

# Automatic Solar Operated Shed

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**Abstract-** We all of us know that India is an agricultural country. As most of us belongs to the agricultural background, so we are very closely related to the problems which are occurs in agricultural areas. Agriculture is the backbone of Indian economy and about 75 Percent population. From previous some years, the rain falls not only in the rainy season but also in summer and winter at any time suddenly. Many of the farmers suffered due to this uneven rainfall. This uneven rainfall can damage harvested crops. When rain comes During excessive rainfall the mostly occur problem is to stored harvested crops, we cannot put it in open surrounding as it got damage and can give less profit to farmers. some problem can be faced by shopkeepers due to Globalization or due to increase population land to farmer ratio is decrease day by day so the Farmer cannot be making special shed to store crops or for pets. we come to solution to design shed. And reduce the effort to operate the shed we make it automatic. And to make our project environment friendly we using solar instead of electricity. It can be used in agriculture where we don't want all time shadow and to protect agricultural animals from rain. Incan be avoid shifting of place of agricultural animals during rainy season. It can also be useful for harvesting crops like onion that harvested in rainy season.

**Keywords-** Agriculture Country, Harvesting Crops, Automatic Shed , Environment Friendly.

## I. INTRODUCTION

Agriculture is the backbone of Indian economy and about 75 Percent population totally depended on agriculture and our water resources are maximum as compared to any country of this size but we are facing severe drought and flood alternately and simultaneously in different parts of the country. We all of us know that India is an agricultural country. As most of us belongs to the agricultural background, so we are very closely related to the problems which are occurs in agricultural areas. India has a large area of agriculture and also receives a very much amount of rainfall. Now-a-days from previous some years, the rain falls not only in the rainy season but also in summer and winter at any time suddenly. Many of the farmers suffered due to this uneven rainfall. This uneven rainfall can damage harvested crops. When rain comes During excessive rainfall the mostly occur problem is to stored harvested crops, we cannot put it in open

surrounding as it got damage and can give less profit to farmers. As we know farmers having more pets so they cannot put them outside, we have to keep them inside in the safe place. Also, during rain farmers cannot tie their pets outside they need to tie them in shed. And they cannot be tie at the same place in shed for all time. Due to cleanliness problem regarding their health and our health to.

## II. LITERATURE REVIEW

### 1. P. Abhil Published paper on, “Automatic rain sensing car wiper”.

In this paper, they proposed an automatic rain sensing wiper system that detects rain and starts automatically and stops when the rain stops. The automatic rain sensing car wiper system is not only automatic but also intelligent. The wiper system detects the rainfall automatically and starts itself. The Wiper system is also intelligent. When the droplets of rainfall on the sensor, the sensor detects the intensity and the speed of the wiper are automated accordingly.

### 2. Kushali Sindhia Published paper on, “Design of Smart Rolling Shutters for Low-Cost Operations”.

Roller shutters have many applications some of which include factories, garages, schools and warehouses. The project prescribed provides excellent security benefits and in regions exposed to inclement weather, it can also be used as a method of insulation. Studies show those automatic roller shutters already in market have been the cause of a large number of accidents over the years.

### 3. B. Gohil Published paper on, “Solar battery charger”.

In this paper solar battery which connect to the supply line parallel of the solar battery charge. This project give idea about non- conventional Energy sources and why we are going for that non-conventional energy sources. The electricity necessities of the world including India are elevated at disturbing rate and the power demand has been increasing.

### 4. G. SanthoshKumar Published paper on, “DC motor speed control using microcontroller”.

The hardware project is designed to control the speed of a BLDC motor using closed loop control technique. The user can enter the desired speed and the motor will run at that exact speed. The hardware for closed loop control of BLDC motor using microcontroller is designed. By using the PWM technique speed of the BLDC motor was controlled and it was made to run at exactly entered speed.

### 5. Saswat Kumar Das, Published paper on, “Automatic Garage Door Opener”.

The goal of this project is to make a sustainable modification to the garage door in order to reduce the human effort while their opening and closing and also to increase the safety of the garages. This modification on is not limited to only garage door but it can be applied to several doors which are of the sliding and rolling nature.

## III. EXPERIMENTAL SETUP

### 3.1 PROBLEM STATEMENT

1. Farmers stores harvested crops in the open atmosphere, so there is most chance of damaging of harvested crops due to environment changes.
2. We cannot put pets outside in rain and don't place them inside the shed for all time, due to cleanliness problem regarding their health and our health too.
3. Those farmers having less land for farming they can utilize this space for farming other than harvesting period.
4. Some shopkeepers keep their goods outside of the shop due to space limitation and as rain comes put this good in the shop.

### 3.2 OBJECTIVE

1. To Reduce effort of farmer to tie their animals/pets in and out of shed during rainy season. during Rainy season Due to cleanliness problem regarding their health and our health too.
2. During Sudden rainfall farmers unable to cover harvested crops. So, it reduces the efforts of the farmer to cover the harvested crops as shed automatically covers the crops.
3. To reduce the effort of shopkeepers to put their goods in and out of the shop during sudden rainfall.

### 3.3 SCOPE OF PROJECT

1. It is mostly useful for farmers community.

2. It can be used in agriculture where we don't want all time shadow and to protect agricultural animals from rain.
3. It can be avoid shifting of place of agricultural animals during rainy season.
4. It can also be useful for harvesting crops like onion that harvested in rainy season

### 3.4 WORKING

1. The rain sensor is fixed on the frame. During rain when drops of water fall on the sensor this rain sensor is detect amount of rain and give the signal to the rain sensor Module. The ADC in the controller detect the input and gives the signal to the circuit.
2. The signal is further sent to the motor. The motor driver actuates the motor to run at high speed or low speed based on the amount of rain level, by connecting an L298 bridge IC to an Arduino, we can control a speed of DC motor so it is easy to operate motor automatically at adjustable speed . DC motors normally have just two leads, one positive and one negative.
3. When the motor run according to the conditions it will either roll in or roll out the sheet over the frame, which is singled by the microcontroller in setup. During the rotation of motor which is connected to the roller wheel which will tend to roll the sheet up to the defined distance and get stops.
4. To perform this operation here battery is used. The battery supply electrical energy to whole the project during its operations. Battery stores electrical energy received from solar panel which is connected to battery with blocking diode. The stored energy in battery which is utilizes to run the dc motor whenever needed to perform the operation of rolling the sheet around the roller wheel.
5. For charging of battery here is a solar panel. The available power in battery which is collected by solar panel during all the day which will useful in Night and the condition where there is no electricity.
6. Sunlight hits the solar panels, and creates an electric field. The electricity generated flows to the edge of the panel, and into a conductive wire. The conductive wire brings the electricity to the battery where it gets store, which is used during the operation of the project.
7. During this process there's another member which is named as blocking diode which is used to prevent your batteries from discharging backwards through your solar panels at night. When the sun is not shining the charge controller will block current from

flowing from the batteries to the solar panel. This prevents the batteries from discharging into the solar panels.



**FIG 3.1 : PROPOSED 3-D SIMULATION MODEL**

#### IV. COMPONENTS USED

1. Rain Operated Sensor
2. Motor
3. Battery
4. Blocking diodes
5. Solar panel

##### 1. Rain Operated Sensor

- a) When drops of water fall on the sensor this rain sensor is detect amount of rain and give the signal to the rain sensor Module.
- b) The signal is further sent to the motor.
- c) The motor driver actuates the motor to run at high speed or low speed based on the amount of rain level

##### 2. Motor

- a) A direct current, or DC, motor is the most common type of motor.
- b) Bidirectional DC Motor controllers allow to switch the direction of the current flow through the motor coils, enabling to make the motor turn in either direction, while controlling the speed.

##### 3. Battery

- a) Battery stores electrical energy received from solar panel.
- b) Utilized this energy to run the dc motor whenever needed.

##### 4. Blocking Diodes

- a) Blocking diodes are used to prevent your batteries from discharging backwards through your solar panels at night.
- b) When the sun is not shining the charge controller will block current from flowing from the batteries to the solar panel.
- c) This prevents the batteries from discharging into the solar panels.
- d) As a result, in the days before charge controllers, people would put a blocking diode in series between the battery and the solar panel, only allowing power to go into the battery.

##### 5. Solar Panel

- a) Sunlight hits the solar panels, and creates an electric field.
- b) The electricity generated flow to the edge of the panel, and into a conductive wire.
- c) The conductive wire brings the electricity to the battery where it gets store.
- d) The available power in battery which is collected by solar panel is useful in Night and the condition where there is no electricity.

#### V. APPLICATIONS

##### 1. Farming sector

- a) In farming the harvesting of crops is most important thing whole time but storing this in a safe place is a challenge to them because of sudden rainfalls and rain is not comes only in rainy seasons but it may also occur in other seasons so we have to prepare for that condition.
- b) It's not only for storage of crops but this is also we can utilize to Those farmers having less land for farming they can utilize this space for farming other than harvesting period.
- c) There is another problem which farmers face in daily life that the proper place for their pets. We cannot put pets outside in rain and don't place them inside the shed for all time, due to cleanliness problem regarding their health and our health too.

##### 2. Commercial sector

- a) Some shopkeepers keep their goods outside of the shop due to space limitation in the store and it will lead to damaging of the goods as rain comes.

- b) At the time of rain coming there's no possibility that anyone should present to cover all the good and protected them it will take time and man power too.
- c) So, to avoid the miscarrying of goods it's good to place the goods in a space where such kind of mechanism is used which will lead to cover automatically all the goods when there will be rain.

## VI. OUTCOMES AND RESULT

1. From this project farmers will be able to store their harvested crops safe place in any season.
2. It will be helpful to shopkeepers to reduce their effort to place goods inside that are place outside in rainy season.
3. Cleanliness issue of the farmers pets place will be solved as this place is open to sun also.
4. This will be also overcome the less land issue of the farmers as no extra space required for shed.

**Table 6.1 : Result Table**

Sr.No.	Complete Extension (Sec)	Complete Retraction (Sec)
1	10.26	13.91
2	10.24	13.87
3	10.28	13.96
4	10.30	13.97
5	10.32	14.01

## VII. CONCLUSION AND FUTURE SCOPE

### 7.1 Conclusion

In our project we have done solar operated shed run with the help of solar panel, battery motor and rain operated sensor to opening and closing of shed.

Day by Day development happen in future, so we need shed for harvested crops and pets also. Therefore, we are adopting advanced technology by making shed automatic and to reduce human effort also.

Our project uses Renewable energy source so that it is eco-friendly.

### 7.2 Future Scope

1. Certain modification can be done like Solar panel shape and size, Battery capacity, motor capacity

company and rain operated module microcontroller and other components.

2. Advanced versions of solar panels like Solar flat plate collectors as well as cylindrical parabolic collector and paranoid mirror array and arranging array in series increase the drastically change the capacity of solar panel due to array increase.
3. As well as reduce the electricity consumption and saving energy and cost reduction it is beneficial for the large agriculture areas also help to this project.
4. Reduced the farmer effort and to concentrate on another work very freely and there is no failure issue happen of covering crops as well as pets.

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