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## Multipurpose agriculture machine

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**Abstract-** All trades of village artisanship in black-smith carpentry, stone etc. contributed to the design of development of farm tools through artisan's ingenuity. Carpentry made the counterpoise to lift the water from wells to irrigate crops. Big size of earthenware was made by potters to store grains for month to be safe from insects and pest's cobblers used whole skins of animals to carry water to irrigate horticultural crops besides entering dust roads. Farming is the backbone of Indian economy. In this agriculture sector there is a lot of field work, such as weeding, reaping, sowing etc. Apart from these operations, spraying is also an important operation to be performed by the farmer to protect the cultivated crops from insects, pests, funguses and diseases for which various insecticides, pesticides, fungicides and nutrients are sprayed on crops for protection. As agriculture was the mainstay of the population, farmer required hand tools to do work, improve labor productivity and quality of work, therefore the results in poor productivity and obtain low yield MAE( Multipurpose Agriculture Equipment) was developed. We have 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. The advent of new concept gives 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.

**Keywords-** MAE( Multipurpose Agriculture Equipment)

### INTRODUCTION

Farming has undergone a great evolution in last 50 years. Out of the various reasons involved for this evolution is control of various diseases on crops. During initial days there was only hand spraying people use to do. Then slowly there has been development of various methods to spray out chemicals and dusts. Though these devices were highly efficient, there is a need to have certain changes. Chemicals are widely used for controlling disease, insects and weeds in the crops. They are able to save a crop from pest attack only when applied in time. They need to be applied on plants and soil in the form of spray, dust or mist. The chemicals are costly; therefore equipment for uniform and effective application is essential. Dusters and sprayers are generally used for applying chemical. The application of pesticide is one of the most frequently used methods to protect crops and trees against diseases and insects in agriculture. In the modern agriculture, the usage of pesticides is still increasing, moreover the 90% of these pesticides are being applied in the form of liquid spray and mostly by using the pressure gained from direct energy sources like electrical energy and chemical energy. Increasing public concern about the potential damage of chemical and electrical inputs in agricultural spraying systems has challenged industry to develop new and effective methods of spraying which will maintain environment friendly approach.

## DIFFERENT OPERATIONS

### Parali Cutter (Unuseful crop) :-

It is used for cutting the unuseful crops, which is laydown on field after cultivation of useful crops. It is a low cost cutting device in which cutting is done manually by the operator by using the solar energy in the battery provided for the purpose.



This is mounted on the front of agriculture machine and when machine moves in forward direction then it cut the unuseful crop with the help of cutter, which is rotate by motor and the motor takes power from battery.

So it is a low cost as well as free pollution device in agriculture field.

### Spraying : -

Hollow-cone nozzles generally are used to apply insecticides or fungicides to field crops when foliage penetration and complete coverage of the leaf surface is required. These nozzles operate in a pressure range from 40 to 100 psi.



When the unuseful crops are cutting by plant cutter after that we spray the pesticides in field to converted into organic manure.

### Ploughing :-

A large farming implement with one or more blades fixed in a frame, used to turn over and cut furrows in soil, is called plough. Plough may be made of only wood, wood and iron, and of iron only.



A plough or plow is a farm tool for loosening or turning the soil before sowing seed or planting. ... Many view plough as a derivative of the verb \*plehan ~ \*plegan 'to take ... Hoe-farming is the traditional tillage method in tropical or sub-tropical regions, which are ... It erases wheel tracks and ruts from harvesting equipment.

### Objective's of the Present study

The following are the objectives of this project work:

- It is the best and economic to farmers in today's world without any huge investments and it can be worked on external source like as electrical & solar energy and we can contribute today's world without air pollution and water pollution.
- Chemicals are widely used for controlling disease, in sects and weeds in the crops. They are able to save a crop from pest attack only when applied in time. They need to be applied on plants and soil in the form of spray, dust or mist. The chemicals are costly. Therefore, Equipment for uniform and effective application is essential. so to adopt new method of applying chemicals, by using chemical sprayer equipment.

### Agriculture machine equipment

#### Solar Plate -

A solar panel, or photo-voltaic (PV) module, is an assembly of photo-voltaic cells mounted in a framework for installation. **Solar panels** use sunlight as a source.



This is mounted on the top of the machine for absorbing the sun light after that it store in battery and provided the electrical energy to perform all the operation of machine.

### Wheel -

In its primitive form, a wheel is a circular block of a hard and durable material at whose center has been bored a hole through which is placed an axle bearing.



Motor - An electric motor is an electrical machine that converts electrical energy into mechanical ... In addition to AC versus DC type.

The principle of an electric motor is based on the current carrying conductor which produces magnetic field around it. A current carrying conductor is placed perpendicular to the magnetic field so that it experiences a force.

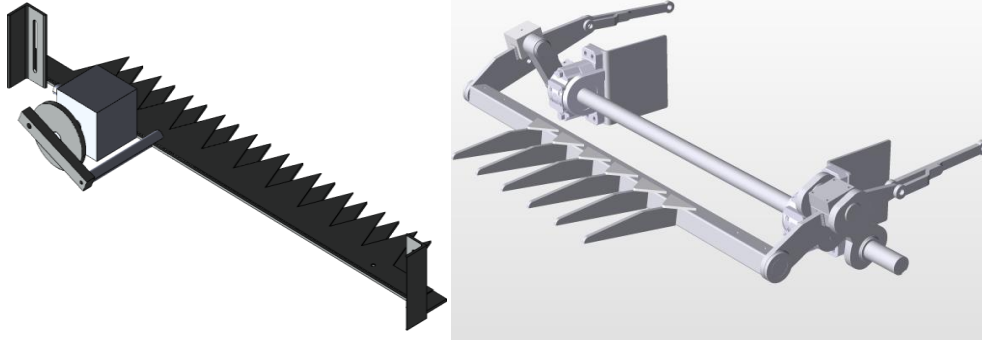


Plough mechanism - For ploughing, machine is provided with tentacles attached with saw blades.

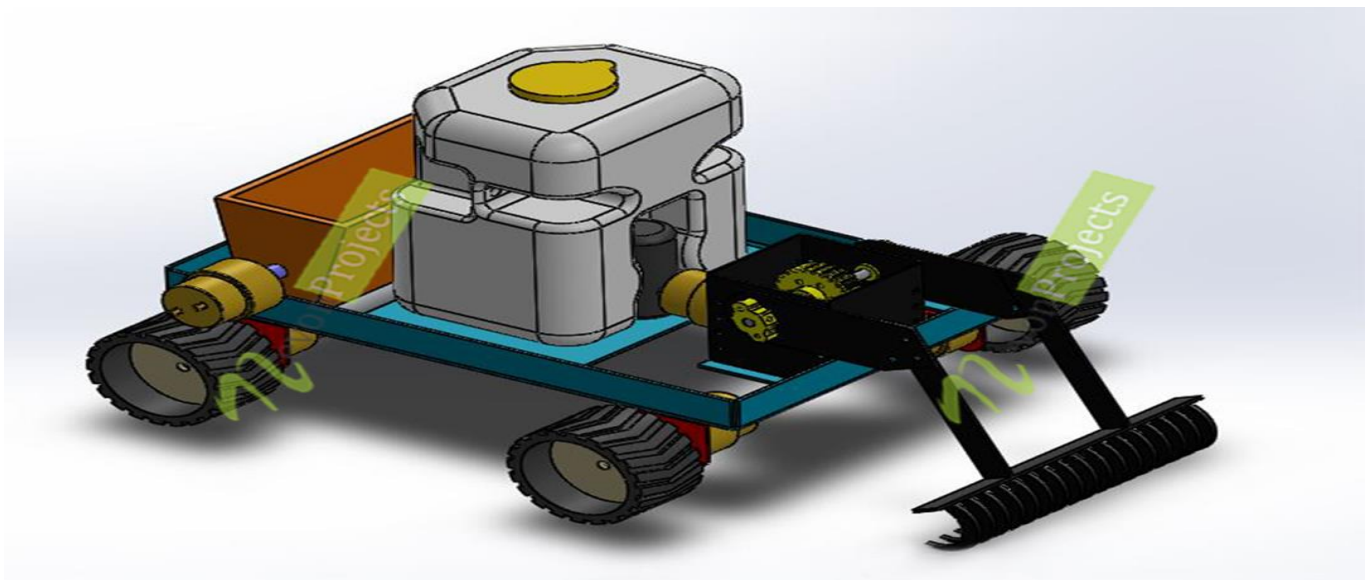




## Working and 3D Model of agriculture machine –



- In this machine, the solar plate is mounted on top of the machine for absorbing the sun light and it is store in battery in the form of electrical energy. So it give the power supply to different mechanism of machine for performing the operation.
- On the front of machine a plant cutter is mounted, when the machine moves in forward direction then plant cutter rotate and cut the unuseful crops.
- A sprayer is mounted on the top of the machine, with the help of nozzle the sprayer spray the pesticides and also water in the field accordingly to our need.
- Plough is mounted on the back of the machine.



## After Fabrication of agriculture machine –



### Advantages of agriculture machine –

- Leads to improvement in Agricultural Technique
- Mitigate Farm Labor Shortage
- It results in proper land usage
- It Reduces Fodder Area and Enlarges Food Area
- Best return of Farm Income

### Application of agriculture machine -

#### ➤ **Sprayers**

After planting, other agricultural machinery such as self-propelled sprayers can be used to apply fertilizer and pesticides. Agriculture sprayer application is a method to protect crops from weeds by using herbicides, fungicides, and insecticides. Spraying or planting a cover crop are ways to mix weed growth.

#### ➤ **Reaping**

Reaping is the process of cutting the plant, which is accomplished by the header, reel and cutter bar on the combine. The header gathers the crops while the reel pushes them toward the cutter bar, which cuts the crops at their base.

#### ➤ **PLOWS**

A plow is a large tractor attachment that drags behind the tractor, using long blades to cut furrows in the soil. This process not only loosens and turns the soil, but it also helps kill off any surface vegetation that is not intended to be there. While the soil has to go through several subsequent steps to be ready for planting, plowing is an essential first step.

## CONCLUSION

- a. The various components required for building the multipurpose agricultural equipment has been designed as planned.
- b. MAE is single system which can perform multi operations like , fertilizer Chemical sprayer, parali(unuseful) crops, ploughing.
- c. MAE will reduce external charges like fuels; electricity etc.and this will be helpful for poor farmers.
- d. MAE is a single system which contains multi attachments and can be easily assembled and dismantled comfortably. All the fasteners used in the equipment are of the same size.
- e. The equipment weight is around 8 to 10 kg (Excluding bicycle attachment) thus it can be carried easily in farmland.
- f. The equipment can do the work of 4 labors a day which reduces the labor cost of the farmer.

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