Design & Fabrication of Small Scale Sugarcane Harvesting Machine

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Abstract— Requirement of sugarcane crop is increasing because of the increase in population causes the increase in demand of sugar and its by-products regularly. We have selected the Sugarcane crop because it is not only popular in Maharashtra but also in India and our India is at first place of sugar supplier. The growth time for this crop is around 7 to 8 months from the day of its seeding and we can seed 2 times the sugarcane after pawing and parting after 2 times of sugarcane cutting we can use the area again but it needs pawing and parting again. The space remains in between the rows of sugarcane can be utilizes for other crops therefore it is mostly adopted crop and gives more profit in low time therefore we have selected this crop which may be helpful to solve the problems of our farmers.

Key words: Sugarcane Harvesting Machine

I. INTRODUCTION

We have decided to think about the problems related to agriculture field. This project is depends upon the requirement of farmers of small scale area because there are already some harvesters are available in market but it is for large areas and they are having a big purchase cost which is not affordable for small area farmers.

In Manual Harvesting to cut one acre of sugarcane 15-16 labors are required they take 3 days to cut one acre and involves harvesting of 60-70 tons per acre with labors being paid 500-550 Rupees per ton of harvest hence total cost of harvesting per acre comes up to 30,000-35,000 Rupees. Also the rent of tractor is Rs.1000 / Hr.

During the Research survey we have found that there are some machines are also available for small scale area farms of sugarcane crops so we have decided to use different methodology to provide the efficient work and low purchase cost.

II. LITERATURE SURVEY

A. In First Method

The Fuel from the tank is supplied to the Engine and the power is generated to the shaft inside the engine. The driver sprocket which is attached to the engine shaft rotates the driven sprocket through chain drive mechanism. The driven sprocket that is connected to the longer shaft will transmit the power to the either sides of the Bevel gears through the shaft. The longer shafts will be mounted between the two plumber blocks which provide support to the shaft. The rotating Bevel gears are in turn connected to the cutters through vertical rods which rotates the cutters. By this way the small scale sugarcane harvesting machine works. The operations involved are simple and easy to operate.

B. In Second Method

The engine can perform its cutting efficiency at an average speed of 1109.73 m /h. During harvesting the forward speed of sugarcane harvester was observed as 0.25 km/h with the fuel consumption of 20.03 l/h. The area of sugarcane cutting was 1109.73 m²/2/h. The percentage of sugarcane-cut stalks is 100% since the engine is installed with double blade so that all stalk is smoothly cut. A rotation speed of stalk-cutting blade is at a 1,090.5 rpm, a rotation speed of a leaf-cutting blade is at a 669 rpm and Table 3 shows the summary of harvester performances. The field test of harvester which is the cutting quality for stalks was satisfactory for a smooth cutting surface quality. There was found no fracture of vascular tissues, filaments in cutting locality, and cutting surface that was not clean and smooth a height from the ground of each cut stump, a smooth trace of each stump and a sprout of each stump after it was cut by the cutting blade.
the cane in the single windrow being oriented parallel to the path of travel of the vehicle in a uniform manner to enable an efficient mechanical harvesting of the windrow with little or no damage of the cane therein.

III. SUMMARY OF THE LITERATURE REVIEW
After reviewing various journal papers it was found that the existing machines was not economical, having less efficiency and the mechanism involved is complex. To overcome these problems this project work aims to develop low cost sugarcane harvesting machine which is more efficient and having simple mechanism for cutting the sugarcane at a faster rate. As well as to make the harvester which is affordable to every farmer which is low in cost and easy to operate.

IV. OBJECTIVE OF PROPOSED CONCEPT
To design and fabricate small scale sugarcane harvesting machine which is economical, more efficient and cuts the sugarcane at faster rate. And it will be helpful for small scale formers, unskilled labours can also operate without difficulty.

V. PROPOSED MODEL

![Diagram of Proposed Model](image)

Fig. 1: The Concept of Model Is Totally Secretive

VI. WORKING PRINCIPLE
To make the sugarcane harvesting machine with the removable assembly which is helpful to attach other mechanism for plowing and parting, and to provide the small scale sugarcane harvesting machine for small farms which is not only use to cut the sugarcane but it will also keep the caught sugarcane pieces in well manners. This mechanism will be made by the top cutter, bottom cutter, deflector, conveyor, rollers and trolley and the main aim of this project to make available the harvester in low cast in market.

REFERENCES