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"A Review Paper on Smart Solar Cutivation System"

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Abstract:

Solar energy and farming is a deadly combination. Wind, solar and biomass energy can be harvested forever, providing farmers with a long-term source of income. Renewable energy can be used on the farm to replace other fuels or even sold as a cash crop. It is one of the most promising and important opportunities for value-added products in agriculture.Solar energy can be used in agriculture in a number of ways, saving money, increasing self-reliance, and reducing pollution. Solar energy can cut a farm's electricity and heating bills. Solar heat collectors can be used to dry crops and warm homes, livestock buildings, and greenhouses. Solar water heaters can provide hot water for diary operations, pen cleaning, and homes. Photovoltaics (solar electric panels) can power farm operations and remote water pumps, light, and electric fences.

Keywords: Solar system, batteries, Pollution, radiation, vehicle, renewable energy, ploughing& fertilizer.

INTRODUCTION:

Increasing productivity is a major factor in each and every step of human effort; this has positive reflections in the form of new technological inventions; however, on the dark-side this has ruined the agriculture sector. Due to increase in domestic consumables, the wages of daily labor have increased tremendously with no change in the cost per bag of paddy. This situation if left unanswered would lead to food scarcity in India. Our project on solar cultivation equipment is a revolutionary machine which answers all the difficult. May it be sowing, ploughing, sprinkling of fertilizers or cutting of crops.

Our invention with this revolutionary Vehicle will answer all the above mentioned aspect with full justice. Our invention would be totally Economic and budget friendly for the farmers to buy and to maintain the vehicle.

NEED OF PROJECT: Solar Panel, batteries 24V-2, steering control, motor and shaft pair, motor blade

LITERATURE SURVEY

Mahesh R. Pundkar [1] stated that the seed sowing machine is a key component of agriculture field. high precision pneumatic planters have been developed for many verities of crops, for a wide range of seed sizes, resulting to uniform seeds distribution along the travel path , in seed spacing.

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P.P. Shelke [2] concludes that bullock drawn planters are becoming necessity for sowing as the skilled workers for sowing are almost diminishing. Planting distance and plant population are crucial factors in maximizing the yields of crops.

Ms. Lanka Priyanka [3]: In this paper they have fabricated grass cutting machine with tempered blades are attached to this grass cutter. This grass cutter is manually operated as well as automatic operated. The materials commonly used GI sheet, motor, wheel, Al sheet, switch, wire, square pipe and insulating material.

Xiujuan, et al [4] explained the advantage of electric vehicle is that the electric vehicle has zero discharge, low noise and wide source for energy supplement the transformation efficiency of the photovoltaic cell plate is very low (i.e.) 14% because of strong manoeuvrability the working environment of the solar car changes frequently algorithm of max power point tracking should be increased to get high transformation efficiency condition At present, the common maximum power point tracking methods are the constant voltages tracking method, the perturbation and observation control and the conductance increment method. The tracking accuracy of the conductance increment method is the best among them. It achieves the tracking of the maximum power point. It is obvious that the output power varying different area when we change the working voltage in the area of constant current source the sensitivity is low and in constant voltage load the sensitivity is obvious so the tracking method should be improved In order to improve the accuracy of the maximum power point tracking, when the temperature and the light intensity are definite, and the output power of the photovoltaic cell is close to the maximum power which is the most at the current condition same extent, the tracking step length will be properly lessened , in order that the maximum power point can be tracked more accurately

Yesil, Engin, et al.[5] The employment of Big Bang – Big Crunch optimization method in World Solar Challenge is proposed in 2013. Renewable energy resources it is important to optimally utilize them in an efficient way Istanbul Technical University (ITU) Solar Car Team was founded in 2004 not only to practically design solar powered cars, but also to demonstrate how efficient an electric car could be and to promote the importance of clean energy. In order for a solar team to come in first place, solar car motor with a durable structural design and realistic estimation the optimization task. Low speed profile in case of cloudy weather, high in case of sunny conditions High speed profile in case of cloudy weather, low in case of sunny conditions, Constant speed throughout the race. The aim of the study is to determine an optimal strategy to minimize the race duration while supplying the race regulations and the constraints imposed by the environmental conditions.

OBJECTIVE

- We aim to design a project which sufficiently follow all the listed. Points.
- Easy operation: No skilled persons are required.
- Eco friendly: Works on solar power.
- Multi-purpose: Plowing, spraying and cutting of crop can be performed in a single machine.
- Low maintenance cost: Any electrician can solve the issues.
- Less capital required: Machine cost can easily be earned in two crops i.e. one year.
- Reliability: Life of solar panels is about 15 years which is the costliest component.

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METHODOLOGY

- **E- VEHICLE**

Our Vehicle would be running on solar Energy which would be stored using the rechargeable batteries. Electric vehicle drives offer a number of advantages over conventional internal combustion engines, especially in terms of lower local emissions, higher energy efficiency, and decreased dependency upon oil. There is plus point of having solar powered Vehicle at farmlands because these lands are open to sky so maximum solar radiation may it be direct or diffused. Maximum intensity of the radiation would be used to drive the vehicle. To increase the power of the vehicle we would require a large no. batteries and solar panels.

- **PLOUGHING**

The vehicle would be having a detachable ploughing machine which would make the ease for the farmers to plough the plot. That too with increased efficiency of the work as the process would be much faster with perfect measurements of the boxes on the ground to sow the seeds so as to have maximum crop plantation.

- **SOWING**

The next step after ploughing is sowing of seeds. As an when ploughing is completed. The seeds can be sowed with the detachable deep sowing funnel to make the seed be in the perfect depth of the soil to have the maximum root growth so as to have maximum growing capacity.

- **SPRINKLING OF FERTILIZERS**

Carrying those have heavy Fertilizer bag on the back is the most tedious work to do. To reduce this we will be having a section on the vehicle to keep the bag and the spraying sprinklers would be placed tangentially so that maximum amount of fertilizer can be used by the crops.

- **HARVESTING**

Harvesting every crop individually is very time consuming and sometimes this required time result in failure of the crops (generally rain). To make this process easy and faster we would have a detachable grass cutting blade/machine which would easily cut the paddy that to in lesser time as compared to the traditional method. This mechanism will be placed on the front side of the vehicle and would be operated by the driver.

Detachable plough and sowing machine

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Spraying of Fertilizers

Prototype model of the project

CONCLUSION:

After many research work and working on the methodology we finally concluded the methods to go ahead with the project. We finally got a perfect design for a vehicle to be used for cultivation which meets all the demands required to be filled.

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