

Design and Fabrication of Multiple Applications Farm Machine Using Solar Energy- A Review

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Abstract: Agriculture sector continues to be pivotal in the sustainable growth and development of Indian economy. Not only does it meet the food and nutritional requirements of 1.3 billion people but it also provides employment to a major part of the population. This project is intended to help small-scale farmers to meet an increased demand for the different types of grains by designing a multipurpose farm machine. With this machine, we hope to provide farmers with a way to harvest grains on small farms and also along the periphery of the cities.

Keywords: multipurpose, crop care, solar energy .

1. Introduction

Agriculture is the backbone of India's sustained growth and development. Not only does it meet the food and nutritional requirement of 1.3 billion people but also provide employment to a major part of the population. As the population of India continues to grow, the demand for producing multiple cropping in farms has been growing which in turn demand advanced machineries

Farming has undergone great revolution in the last few decades. Over the various reasons involved for this evolution is the use of efficient machines. An innovative technology designed to make agricultural production more efficient and profitable. This machineries can make work easier but at the same time they are expensive. Now a days a middle class farmer can't afford to buy such expensive machines and the working of such machines is quite complicated which again demand time for learning.

2.1 Literature Review :

M.V. Achutha [1] This research paper provides information regarding the design and analysis of a multipurpose farm equipment which can perform operations such as sowing , inter cultivation , spraying for small scale farmers without huge investment and can be operated manually without any external source of energy . Nitin Kumar Mishra [2] Here the author has suggested a development of a multipurpose

agricultural machine which is easy in construction and are economical as it runs on solar energy. P. Vijay [3] This paper describes a machine which has better and effective design and can be used specifically for rice , wheat crops ,etc. D.A. Mada [4] In this paper author has tried to prove the importance of mechanization in agriculture by giving certain examples. The paper concluded the need of multifunctional single axel vehicle for pre and post harvesting. V.K. Tewari [5] In this research papers author has studied the ongoing procedures of farming in West Bengal. As the study was concluded in india it provides us with clear scenario about the agricultural advancements in India. David D. Wilson [6] Authors have mentioned the use of certain multipurpose machine which helps to derive our attention as to how attachments can be used for making a model more useful in efficient and sustainable way . Dr. C.N. Saklale [7] This review paper focus on the basic problems faced by farmers i.e. seed sowing, fertilizer spraying, cultivation and digging and motivating the idea for design of a machine which would use a engine for much faster and efficient working. 'Mohammad Muneer Uz Zaman' [8] Author has emphasized on designing parameters of the grass cutter and has done research on reduction of cost of the material to be used for designing of grass cutter. M.G.Jadhav [9] This paper focus on the design of a manually operated Multi nozzle sprayer which will have a weeder as an attachment to give optimum results in less time . Pushing mechanism require less efforts and 3-wheel mechanism used provides proper balancing to the machine. Dhiraj N. Kumbhare [10] Author suggests that the machine proposed will reduce cost and save time for spraying fertilizers efficiently on the crops at specific intervals. It also provides a safety factor for humans from the effects of chemical fertilizers and it also helps in reducing the human interference in the process. Siddharth Kshirsagar [11] This research paper focus on designing a machine which would be able to perform spraying operation more efficiently using pump driver linkage mechanism. Sanjay S [12] In this paper, author proposed a design for a model of a mechanical pest sprayer which can run without

any fuel and it is easy to operate by any unskilled person. Spraying is carried out by sprocket mechanism. Sandeep H. Poratkar [13] This paper focus on manually operated multi nozzle pesticide sprayer pump which is able to carry out spraying at a considerably high rate. Constant flow valves can be added at nozzle as a modification to have uniform nozzle pressure. Desa Ahmad [14] In this paper the author has studied the effect of various types of rotary blades based on their performance. The test is carried out in a dry-land field. Results concluded that soil clod diameter decreased and soil inversion increased with increasing rotational speed of the rotor. Mohd Ishammudin Bin Mohd Yunus [15] Paper is about the modified design of a grass cutting machine by using the DFMA methodology. The modification is expected to meet the drastic changes and meet the customer demands. Jonathan Kuje Yohanna [16] Study was carried out to evaluate the solutions to the problems of farmers owning a small piece of land, the study was carried out keeping in focus the farmers in developing nations like Nigeria. Adarsh J Jain [17] This project promotes the idea of mechanization of a Sugarcane harvesting machine. The machine is designed keeping focus on reducing the problems like high labour cost and making the process efficient and fast. Prof. P.B.Chavan [18] Project is to design a reaper machine The machine designed has a modified technology used which might help in harvesting the grains in less time and with increased efficiency of the machine. Research work focus on easy methods for harvesting operation on small lands. Mr. R. A. Ghumadwar [19] This research paper aims to design and analyse a small field crop cutter machine. This cutter can be effectively be used to cut crops at a small height. The analysis of the cutter is carried out using the softwares like Pro-E and Ansys. Gokulavasan [20] These project promotes the idea for a fabrication of a grass cutting machine which uses motor running using solar power . Photo-voltaic principle is used to charge the battery. Prashant G. Salunkhe [21] Project shows design of an Automatic Seed Plantation Robot whose working is based basically on electronic and mechanical backgrounds. An electromechanical vehicle which is steered by use of an DC motor. Mr. Shishir Mane [22] This research paper focus on design of smart seed sowing machine which can automatically sow seeds in the field. The machine is provided with a keypad to let the farmers provide a variable pitch as a input data. Kunal A. Dhande [23] This paper demonstrate a design of a machine with an easy method for seed sowing. In this project the complicated gear system is replaced by hall effect sensor for easier and affordable seed sowing. Jeevarathinam .A [24] This paper focus on analysis and optimization of rotary tillage tool. The analysis is done by use of FEA and simulation of the design is done by using CAD-software for the structural analysis. Paper gives a rough plan for the design and development of rotavator blade. A. R, Patel [25] This paper suggests that the author designed a model which is simple and versatile for use in different farm operations. A design of manually operated template row planter is discussed which can lead to improve planting efficiency and reduce the losses and efforts involved in manual planting method. Nitish Das [26] In this paper author focuses on developing a spraying mechanization which is able to distribute the pesticides and

fertilizers evenly all over the land. This technique can be helpful in reducing the waste content and eventually production will be cost effective. Shivaraja Kumar Parameswaramurthy [27] This is a paper providing a design of wheel and pedal operated sprayer. This technique if brought to reality can be used without the consumption of any type of fuel. The machine is also very easy to move by just the peddling. Miss. Shwetal Ramesh Gund [28] In this paper a study on the various agriculture based robots is documented. Various tests are carried out for the newly developed robot to be installed in the farms for the farming techniques to be automated. Aditya kawadaskar [29] This machine is developed keeping into consideration the need for the seeds to be sowed at a proper distance away from each other. This machine helps in sowing the seeds at a proper distance which can lead to the achievement of proper yield at a effective rate. D. Ramesh H [30] The instrument so invented in here is capable to determine the seed spacing and also the placement of seed at proper place. The machine is capable of drilling as well as placing the seeds i.e. it is very useful in sowing operation.

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