and sending through a wireless module.

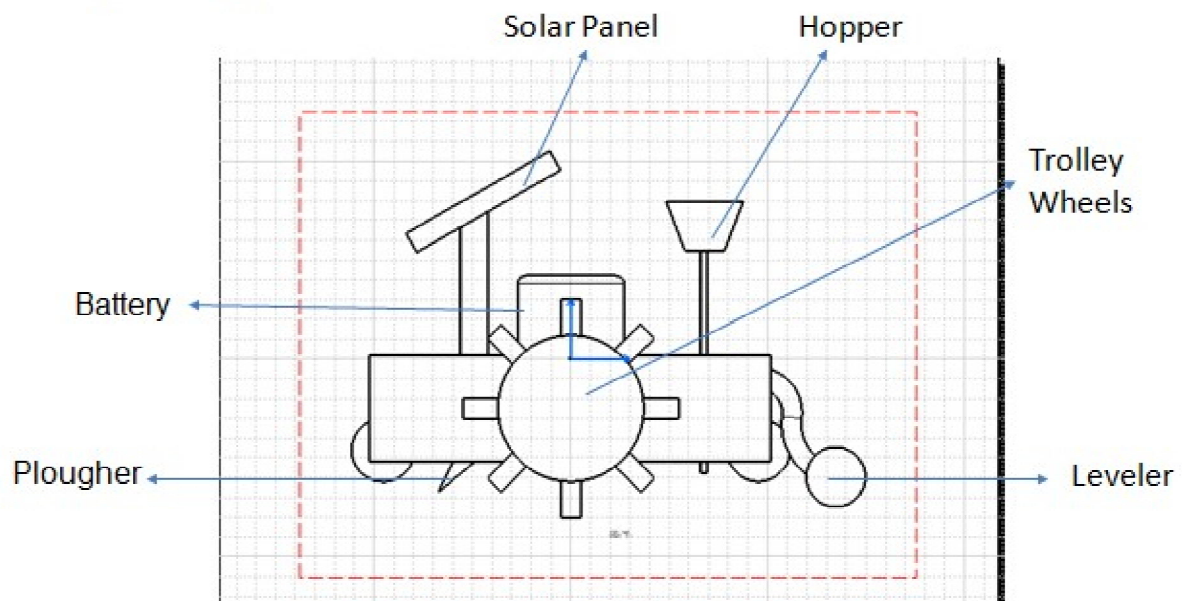
## II. MODULES

The block diagram consists of four main parts. These are:

- Chassis (Frame)
- Microcontroller(Arduino UNO-ATmega328P)
- Blades and Shaft
- Battery
- Electric Dc Motor
- Solar panel
- Bluetooth(HC-05)
- Voltage regulator and Relay(ULN2003)

The Bluetooth based solar powered seed planter with Arduino UNO Board and an Android application is developed. Remote controlled solar powered seen planter provides a simpler solution with Android application technology is achieved by any smartphone/ Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation.

## Conceptual Designs



**Figure 1 : Side View of the Seed Planter**

## Working

- In this machine a solar panel is used to capture solar energy and then it is converted into electrical energy which in turn is used to charge 12V battery, which then gives the necessary power to a shunt wound DC motor. This power is then transmitted to the rear wheel through chain drives. Consequently, in this project an attempt is made to make the electric and mechanical systems share their powers in an efficient way.
- A solar panel is a device that collects and converts solar energy into electricity or heat or mechanical work. Solar energy is first used to charge a storage battery. An electric battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. The solar energy stored in the battery is utilized to operate DC motor. A DC motor is a device that converts direct current (electrical energy) into mechanical energy. By using the Chain drive with sprockets power is transferred to the wheels for their movement. **Arduino UNO-ATmega328PMicrocontroller** is used to automatically control the machine.

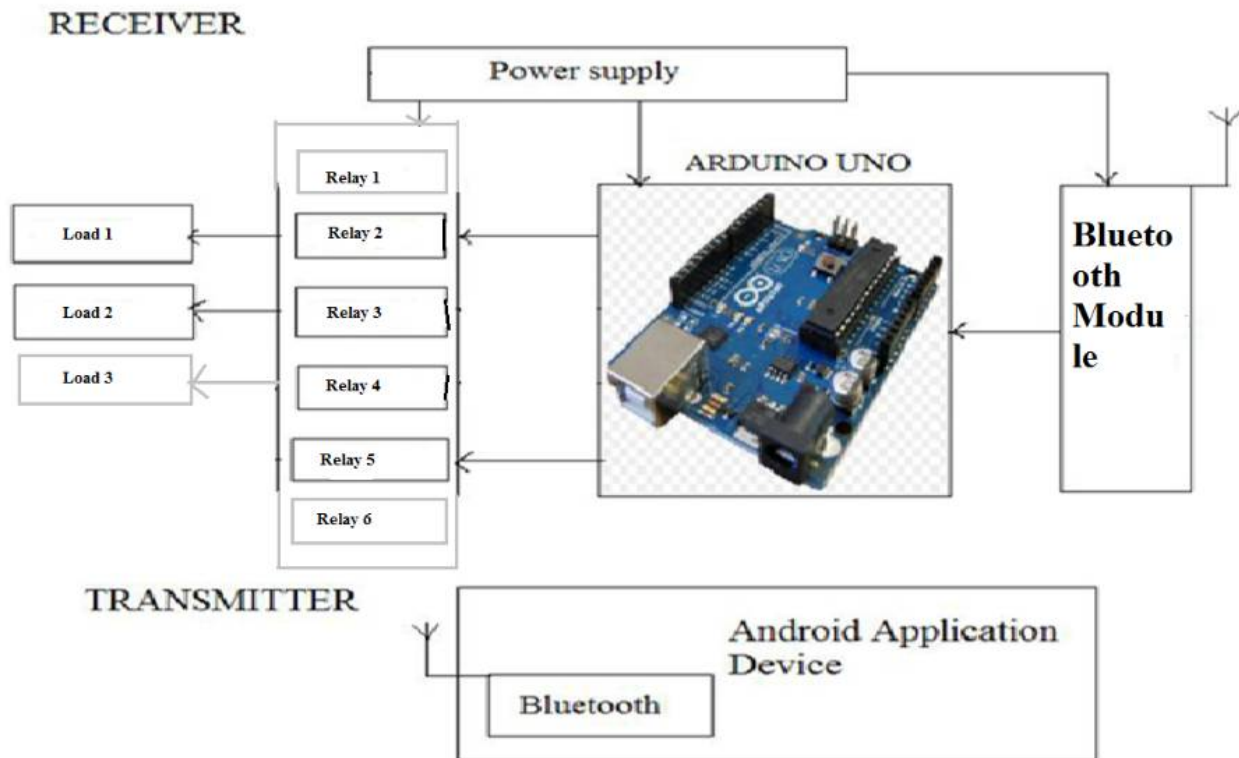


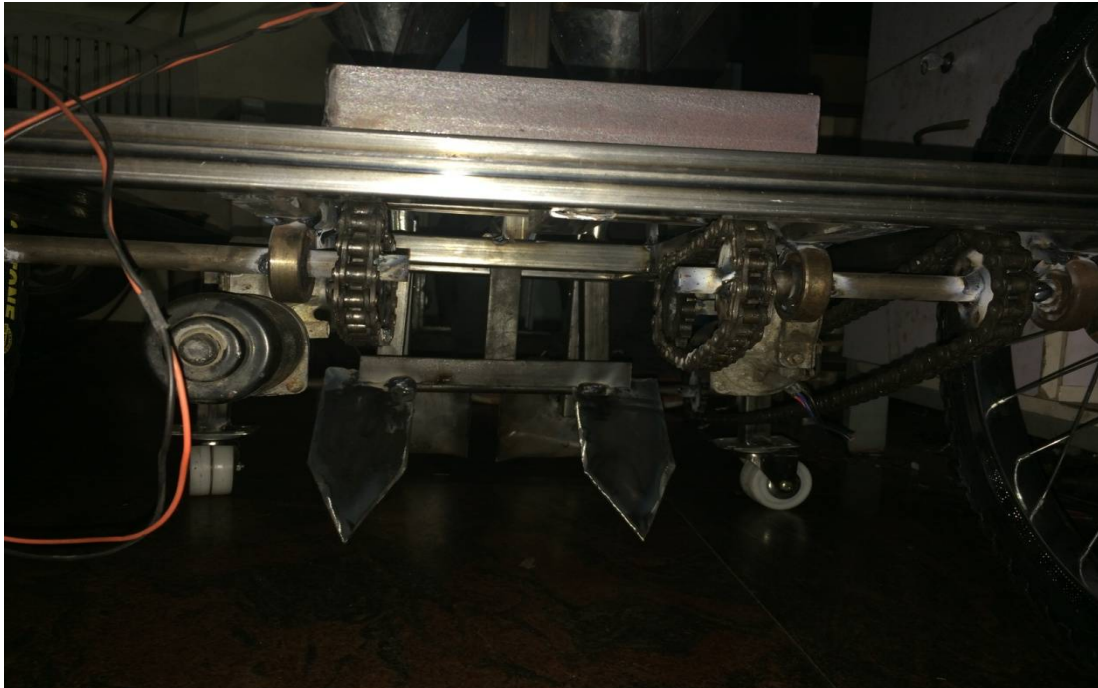
Fig2 Experimental setup

### Photographs of model

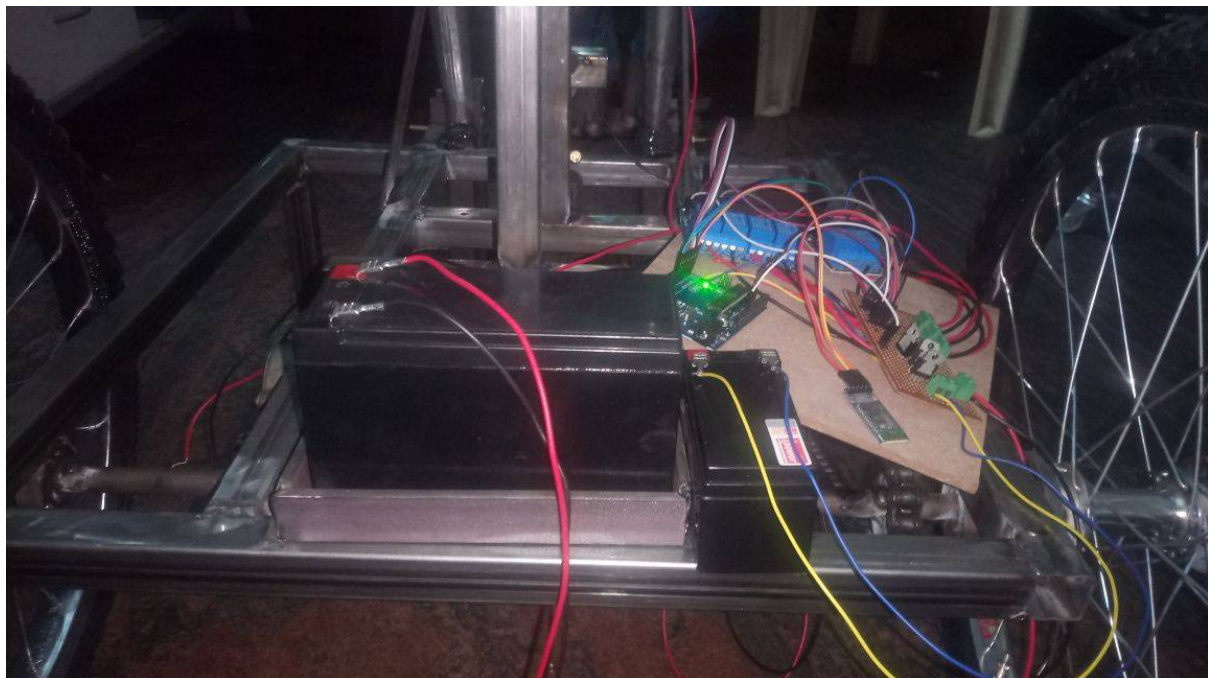


Fig: top view





**Fig: blades and motor**



**Fig: battery and microcontroller**

#### Future scope

- Addition of multiple hopper can be attached side by side for sowing the large farm.
- The work may be done by extending the range of Bluetooth for communication in large farm.
- Also connection of the water sprinkler can be used to moisture the soil.

### III. CONCLUSION

Innovative Seed sowing equipment's has remarkable influence in agriculture. By using this innovative project of seed sowing equipment we can save more time required for sowing process and also it reduces lot of labourer cost. It is very helpful for small scale formers. After comparing the different method of seed sowing and limitations of the existing machine, it is concluded that the this solar powered seed sowing machine can

- Maintain row spacing and controls seed rate.
- Control the seed depth and proper utilization of seeds can be done with less loss.
- Perform the various simultaneous operations and hence saves labour requirement so as labour cost, labour time and also save lots of energy.

Hence it is easily affordable by farmers. So we feel that this project serves something good to this world and we would like to present it before this prosperous world.

### REFERENCES

1. Mahesh R. Pundkar, "A seed sowing machine: A review" IJESS volume 3, Issue 3. ISSN: 2249-9482, International journal of engineering and social science.
2. Sahay (1990), Principals of Agricultural Engineering (2005), Volume 1, Text book published by Jain brothers, New Delhi, India.
3. Gholap, D.D., More, V.M., Lokhande, M.S. and Joshi, S.G. Robotic Agriculture Machine. IJIRSET. 2014. 3 (Special Issue 4).
4. Shrinivas, R.Z. and Kokate, R.D. Advanced Agriculture System. IJRA. 2012. 1(2) 107-112.
5. Chandika, S. Automation and Emerging Technology Development of 2d Seed Sowing Robo. Journal of Agriculture Science. 2009. 1(1).
6. Aji, G.D. and Kulkarni, V.A. Advanced Robotic Weeding System, ITS-TEEE, 2013. 1(3).
7. Zueb, K. Unique Solar Operated Spray Jet. IOSR-JMCE. 43-46.
8. Chengliang, L., Mingjun, W. and Jun Zhou, 2008: Coordinating Control for an Agricultural Vehicle with Individual Wheel Speeds and Steering Angles. Sch. of Mech. Engg. Shanghai Jiaotong University, Shanghai Mingjun Wang, IEEE Control Systems Magazine.
9. Sunil, K.A., Satyashree, G. and Patil, K.N. Solar Flat Plate Collector Analysis, IOSRJEN. 2012. 2(2) 207-213.
10. Ramesh, M.V., Amarnath, J., Kamakshaiah, S. and Rao, G.S. Speed Control of Brushless DC Motor by using Fuzzy logic P I Controller. ARPN. 2011. 6(9).
11. Dong, Y., Huanyong, C., Xijie, T., Qingping, Z. and Pengfei, Xu. Research on Tooth Modification of Spur Bevel Gear. The Open Mechanical Engineering Journal. 2011. 5; 68-77.
12. Jeffrey, W.W., 2004: An Inexpensive Alternative to Commercial Infrared Sensors. Department of Psychology & Neuroscience Program, Albion College. Albion