

# Designing and Building a Seed Sowing Machine for People with Physical Disabilities

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## Abstract:

This agricultural vehicle designed for individuals with physical challenges boasts considerable power and significant soil-clearing capabilities. Offering a multipurpose functionality, it provides an advanced approach to sowing, plowing, soil leveling, and crop and grass cutting, all with minimal manpower required. The machine operates efficiently while cultivating the farm, considering specific rows and columns at fixed distances based on the crop requirements. Additionally, the vehicle can be manually controlled through a seating arrangement for driving. Powered by a motor, the agricultural vehicle utilizes solar energy to charge its batteries. The ultimate objective is to create an agricultural vehicle that relies on renewable energy sources to benefit individuals with physical disabilities.

**Index Terms:** Agricultural vehicle, multipurpose system, physically challenged.

## INTRODUCTION

Cropping is important and tedious activity for any farmer, and for large scale this activity is so lengthy also it needs more workers. Thus agriculture machines were developed to simplify the human efforts. In manual method of seed planting, we get results such as low seed placement, less spacing efficiencies and serious back ache for the farmer. This also limited the size of field that can be planted. Hence for achieving best performance from a seed planter, the above limits should be optimized. Thus we need to make proper design of the agriculture machine and also selection of the components is also required on the machine to suit the needs of crops.

suitable to all farms, all types of corps, robust construction, also is should be reliable, this is basic requirement of sowing machine. Thus we made sowing machine which is operated by Physically Challenged and reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. For this machine we can plant different types and different sizes of seeds also we can vary the space between two seeds while planting.



**Fig.1-** Physically handicapped Seed Sowing Machine

## OBJECTIVES AND MEDHODOLOGY:

### 2.1Objective

The main objective of this project is to design and develop a machine/attachment to sow the seeds in soil automatically by running a machine over the field which will contain all the seeds that are to be sown in a bucket that will be mounted over the machine. This type of automation in a machine will help the farmers to

- 1) Drafting of seed sowing machine for physically challenged person using solid edge software.
- 2) Design and development of seed sowing machine is to put the seed and fertilizer in rows at desired depth and seed spacing, cover the seeds with soil.
- 3) To enable the machine for the sowing of several of seed like maize, wheat etc.
- 4) Comparative analysis.

### 2.2Methodology:

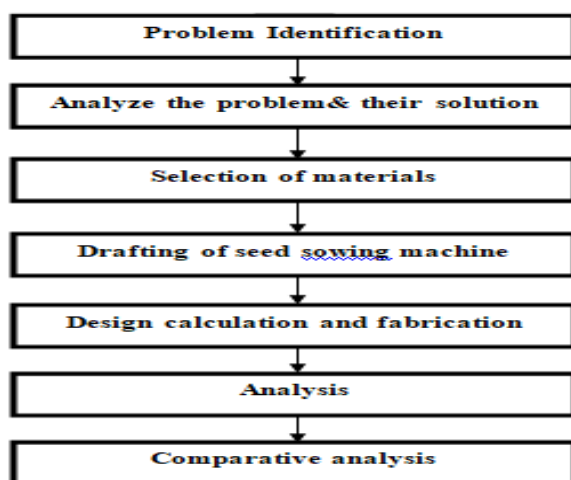


Fig. 2- Methodology flow chart.

The basic aim of this project is to develop a multipurpose seed sowing machine, which is used for digging the soil, seed sowing, and leveler to close the mud with minimum cost. This whole system of the vehicle works with the battery for physically handicapped persons..

- The base frame is made for the vehicle with 4 wheels connected and driven the rear wheel is dc motor.
- One end of the frame, cultivator is fitted which is also driven by dc motor and design is made to dig the soil.
- On the end front harvester blade is mounted.
- Solar is placed on top of the robot and is connected to the battery for charging the battery.
- Thus the max efficiency is utilized from the sun by the solar panel and to the battery

## DESIGN OF SEED SOWING MACHINE:

### 3.1 ISOMETRIC VIEW:

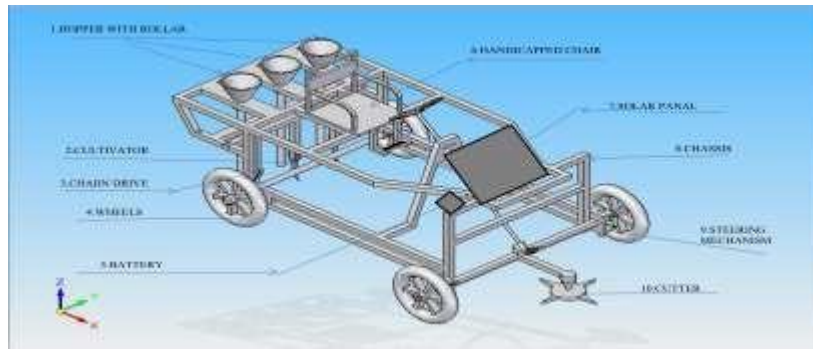


Fig.3-3D model

**3.2. PROJECTED VIEWS:**

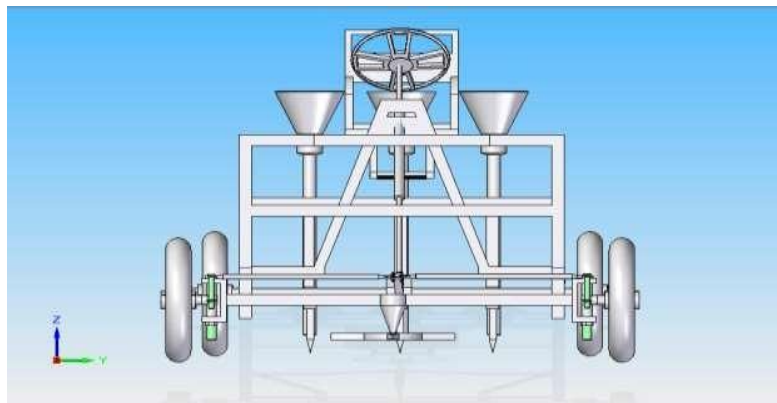


Fig.4- Front view

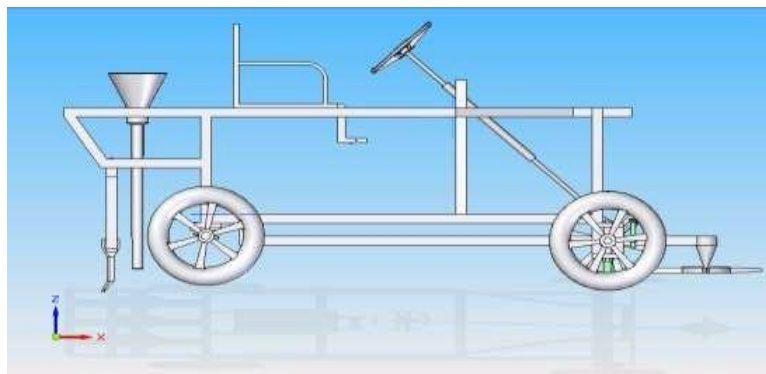


Fig.5- Side view

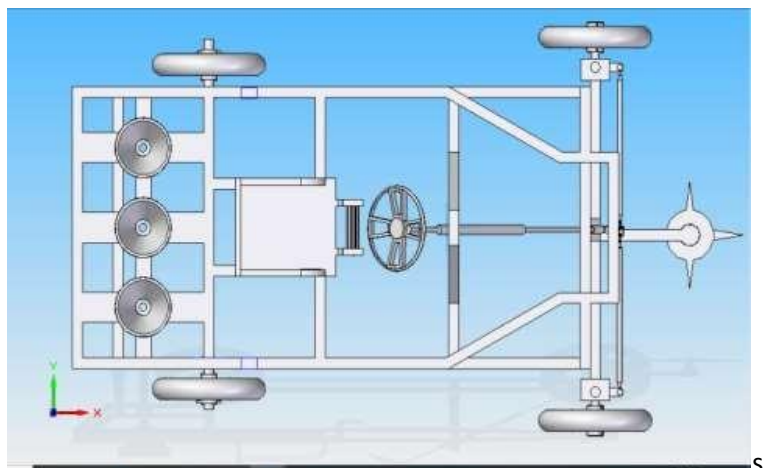


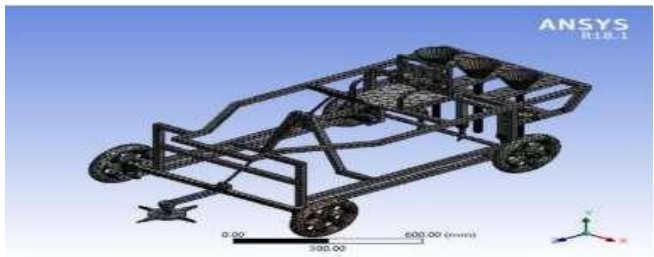
Fig. 6- top view

**Results and Discussion:**

**4. ANALYSIS OF SEED SOWING MACHINE:**

**4.1 Pre-Processing Parameters:**

- **Material:**
  - Body: Mild Steel
  - Wheels: Polyethylene
  - Belt: Polyethylene



➤ **Mesh:**

- **No. of Elements:** 48,323
- **No. of Nodes:** 1,22,446
- **Element Size:** 20mm (Max)
- **Transition Ratio:** 0.272
- **Min Edge Length:** 0.22mm
- **Element Shape:** Tetrahedral
- **Loads:**

**Fig.7-** Meshing



**Fig.8-** constraints



**Fig.9-** application loads

## 5. Results & Discussions:

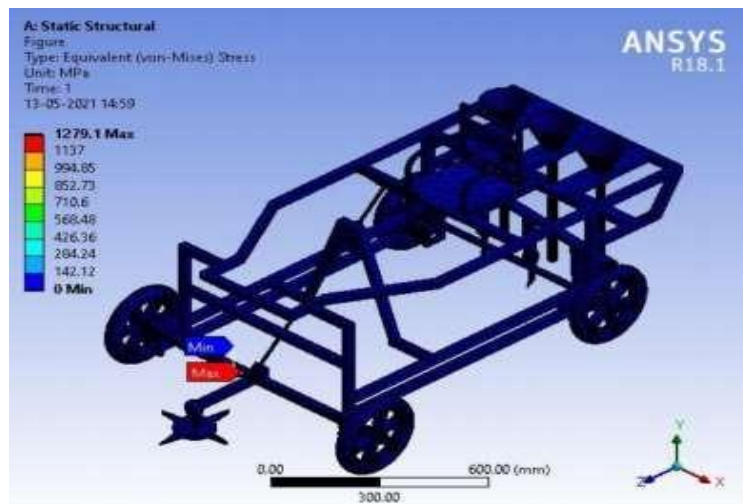


Fig.10- Distribution of Stresses

### Stress Values:

- ✓ **Max Stress:** 1217.9 MPa
- ✓ **Min Stress:** 1.421 e-14Mpa
- ✓ **Stress Type:** Von Mises Stress

### CONCLUSION:

Unique machine designed to carry out the task of spraying the fertilizers and sowing of seeds is developed by authors. The complete calculations along with the software model are presented in this paper. The study of performance parameters of the machine is scope of future work to be completed by the authors. It overcomes the problem associated with conventional spray such as back pain due to weight carried on back on person. The care is taken during the design to provide proper distance between two seeds in sowing operation. This machine is suitable for the farmers working on small scale. This is a handy machine which will be helpful to improve the performance during farming operations. It also covers the seed with soil in order to avoid loss of seeds eaten by bird

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