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Development of Multi – Utility Agricultural Vehicle

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Abstract: ***This topic deals with the development of multi-utility agriculture vehicle which provides an efficient, low cost alternate option to poor farmer. This multi utility agriculture vehicle work many function like: Spraying, plugging, seed sowing etc. it is very useful vehicle for poor farmers who cannot able to buy all different-different equipments. The sparing is traditionally done by labor carrying backpack type sprayer which requires more human effort. A plaguing is generally done by large farming tool with sharp blades; for small farm field seed sowing is done by hands it takes lot of time and more human effort. Seed sowing should be suitable to all types of corps, robust construction, also it should be reliable, and this is basic require of seed sewing machine. This also increased the sowing efficiency and accuracy.***
Keyword: Agriculture vehicle, multi utility, seed sowing, spraying, etc.

I. INTRODUCTION

The major occupation of the Indian rural people agriculture and both men and women are equally involved in the process. Agriculture has been the backbone of the Indian economy and it will continue to remain so for long time. It has to support almost 17% of world population from 2.3% of geographical area and 4.2% of world's water resources. Farming process is done by traditional the way, besides that there is large development of industrial mechanization area and service sector as compared to that of harvesting field. The spraying is traditionally done by labor type carrying pump type sprayer which requires more human effort and it takes lot of time. farmer are doing the sloughing with the help of bulls and tractors which is costly for poor farmer and small farmer land .sowing operation is to put seed and fertilizer in rows at desired depth and spacing, cover the seed with soil and proper compaction over the seed . The recommended row and climatic condition to achieve optimum yields and efficient sewing machine should attempt to fulfill these requirements. In addition, saving in cast of operation time, labor and energy are other Advantages are derived from use of improved machinery for such operation.

II. OBJECTIVE AND SCOPE

A. *Objective*

1) Reduce Time
2) Reduce Work Done
3) Seed Sowing With Proper Distance And Depth
4) Decrease the operation cost by using new mechanism
5) Making such a machine which can be able to perform for the operation (spraying, pouching, seed sowing).

B. *Scope*

Multifunction agricultural vehicle mainly focuses on the basic problems faced by fellow farmer's .i.e. seed sowing, fertilizer spraying, cultivation and weeding. We are look-in this project as revolution in small farms in India, which is most uncovered area in this sector, is cost and more efficient way.

III. METHODOLOGY AND WORK

A. *Methodology*

Farming process is downer by traditional the way, besides that there is large development of industrial mechanization area and service sector as compared to that of harvesting field. The spraying is traditionally done by labor type carrying pump type sprayer which requires more human effort and it takes lot of time. Farmers are doing the plugging with the help of bolls and tractors which is costly for farmers and who small farming land .the seed sowing is done by hand. So to overcome these above problems, we tried to eliminate these problems and designed the equipment which will be beneficial to the farmer for spraying, plugging and seed sowing operations

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B. Methodology of Work

1) The first step is to go the farmers and find the problems faced by them.
2) The second step is to choose a problem.
3) The third step is to visit to agriculture firms.
4) The fourth step is analyzer the problem& their solution.
5) The fifth step is the selection of materials.
6) The sixth step is to find which mechanism is too suitable in lowest cost.
7) The seventh step is to find all components we require in proper dimension.
8) The eight step to start fabrication.
9) The last step is the testing of machine.

IV. BILL OF MATERIALS

A. Materials Selection

S.No.	Components	Material	Specification
1.	Tank	Mild steel	Light weight, durable
2.	Nozzle	Plastic	For pressure up to 5 bar
3.	Rod	Steel	High strength
4.	Pipe	Plastic	Flexible, light weight
5.	Frame	Mild steel	Cheap, durable, good strength
6.	Connecting link	Mild steel	High shear strength
7.	Disc	Mild steel	Good strength
8.	Free wheel	Steel	Adopted from hero cycles, transmitting force up to 50N
9.	Shaft	Ms bright bar	Shaft is taken with the inner specification of free wheel
10.	Wheel	Steel	Durable, good strength
11.	Tayer	Rubber	Friction improved
12.	Sprocket	Steel	Adopted from hero cycles, transmitting force up to 50N
13.	Fasteners	Mild steel	High load bearing
14.	Pipe bends, elbows	Galvanized iron	Rust resistance
15.	Plough blades	Mild steel	Durable, high shear strength, good strength
16.	Seed storage tank	Steel	Good strength
17.	Seed disc mechanism	Stainless steel	Non-corrosive
18.	Bearing	steel	Support the vehicle

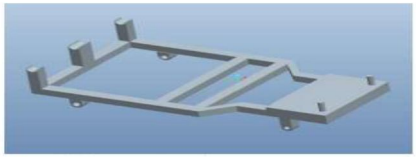
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B. Cost of Materials

Sr.no	Items	Cost
1.	Iron, Steel, Sheet Metal	4,500
2.	Tyre, Rim, hub	4200
3.	Foot bearing	550
4.	Machining	2000
5.	Pipe	150
6.	Tools purchased(nuts, bolts)	100
7.	Plough blades	650
8.	Tank	100
9.	Seed bucket	100
	Total cost	12,350

C. Design

1) Frame Design: The design is made which is suitable supporting all operation. The frame is making for a compact size vehicle.



Frame design

2) Design of the Proposed Tool: The life of the tool is increased by replacing the only the tip of tool the sharpness of tool is remains constant for significantly longer period time.





Figure, ploughed

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3) *Spraying Mechanism:* In spraying mechanism tank is attached to the vehicle which will full of pesticide and when the spraying is required the open the tap and we can also control the flow of pesticide by it.



Figure. Spraying

4) *Seed Mechanism:* Seed metering device meters the quantity of the seed which is going into the farm. It also maintains the required level of the sand in the tank. Mostly metering is necessary to track is again filled. It gives the length of the distance which can be sowed. Thus only requiring seed falls for every rotation of the wheel.



Figure. Seed sowing

5) *Assembled View of Vehicle:* The separately fabricated components are assembled in the vehicle frame. The harvester is attached to the front. The plough tool is attached with the clamp at the backside of the frame .the seed sewing machine is attached is respective place.



Figure. Assembled view of Multipurpose Agriculture Vehicle

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V. MERITS AND DEMERITS

A. Merits

1) Cost of machine is very low.
2) Human effort in all function is saved.
3) It is more suitable for small farmers.
4) Time saving.
5) It is pollution free.
6) Requirement of laborer is less.

B. Demerit

1) Operating force varies from person to person.
2) It is designed to suit only for small farmers.

VI. CONCLUSION

The equipment is purposely design for the farmers having small farming land say 5-8 acre. It is suitable for spraying as well as plugging at minimum cost for the farmer so that he can afford it. The equipment will result more beneficial when it is subjects to moist soil for seeding purpose, due to moist soil the seed collector can easily penetrate and dig out the soil and hence will easily accomplished the seeding process The performance of the equipment will increase when it is operates on the smooth surface or less uneven surface and also it will be more effective when it is used on
The crop having nearly similar height and having the less space between two crops

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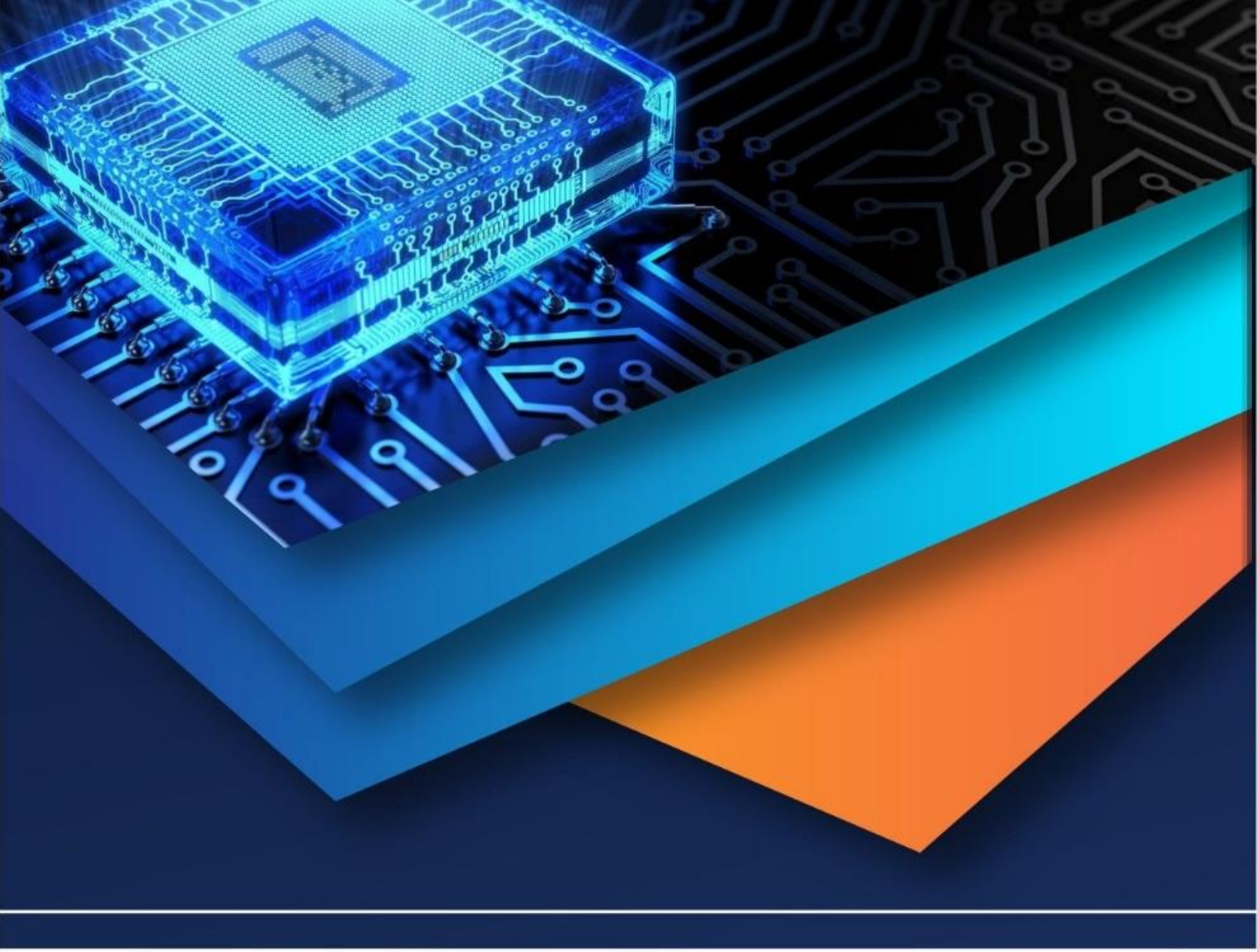
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