

Design and Implementation of Solar Fertilizer Sprayer (A project that helps farmers in fertilizing crops in an easy and better way)

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Abstract

India has around 100 and fifty million ranchers who straightforwardly own territory and use it for cultivating and 90% of farmers are utilizing conventional strategies to develop the fields. All conventional strategies require a lot of human endeavors and time. In this specific circumstance, when we visited the Gowdavalli town, We collaborated with a farmer named Balaswamy and attempted to comprehend the issues that the farmers are confronting. One issue that we feel we need to address by applying design information is the compost sprayer. A large portion of the ranchers is utilizing customary strategies for preparing the fields. They for the most part keep a hefty weight tank on their back and splash the manure by strolling starting with one end and then onto the next end. It requires a lot of time to splash the whole field. They are playing out this work regularly in a year and consequently, they are getting different medical issues like Respiratory issues, skin sickness, Back torment, and so on.

Keywords: Solar fertilizer Sprayer, Framing, Life-long learning.

I. INTRODUCTION

We, Students of Hyderabad Institute of Technology and Management, went for a survey in a nearby village to know the problems faced by villagers and farmers there. We got to know the Problem of a farmer, his name is balaswami. He is a farmer in gowdavalli village. While he is spraying fertilizers, he holds the fertilizer tank on his back with filled fertilizer spraying liquid and the whole weight of the tank is barred him. So to reduce this problem we come up with a solution. We designed a solar fertilizer tank. This sunlight-based manure tank is agreeable while showering composts in fields. On account of this tank we have masterminded the wheels for portability and furthermore deals with sun-oriented energy where it is a sustainable power. One more advantage is it contains three spouts to shower at a time. Time utilization will be less and covers a lot of territories. The all-out edge of the venture is worked with MS rods as a result of the lightweight metal. The tank contains a 30 liters limit. It moves on wheels by pushing. This tank contains a green leaf mt02-12hp heavy-duty diaphragm pump for double motor water pump also arranged three nozzles; they can spray three nozzles at a time and also a 40 Watts solar. The panel is arranged and it is renewable energy. Also arranged 20 Watts 12 amps battery in case of the raining season you can charge the battery with power. This project is developed under the theme of agriculture and rural development.

II. AIM & OBJECTIVES

Solar Fertilizer Sprayer provides better service is different from a similar product Farmers carry fertilizer tanks on his back with filled fertilizer spraying liquid and the whole weight of the tank is barred by him. So to reduce this problem we build a solar fertilizer tank.it moves on wheels main advantage is Solar powered sprayer, easy to use and it covers the whole area, so time consumption will be less. This type of fertilizing tank is not available in the market.in the market, there are only Solar tanks available but they don't have wheels. We are designing a Solar fertilizer tank that has wheels. It is one of the most advantages.in the market, tanks have one or two nozzles but this Solar fertilizer tank has three or four. You can fix it yourself. That is one advantage. This tank also has a double pump motor you can adjust the high or low speed. The main Aim and objectives focused for this project are:

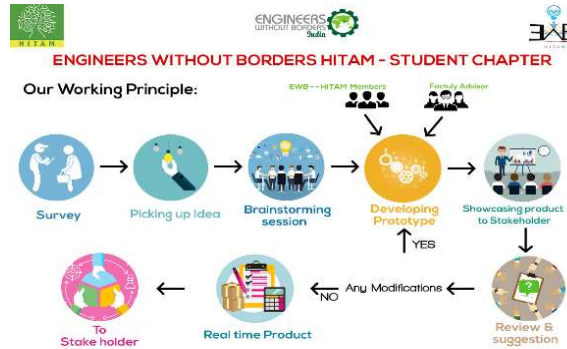
- **Making a product while will perform the task efficiently**
- **Provide a convenient solution to overcome medical issues which are generally farmers are getting from existing product**
- **Making product affordable so that maximum beneficiaries should use it**
- **This product will be varied with respect to fields of cultivation.**
- **This product can also be used for multi-purposes, like carrying solid fertilizer bags and essential needs,**
- **Easy movement of the device is portable and it covers a large area**
- **Reduces the physical stress of farmers**
- **During the rainy season the energy stored in the battery can be utilized**

III. LITERATURE SURVEY

Solar Fertilizer Sprayer is mainly designed to work in the agriculture field in order to reduce the work of the farmers. We have achieved the main progress of the project which is the spraying system which entirely works on solar energy. The main strength of the Solar Fertilizer Sprayer is it can be upgraded further in the future with the necessary devices like fertilizer spray, Temperature sensor, Soil fertility unit, etc., We planned to design a complete set that could be used in agriculture fields such as Spraying, carrying the materials through the model to the Fields. Therefore, it is possible to develop the multi-purpose Sprayer in the form of solid for a lower cost. Further studies are currently carried out to determine the usage of fertilizers in the field and along to detect the moisture of soil fertility This combination should be selected considering the norm of the requirement of a farmer. The main focus of us will be to minimize the problems of the farmers and as well as to decrease the manual work and to determine the capacity of usability of sprayers in the era of agriculture. The durability of the sprayer is very much economic and durable to the farmers.[1] In many economies around the world, countries focus on developing their agricultural field and activity. The agricultural sector is one of the most important sectors because it meets the world's requirements for providing food. The author in Paper [2] describes about power sprayers and Solar energy plays an important role in drying agricultural products and for irrigation purpose for pumping the well water in remote villages without electricity. This Technology of solar energy can be extended for spraying pesticides, Fungicides, Fertilizers, etc. paper [3] determines about the solar automatic sprayer system will operate on a renewable energy source, solar energy. The solar panel supplies the equipment meant to spray pesticides with electricity and reduces pesticide waste with a minimum of energy and time required by man. To understand Sprayers [4] describes Sprayers are commonly used on farms to spray pesticides, and herbicides and as a means of crop quality, maintenance, and control. There are many kinds of machine-operated sprayers, the most common of which used in India is a low-pressure hand-operated Sprayer. Author in paper [5] described the design The vehicle is powered using an onboard solar-powered battery which runs down the running cost. Besides reducing the cost of spraying, there is a saving on fuel as well. The farmers can do the spraying operation without human interference thus protecting them from noxious chemicals.

IV. WORKING PRINCIPAL

We followed the working principle of one of our Institute (Hyderabad Institute of Technology and Management) Chapter bod i.e IUCEE-EWB HITAM. This Chapter Working Principle is well designed by following all the norms of organizational goals to achieve Vision and Mission. It consists of 8 phases starting from Survey,



Picking up Ideas,

V. METHODOLOGY

Innovation is more technology-based than specified. It has solar energy is converted to electrical energy in this process we have arranged a converter for this project based on electrical this also have a wheel that is working on mechanical they're some of the features we have added this tank you can use carrying grains, vegetables, fruits, etc. This kind of treating tank is not yet accessible on the lookout. Out in the market, there are just Solar tanks accessible however they don't have wheels. We have planned and designed a Solar manure tank, which has wheels & perhaps is the most bit of leeway on the lookout, tanks usually have one or two spouts yet this Solar compost tank has three or four you can fix it yourself which is one of the preferred positions. This tank likewise has a twofold siphon engine which can change the high or low speed. The Existing solar fertilizer tank worked on physical energy. Farmers lift the whole weight of the tank on their shoulders and spray the entire field. They suffer from physical strain and health issues and take more time to spray. The proposed solar fertilizer tank works in wetland agricultural fields effectively. In this solar fertilize. tank. We have arranged wheels, 40 watts solar panel, green leaf mt02-12hp heavy-duty diaphragm pump for the double motor water pump, and also the total frame is built by ms road because of lightweight metal. This tank can spray large amounts of land in less time. Motor works on solar energy during rainy or cloudy seasons, it can work on charged battery power. You can charge the battery by power. Etc this fertilizer sprayer is very much a User-friendly device to make community partner work easy, Solar operated sprayer is environment friendly and cost-efficient, Quick spray of pesticides within less time, Zero electricity consumption, It is easy to operate and portable. We have taken this project with a vision to become global leaders by taking up society-based engineering projects and working for sustainable solutions. And with the following missions:

- To be inclined to social service using engineering skills.
- To come up with innovative ideas for reducing the pain of society.
- To be sensitive and conscious about societal structure.
- To work with society and experience dealing with ethical dilemmas

Technologies Involved in this Project: 1. Battery 20v, Solar Panel 40v, Double Motor, Solar Converter.

VI. CONCEPTUAL DESIGN

Before making a prototype of the solar purifier we have made a conceptual design like how the product should look and where all parts to be placed like batteries, Pump, Solar panel, etc basically conceptual design gives an idea about how the product should look like .

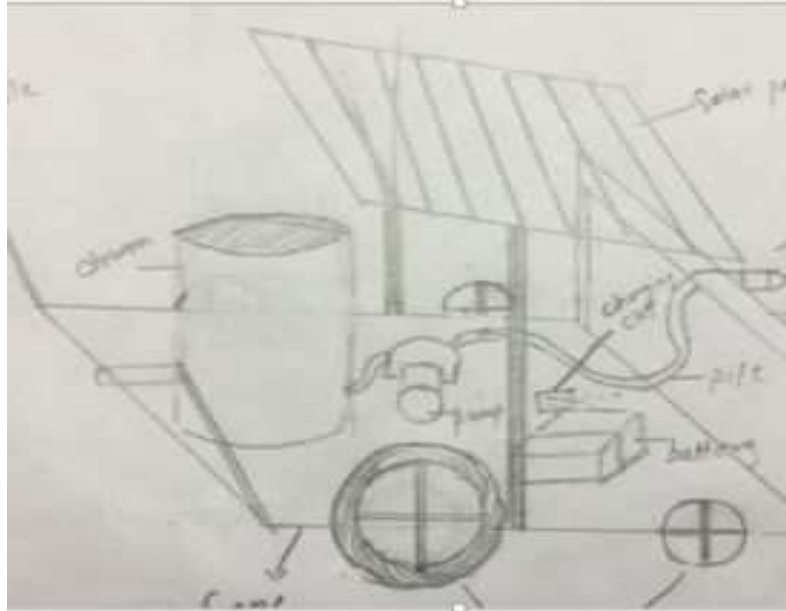


Fig.1. Conceptual Design

VII. DEVELOPING A PROTOTYPE

We have developed a Prototype in our Institute workshop. Developing a prototype/ Working model have taken nearly 3 Weeks of time.



Fig. 2 Developing Prototype

VIII. FINAL PRODUCT

After developing a prototype model (Fig 3) and after several trials in the farm about performance we have developed working a model and again performed trials result was positive.



Fig. 4. Final Product

IX. CONCLUSION

A conclusion section is not required. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions.

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