

DESIGN AND FABRICATION OF PADDY HARVESTER USING SOLAR PANEL

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ABSTRACT

The main purpose of our Project is to help small scale farmers who having land area less than 5 acres by designing small scale harvester machine to harvest grains very efficiently. Our project work will focus on ease of harvesting operation to the small scale farmers for harvesting varieties of grain in less time and at low cost by considering different factors such as cost of equipment, ease of operation, time of operation and climatic conditions.

INTRODUCTION

Manual labour takes time and is not effective as they can work for 3-4 hours at a stretch. Even if the land holding is small, it takes two or three days to completely harvest the soybean crop. Also the planting is not done with proper care. Hence the crops are strewn with a lot of non required plants, which grow with the soybean. So to harvest these unwanted crops along with the soybean is a tedious work. Given below is the traditional method of harvesting soybean. The main purpose of our Project is to help small scale farmers who having land area less than 5 acres by designing small scale harvester machine to harvest grains very efficiently.

LAND HOLDING:

Even though the adoption of farm mechanization is increasing in India, it is mostly region specific. Farm mechanization has a very low growth rate in regions such as hilly and sloppy land. The decreasing trend in operational land holding is

The power is generated from solar panel and stored in battery.

The power from the battery is supply to the motor and the motor is running and cut the paddy. This harvester might be the best solution for the problems faced by small scale farmers relating with availability of labors and cost of harvesting.

Keyword(s)- solar panel, dcmotor, cutting blade and battery.

also obstructing the growth of agricultural mechanization. High costs of machines and maintenance, non-availability of appropriate agricultural machines and equipment that cater to and suit the requirements of small scale farms, non-availability and or difficulty in getting bank credit and small land holding are some of the factors that hinder farm mechanization and force farmers to follow the traditional ways of agricultural operations. The use of farm machinery is also dependent on infrastructure and services available in the rural areas.

LITERATURE REVIEW

[1]Laukik P. Raut's et.al project made by student of GHRCE Nagpur. They made modern reaper at low cost which is beneficial and efficient for small land holder.[2]Arvind C.'s et.al paper made by student of BNM Institute of Technology, Bangalore. They provided design concept of Paddy harvester and calculation between conventional and modern harvester.[3]Dinesh B. Shinde, Ritesh D. Lidbe Manisha B. Lute, Shubham R. Gavali,

sharad S. Chaudhari, Shivani N.Dhandale⁶ They Design a mini harvester for small scale farmers who having land area less than 5 acres.

OBJECTIVE

Aim of this project is to design and develop small scale low cost compact harvester which reduce the overall cost of grain harvesting in the form of labour cost and harvesting cost. - To provide proper utilization of wastage which is useful for cattle. To reduce overall harvesting time as that of traditional harvesting time.

PROBLEM IDENTIFICATION

The Central government increased the price of petrol, diesel day by day. So the middle class people and low class people are affected. The rent for harvester is also high. They want many number of labour want to cut the paddy and the labour charge also high.

METHODOLOGY

As the requirement for grains is increasing is day by day, therefore the target was to create the machine which is affordable to each and every farmer, which is cheaper, efficient and will reduce the total harvesting cost. To achieve this aim, it is decided to follow the following

steps:

- To understand farmer's problem which they are facing about harvesting, for this it is decided to interview the farmers. So as decided we surveyed the farmers who are having land less than 5 acres.
- Design of small scale harvester.

The Machine Components:

The main components of small scale harvester are as follows:

1. Solar Panel
2. Battery
3. DC Motor
4. Cutting Blade

SOLAR PANEL

Photovoltaic solar panels absorb sunlight as a source of energy to generate electricity. A photovoltaic (PV) module is a packaged, connect assembly of typically 6x10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications.

DC MOTOR

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

BATTERY

Batteries convert chemical energy directly to electrical energy. A battery consists of some number of voltaic cells. Each cell consists of two half-cells connected in series by a conductive electrolyte containing anions and cations. One half-cell includes electrolyte and the negative electrode, the electrode to which anions (negatively charged ions) migrate; the other half-cell includes electrolyte and the positive electrode to which cations (positively charged ions) migrate. Redox reactions power the battery.

CUTTING BLADE

Cutter blade assembly consist of rotary cutter blade . The cutters used are of circular shape. In rotary cutter blade, cutter blade it is fixed in the motor. It allows rotary motion of moving blade to be in circular.

CONCLUSION

The main objective was to make simple, compact, efficient and low cost small scale harvester for small land holders. This machine fulfilled all objective and following conclusion were drawn on based of work:

On the basis of literature review, all specification regarding small scale harvester were meet. - After assembling the machine was tested on field for its efficiency and capability. the result got was as per our expectations from machine. - It is also concluded that machine was easy to control on the field.

- As this harvester is made to work at any condition where mega harvester cannot be reach and it meet to work in any condition with proper transportation facility due to compact size.

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