



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 4, April 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com



Design and Fabrication of Multi Agriculture Machine by Using Remote Control and Batteries

Ms. P.K MEGHA RAMESH, B.R SHIVA DARSHAN^{*1}, A.MAHESH^{*2}, S.VIJAY KUMAR^{*3},
D.PAVAN KUMAR^{*4}

Assistant Professor, Department of Mechanical Engineering, Sanskrithi School of Engineering, Puttaparthi, India

Department of Mechanical Engineering, Sanskrithi School of Engineering, Puttaparthi, India

ABSTRACT:-The objective of this paper is to develop "Multi Agriculture Vehicle. India has always been known for its agricultural products and quality, plus it is one of the key drivers of Indian economy. But since most of the farmers are poor and have smaller farms, there is a need to develop a portable agricultural vehicle which is affordable even for the poor farmers. Also the present agricultural vehicles which are developed have only single functionality i.e. either only cutting, sowing or water/fertilizer spraying or only ploughing mechanism. The main components of the vehicle are wheels, batteries, DC motor, centrifugal pump, rain sensor, control panel. The function of this agricultural vehicle depends on the amount of batteries energy that the electric charging receives and this battery energy is used to drive the different parts of the vehicle. The mn-hn battery (lithim) is use to charge a rechargeable battery of 12 volts. From the battery the stored electrical energy is sent to DC motor which is used to drive it. The motor converts electrical energy to mechanical energy and this energy is used to perform different operations like water spraying, ploughing, seed sowing, climate dector, cutting with the help of switch control mechanism. The power transmission is done by using various switch control mechanism. This vehicle reduces the human effort in the field of agriculture and finds a solution to increase the mechanization in the fields. This vehicle is mainly useful for small size farms in order to increase the productivity. This vehicle runs on battery energy which is renewable and is easily available. As mentioned above it can perform multiple functions like seed sowing, water spraying, ploughing, cutting in a cost effective way. This vehicle makes use of different mechanisms like chain mechanism and worm and mechanisms in order to carry out these operations.

KEYWORDS: Cutter, Ploughing, Water/fertilizer, Electic battiers, Climate dector, Remote control.

I. INTRODUCTION

India is an agriculture based country where 70% of people depend on agricultural produce. The written history of agriculture in India dates back to the Rig-Veda. India is second in the world in terms of agricultural production. However, agriculture is the largest economic sector demographically and plays an important role in the overall socio-economic structure of India. If we compare the production or efficiency of Indian farms with other countries in recent years, we realize that India is definitely lagging behind. The main reasons behind India's lag in agricultural development are: lack of proper mechanization in farms, smaller farms, economically poor. Background of many farmers, Excessive work in doing different processes separately, Extra time to carry out individual processes separately, Messy countryside in India.

Due to the above problems, many farmers cannot afford heavy agricultural machinery (vehicles) due to smaller land size and financial constraints. Also, traditional equipment and methods often require a lot of human effort and multiple operations. Thus, agricultural mechanization is a necessary concept to improve efficiency and reduce production costs. The multi-functional agricultural vehicle solves the problems faced by farmers, such as cutting, spraying fertilizers, climate dector, and ploughing. We see this project as a cost-effective and efficient way to revolutionize small farms in India, the industry's most underserved region. These vehicles are capable of operating 24 hours a day, year-round, in most weather conditions. In addition, such a system can have a lower environmental impact if it can reduce the overuse of chemicals and high energy use, such as fertilizers, whose management is better adapted to stochastic requirements. Adding electric charger to charge the battery and power the vehicle also has the added benefit of reducing pollution



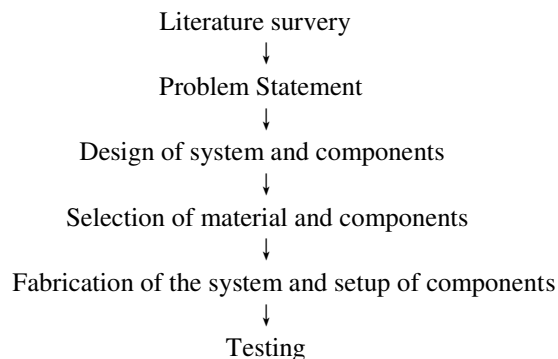
from environment. The main components of the vehicle are battery, DC motor, centrifugal pump, climate detector, remote control, panel board wheels. The operation of this agricultural vehicle depends on the battery energy received from the electric current and this battery energy is used to control the various parts of the vehicle. A lithium-based battery is used to charge the rechargeable 12-volt battery. The electrical energy stored in the battery is fed into the DC motor which is used to move it. The motor converts electrical energy into mechanical energy and this energy is used for various functions like spraying water, ploughing, cutting with the help of switch control mechanism. Transmission is done by various switch control mechanisms and chain. Our model is designed in such a way that it can also be used in small farms and it can efficiently perform various operations such as cutting and plowing, watering and sowing seeds. “DESIGN AND FABRICATION OF MULTI AGRICULTURAL MACHINE BY USING REMOTE CONTROL AND BATTERIES”

II. RELATED WORK

PROBLEM DEFINITION :-

- Lack of mechanization in farming
- Required excess efforts for different process.
- Required more man power.
- Excess time consumption for performing individual process

III. METHODOLOGY



IV. DESIGN OF SYSTEM AND COMPONENTS

WORKING PRINCIPLE:-

The working of the system is fully mechanically. The system is run on 12V dc battery. The battery is charged by 12v. 600amp motor is used to move the vehicle. The batteries transmitting the power to panel board to do the operation of different type of ploughing, cutting, water/fertilize. The vehicle as been operated by remote control of moving opposite directions. All this structure is supported by a solid MS frame.

India is a country where farming is main occupation and culture then also in India most of farmers attempt suicide reason behind this is machine, as in India 10-20% of farmers are rich but rest of farmers don't have much source to purchase heavy equipment and machines. So we have decided to design a machine which can fulfill basis need of farming and price of machine should be very less as compared for market. Main objective of machine is drilling, fertilizer spraying, seed sowing & cultivating. For solving this purpose we have designed this type of machine.

For spraying operation motor, battery and switch is given. When switch is on, fertilizer pump from the motor and enter to the sprayer nozzle then it spray with high velocity to the crops.



2D MODEL

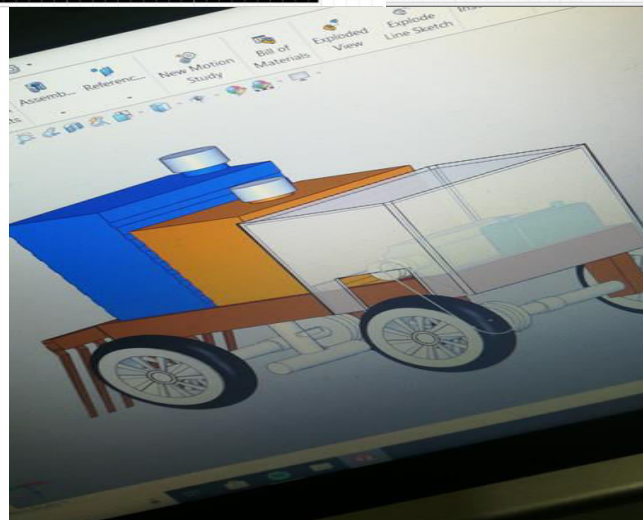
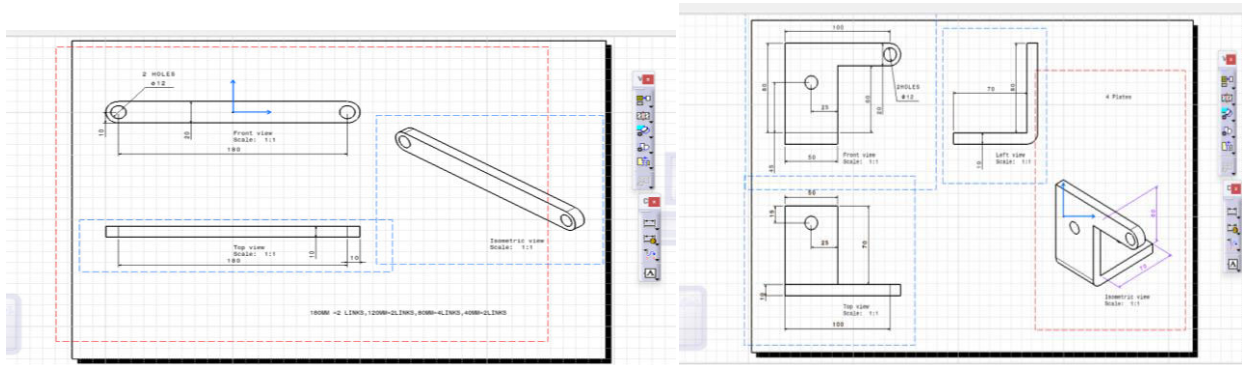
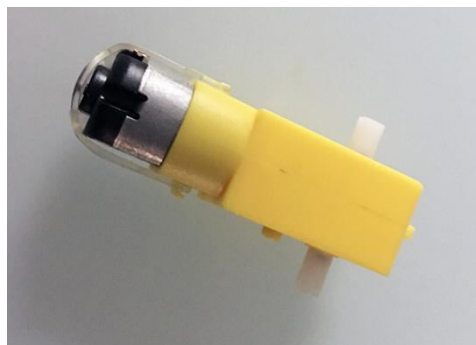


Fig.(1) Auto cad 2D Model.

COMPONENTS:-

GEAR MOTOR :-

The main purpose of the gear motor is to produce high torque while using a low horsepower or low speed , motor output .Most synchronous AC electric motors have output range from 1200 to 3600 RPM .The operating voltage is +12v.



Fig(3) Gear motor .

REMOTE CONTROLLER:-

A remote control (RC) is a small, usually hand-held, electronic device for controlling another device, such as a television, radio or audio/video recording device. Remote controls commonly operates via infrared signals but

sometimes by radio frequency signals. The remote control may control a variety of functions such as volume, channel, track number and other functions. Modern remote control devices often have more controlling functions than are found on the device itself, which may have only a few primary essential controls.

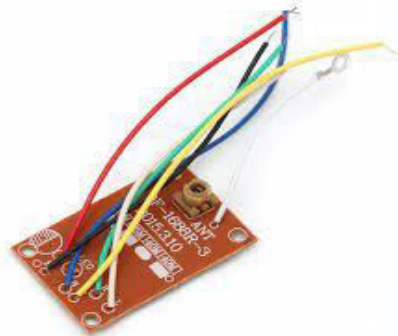


Fig (4) Remote control Board.

SUN BOARD:-

A strong and lightweight material that is easily cut with a sharp craft knife or picture framing mat cutter. They are waterproof and scratch-resistant. A layer of lamination film pasted on the image also prevents the inks from fading in the sunlight. A laminated sunboard print is easy to maintain and keep tidy. Foam board can be used to insulate any exposed cavity in your home from the top to the bottom, and even the walls if you are remodeling and the drywall is down. It can also be installed in the open cavities of your pole barn.



Fig(5) Sun Board.

Conduction is the movement of heat through a medium, which means that reduced heat conduction created by foam board insulation can work to keep your home more comfortable if it is installed correctly. The most common types of material used to make foam board insulation include polystyrene, polyisocyanurate and polyurethane.

WATER SUPPLY UNIT PUMP:

A centrifugal pump converts input power to kinetic energy by accelerating liquid in a revolving device – an impeller. The most common is the volute pump – where fluid enters the pump through the eye of the impeller which rotates at high speed. The fluid accelerates radially outward from the pump chasing and a vacuum is created at the impellers eye that continuously draws more fluid into the pump. The water in the supplying unit is impelled out of the tub to the required point of the crops through the rubber tubes provided at the end of the nozzles provided at the outlet of the centrifugal pump. Three centrifugal pumps are provided at either sides of the supply unit to supply water on the either sides of the vehicle when it is moved across the farms. The amount of water supplied is controlled by control switches which are made connected to the centrifugal pumps and the battery unit. The water supply unit used here is nearly 5 litres capacity which runs on the centrifugal pumps running at 12V and a speed of 600rpm.



Figure 6: Water supply pump

PANEL BOARD :

The remote control circuit board is the heart of the controlling vehicle. It handles the translations of different signals and electrical charges between the different parts of the car to control and operate ploughing, water supply, cutter. It transmits the signals to car .



Figure 7: Panel board

PLOUGHING :

Plough is another word for plow, which is a farm tool with heavy blades that cuts through the soil. A farm tool with heavy blades is an example of a plough.

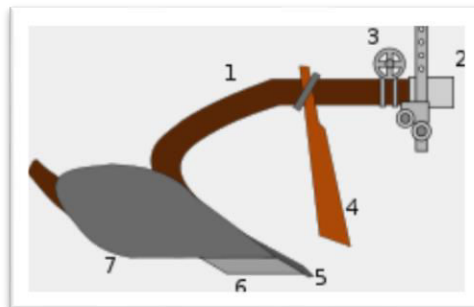


Figure 8: Ploughing

CUTTING :

Cutter Blade. A rotary blade cutter is used for quick cuts, a tangential knife for details and a creasing tool for setting fold lines. To cutting the grass from the farming.

• **FABRICATION OF THE SYSTEM CONSIST OF MANUFACTURING SETUP OF COMPONENTS:-**

The main body parts are used the sun board because floating is main purpose so the sun board is light weight and strong .In this we have mainly two types of operations .Cutting and Sticking operations.

WIRING:

The wiring of motor to transmit electric current from the to electrical energy to mechanical energy.By the transmitting of power from the wire to be solering.



Figure 9: Wiring

CALCULATION:-

batteries - 6v 100mah 600amps

There are 12 cells in a single 2.5 to 6 volts

Each cell produce approximately 0.5 to 0.6v

$V = \text{voltage in each cell} * \text{no. of cells in solar panel}$

$V = 1.5 * 12 = 6V$

We need minimum of 12v to run the motors, Because of the operating voltage of the gear motor is 12V.

MODELLING:-

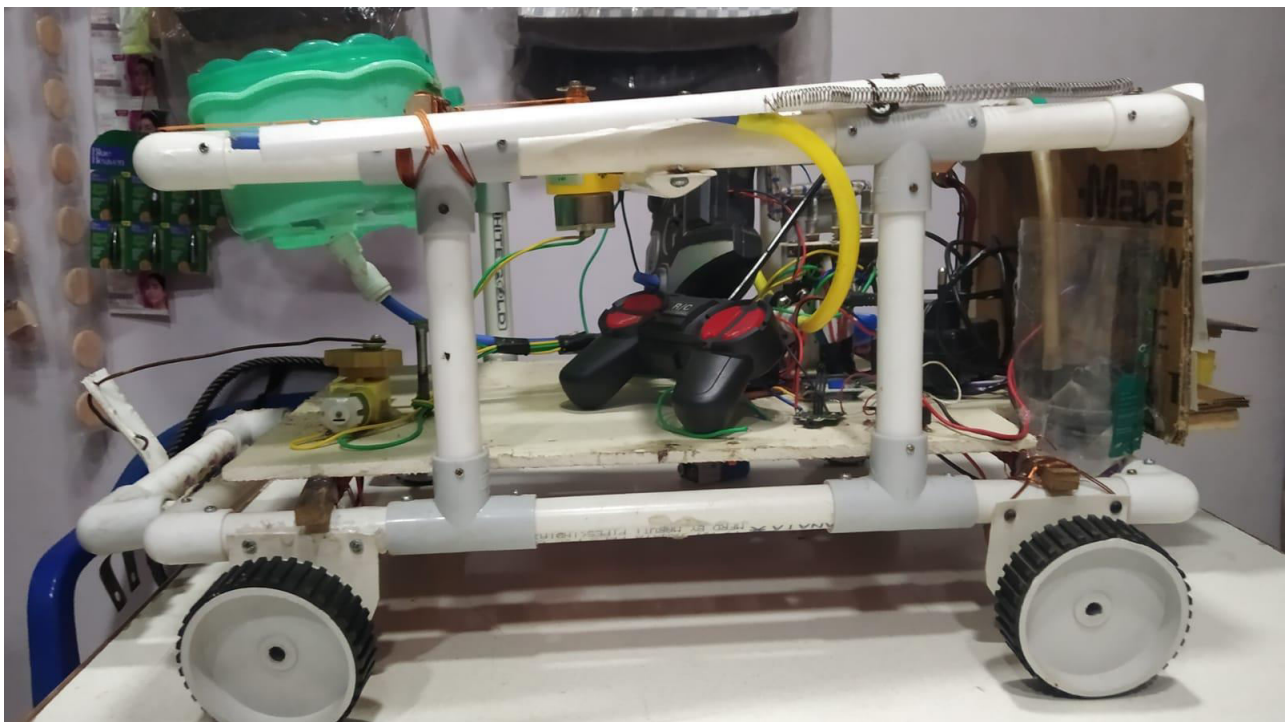


Fig (9) Complete model .



|| **Volume 12, Issue 4, April 2023** ||

| **DOI:10.15680/IJIRSET.2023.1204284** |

V. EXPERIMENTAL RESULTS

Our automatic multi agriculture machine system has successfully replaced manual control of vehicle. So our project is economical and efficient by the use of batterie energy. This system was designed and fabricated successfully it works satisfactorily

VI. FUTURE SCOPE

- We can interface sensors to this Machine so that it can monitor some parameters.
- We can add Wireless Technology to Control Machine.
- We can add More cutter for different crops.
- We can add water tank + fertilizer tank in Machine to reduce more efforts.
- There are to be proper provisions are needed to couple the machine with the tractor.
- We can add solar panel for system to use electric vehicle

VII. CONCLUSION

After the manufacturing and trail on the “Multi Agricultural Machine by using (Farm Machine)” conclusion made are as follows:

Based on the overall performance of the machine we can definitely say that the project will satisfy the need of small scale farmer, because they are not able to purchase costly agricultural equipment.

The machine required less man power and less time compared to traditional methods, so if we manufacture it on a large scale its cost gets significantly reduce and we hope this will satisfy the partial thrust of Indian agriculture.

So in this way we can overcome the labour problem that is the need of today’s farming in India

REFERENCES

1. R. Eaton, R. Eaton, J. Katupitiya, S.D. Pathirana (2008), Autonomous farming: Modeling and control of agricultural machinery in a unified framework, 15th international conference on mechatronics and machine vision in practice, New Zealand.
2. Shrinivas R. Zanwar, R. D. Kokate (June-2012), Advanced Agriculture System-International Journal of Robotics and Automation (IJRA) magazine.
3. Blackmore, S. (2007). A systems view of agricultural robotics. Precision Agriculture conference, Wageningen Academic Publishers, the Netherlands. pp. 23-31
4. Butler, S. (1887). Luck, or cunning, as the main means of Organic Modification? An attempt to throw additional light upon Darwin’s theory of natural selection. (London: Trübner & Co.) Reprinted as vol 8 of The Shrewsbury Edition of the works of Samuel Butler (London: Jonathan Cape, 1924)
5. Dyson, G. (1997). Darwin among the machines, The Penguin Press
6. Leropoulos, I., Greenman, J., and Melhuish, C. (2003). Imitating metabolism: Energy autonomy in biologically inspired robots. AISB '03 Second international symposium on imitation in animals and artifacts. Aberystwyth, Wales, pp.191-194.
7. Shibusawa, S. 1996. PhytoTechnology - An introduction to the concept and topic of a new Project. <http://phytech.ishikawa-c.ac.jp/WhatIs.html>
8. TILLET, N.D., HAGUE, T. AND MARCHANT, J.A.(1998) A ROBOTIC SYSTEM FOR PLANT SCALE HUSBANDRY. JOURNAL OF AGRICULTURAL ENGINEERING RESEARCH, 69, 169



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.423



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

9940 572 462 6381 907 438 ijirset@gmail.com



www.ijirset.com

Scan to save the contact details