# DESIGN AND FABRICATION OF MULTIPURPOSE AGRICULTURAL EQUIPMENT

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**Abstract -** Agriculture being one of the major occupations in India, it is very essential to discover and implement new idea in this field, though lot of work has been done in this area. It is unfortunate that, these ideas are not been implemented properly in actual field. This is due to high cost and is complicated for rural people. Multipurpose agriculture equipment is basic and major equipment involved in agriculture for maximum yielding. Conventional method of planting and cultivating the crops is a laborious process and hence for that reason there is a scarcity of labours, this result in delayed agriculture to overcome these difficulties,

Multipurpose agriculture equipment is designed. Agriculture plays a vital role in the Indian economy. Over 70 % of the rural households depend on agriculture. Agriculture is an important sector of Indian economy as it contributes about 8.4% to the total GDP and provides employment to over 60% of the population. Indian agriculture has registered impressive growth over last few decades.

***Key Words***: (Size 10 & Bold) Key word1, Key word2, Key word3, etc (Minimum 5 to 8 key words)…

## 1. INTRODUCTION

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### 1.1 Multi-Purpose Seed Shower Along With Plougher

Technology is the process of applying the technology innovation occurring in daily life and applying that to the agriculture sector which improves the efficiency of the crop produced and also to develop a better mechanical machine to help the agriculture field which reduces the amount and time of work spent on one crop. Hence in this work of project it is decided to design a better mechanical machine which is available to the farmers at a cheaper rate and also which can sow and seed the crop at the same time. This project consists of the better design of the machine which can be used specifically for rice, wheat crops etc.

Developed agriculture needs to find new ways to improve efficiency. One approach is to utilize available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision farming has shown benefits of this approach but now moving towards a new generation of equipment. The advent of autonomous system architectures gives us the opportunity to develop a complete new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right way. The main aim of the project is as follows

The first step is to go to the farmers and find the problems faced by them. The second step is to choose a problem.

The third step is to Design & Analyze the problem.

The last step is to find a solution and develop a prototype.

### 1.2 Fabrication Concepts

Fabrication is a process of making components by cutting, bending and assembling. Fabrication is the extended phase in our project. After completing design of the machine the process of doing fabrication and assembling the components. The method of Manufacture of the component is done mainly by casting. This also includes many steps. Fabrication includes steps as follows.

- Inspection and Quality control
- Casting
- Welding
- Heating
- Cleaning

Some of the secondary operation like

- Chamfering
- Honing
- Grinding

### 1.3 Preferable Materials for the Parts

**Shaft:** The shaft main rod can be made of Alloy steel/cast iron and our model is of a length of 550mm.The shaft carries all the main of the mechanical plough seed like the wheels, pull rod, basins and the plough rods. The design of this shaft is done in a way that it should have the strength and the stress is developed at all the joins equally.

**Wheels:** The wheels can be made up of carbon alloys that they should be of minimum weight that they move with ease in the mud of the farm. Here to they are designed that it had spokes that the stress distribution is equal.

**Basins:** These are designed in a way that they are cylindrical in structure or joining of two conic sections that the seeds are moved to the centre to seed them with ease and they don't get stuck at any places as they are forced to move to the centre and at the join, it is given small join hole of millimeter in diameter that only one seed can pass through that which can be done by micromachining process while fabricating the basin and it is made with sheets of mild steel that they are of less weight.

**Plough rods:** These are clamped to the bearing s of the shaft and are designed in as Clamps that they have been made of cast iron. These are at an angle and are placed somewhat back to the seeding position that after seeding this plough will be labeling the ground and then ploughs the field.

**Remote control:** It is a component of an electronic device used to operate the device wirelessly from a distance. For example, a remote control is used to operate devices such as a television set, DVD player, car toys, etc

Remote control has continuously evolved and advanced in the 2000's to include Bluetooth connectivity, motion sensor-enabled capabilities and voice control. The technology used in remote controls is infrared (IR) light.

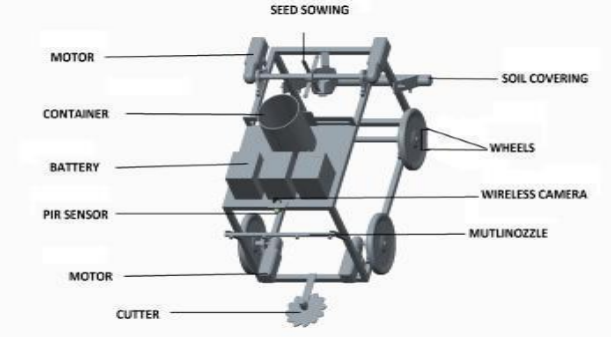
**PIR(passive infrared) Sensor:** It provides thermal indoor/outdoor motion of intruders within detection area. This is passive non contact area. This sensor is passive non contact type sensor and is designed to operate with battery power supply. PIR sensor is a equipment with wireless module for transmission of alarm signal.

**Wireless camera:** It is a electronic device used to capture the picture, moment.

**Facing:** First the casting of the Shaft, pull rod, bearings are done using the casting methods. These are casted using various material properties and various casting methods. Later after the casting is done the casted parts are cleaned and are kept a side. These parts are then welded to the main shaft one by one. There are also many welding processes to weld these parts. Generally the type of welding process we do use for types of parts connect them to a shaft by arc welding process as these nee d strong attachment between them.when it is operated. It uses infrared radiation (IR) rays. It used in agriculture field for monitoring any obstacles on the of machine, how the

**Sprayer:** It is a device used to spray a liquid in agriculture; a sprayer is a piece of equipment that is used to apply herbicides, pesticides and fertilizer.

## 2. EXPERIMENTAL SETUP AND PROCESS




Block diagram

| | |
|---|---|
| 1. Storage box | 2. Cutter |
| 3. PIR sensor | 4. Supporting bar |
| 5. Fertilizer sowing box | 6. Plough |
| 7. Main frame | 8. Ground wheel |
| 9. Fertilizer sowing pipe | 10. Main frame |
| 11. Soil covering | 12. Battery |

Parts of the equipment

### Operations Involved in Equipment

**Ploughing:** This is the mechanism used in all the agricultural fields to maintain the fertility of land, due to forward movement of the equipment the plougher is attached to the front of the equipment with predesigned number of teeth and teeth depth.

**Sowing:** As the equipment moves the ploughing process takes place, the chain sprocket is attached to the rolling wheel and this is directly connected to shaft which in turn connected to storage box, the shaft has teeth which revolve due to rotary motion produced in previous attachments. Hence seeds are sowed via pipes connected which are aligned to the ploughing teeth.

**Digging of soil:** By providing blades on the periphery of the rolling wheel digging is carried out and soil becomes softer for more cultivation.

**Fertilizer spraying:** spraying of fertilizer is accomplished by help of a storage tank in which pump is submerged to pump out the liquid by a multiple nozzle attached via a pipe to it.

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## 3. CONCLUSIONS

The present situation in our country all agricultural is working on manual operation otherwise by petrol engine or tractor which is expensive, farmer can't work for long time manually to avoid this problem, we need to have some kind of power source system to operate the digging machine.

Multipurpose equipment is designed and fabricated with low-cost, easy to use and effective equipment for agriculture.

Since seeds and fertilizers are placed in a sowing box over wastage of the same is eliminated, thus it will reduce the cost in planting.

We trying to implement a prototype model of drilling and seed sowing machine system within the limited available source and economic.

The system can be subjected to further development using advanced techniques.

It may become a success if our project can be implemented throughout our count

## ACKNOWLEDGEMENT

The authors can acknowledge any person/authorities in this section. This is not mandatory.

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