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# A Review Paper on Modelling and Fabrication of Multipurpose Agriculture Machine

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***ABSTRACT:*** *Agriculture in India is one of the major occupation, which becomes the backbone of the country, nearly 70% of the people are dependent on agriculture. It is well known about India's population and the way of inheriting the land from ancestor's which is why most of the farmers in India own only a average of two to three acre of land and they are also not economically stable to own tractors for farming once they use traditional method using animals like bullocks, horses and he-buffalo for farming operation that delays the time of cultivation which do not satisfies the need of the country, therefore the fabrication of multipurpose agriculture vehicle helps the Indian farmers to reduce the cost of cultivation and increase the economy of the Indian farming.*
***KEYWORDS****: agriculture machine, chassis frame ,engine110c , rotavator , plougher ,irrigation pump leveler ,hopper.*

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## I. INTRODUCTION

The major occupation of India is agriculture, When India got its freedom in 1947, it was not able to feed its population due to low production of food, Where it has to import most of the food materials form many other countries. The major reason for the low production was lack of technology that can be used by people, due to which most of the work in the field was done by man labour which actually took long time for production to happen, this makes one of the great impact for low production and productivity in the countrysince Indian's population is growing rapidly and there is increase in demand, hence there is a need for multipurpose agriculture vehicle which can do many jobs with single machine many attachments with comparatively low cost that can affordable many small scale farmers

## II. LITERATURE REVIEW

1.Sheikh Mohd Shahid MohdSadik, H.A. Hussain[2017], In this paper the author draws the attention towards the design of the wheel , where the wheel has depth adjuster for maintaining the uniform depth and gripper wheel is fitted to the tire for providing grip into soil during ploughing and seed sowing, we take these points while design and fabricating the wheel.

2.P.Vojay, K.V.n.Rakesh, B.Varun[2013], In this research paper the author has mainly given importance to the design og seed cum plougher considering crop-crop distance and distance between stack of soil, which has given us the clear idea for fabricating seedsower considering the factor crop-crop distance.

3.Aby Cherian, Jessen.S.punnan, Abi Varghese[2016], In this research paper the author draws attention towards the performance factor of the tiller when manyattachments are made, we take these factors intoconsideration whiledesigning the sustainable factor of agriculture vehicle.

4. Vishnu Prakash K, Sathish Kumar V, Venkatesh P, Chandran A[2016], in this research paper the author has concentrated towards the design of the equipment which works in the environment with many obstacles and tight spaces having enough capacity for optimal work performance, we take these points to design compatible equipment which can be used in environment with many obstacles.

## III. BASIC DESIGN CONCEPT

The concept of designing the equipment is for small scale farming. The one machine performing multifunction with cheap cost which is more efficient and economic compared to other agriculture machines, Also the machine does not essentially require skilled labor to operate, since the mechanism of operation is very simple, which is very suitable for small scale farming.

## IV. CONSTRUCTION DETAILS

1.Chassis frame
2.Engine 110 CC
3.Mudgards
4.Rotoveter
5.Leveler
6.plougher
7.Irrigation pump
8.Hopper

**1.CHASSIS FRAME:**

A chassis is developed ridgid and fabricated to provide required support and strength to the model. The frame is developed in such a way that it occupies less floor space and adds up less weight to the complete model.It is provided with adjustable handle to provide more compatibility during working. The chassis is considered as a important feature in the machine, since it holds both machine body and the power train i.e., the whole set up mounted on the frame alone.

**Figure1.1:** Chassis Frame

**2.ENGINE 110CC:**

Engine is mounted on the frontside of the chassis, the engine here is used for power transmission, to run the spray pump and harvester setup, the speed of the engine can controlled by accelerator that is provided at the handle of the frame.

Figure1.2: Active Engine

Table1.1: Engine Specifications

| PARTICULARS | SPECIFICATIONS |
|---|---|
| Engine CC | 109.2 cc |
| No Of Cylinder | 1 |
| Max Power | 8 BHP @ 7500 rpm |
| Max Torque | 8.83 Nm @ 5500 rpm |
| Valves Per Cylinder | 2 |
| Fuel Delivery | Carburetor |
| Starting Mechanism | Self / Kick Start |
| Cooling System | Air Cooled |

**3.MUDGUARDS:**
Mudguards are the shields provided to protect the wheels safety while carrying out the field operation by opposing the settling of the soil over the wheels and also entering of dirt and dust into the transmission system.

Figure 1.3: Mudguard

**4.ROTOVETER**
Rotoveter is generally used for loosening of the soil. It generally consists of blades mounted around the universal shaft,the rotational speeds of these blades are manually controlled by the accelerator.

Figure1.4: Rotary

**5.LEVELER**
Leveler is used to cover the sown seeds by pulling a layer of soil over it and to prepare the land for next crops, It is the flat metal plate which is affixed to the rear end of the equipment to layer up the soil.

Figure1.5. leveler

**6.PLOUGHER**

Plougher is used to make the land favorable for sowing of seeds, the metal plates are forged to obtain the required profile shape of the plough , the plough is mounted on the rear end of the machine to a slide through frame so that its position can be varied and fixed to farmers need.

Figure1.6: Ploughing

**7.IRRIGATION PUMP**

Irrigation pump is used for pesticide spraying and pumping water for cultivation hence reduction is the cost required for investment on irrigation pumping

Figure:1.7 Irrigation Pump

| PARTICULARS | SPECIFICATION |
|---|---|
| Pressure | 21-45 kg/cm$^2$ |
| Operation | 800-1200 r.p.m |
| Capacity | 14-22 L |
| Required power | 1.5-2 Kw |

Table1.2: irrigation pump

**8.HOPPER:**

A Hopper is fixed on -the side of the seeding drum,this seeding drum consists of the metallic plates for controlling of the seed flow .The complete assembly of the hopper and the seeding drum are fixed on the frame using fasteners.

Figure1.8:50ml filling hopper

## V. CONCLUSION

After considering many of the factors that "Multipurpose agriculture vehicle" can do, we can suggest that the project will satisfy the need of a small scale farmer, since it suits their economy, their man power ,their time compared with using traditional methods. The advantage of using single machine to perform different activities attracts and motivates many farmers to buy it ,therefore the equipment can be manufactured in large scale which might effectively reduce the cost. so in this manner the problems of small scale farmers in India can be solved.

## VI. FUTURE SCOPE

- To increase the flexibility in handling the machine like providing the seating arrangement to the driver.
- To provide depth adjuster to the wheels in order to maintain uniformity during seed sowing
- Replacing engine with the battery system so that the noise of the engine can be avoided
- To reduce the total weight of the equipment either by using light weight material for frame construction or by reducing the weight of the engine.

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