

## Solar Based Agricultural Sprinkler

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**Abstract** - With the increase in population day by day the number of vehicles also increases which have more contribution towards the increase in noise and air pollution. To reduce the same or to maintain it within the limit the researchers are taking efforts for finding some solution or alternate method, which leads to the development of new things or some modifications in the existing thing. As the major source of pollution are the vehicles, therefore by limiting the scope of pollution to the vehicles only the three different configuration of reactive silencer is designed by modifying the tuning chamber which is the main cause of attenuation and the result recorded for noise level production and pollutant produced and by compared with the standard silencer provided by the manufacturer and the optimum design of reactive silencer is proposed which has comparatively less noise at low back pressure with producing low pollutant.

**Key Words:** Solar Pump, Sprinkler

### 1. INTRODUCTION

Solar energy is a free, inexhaustible resource that is environmental friendly and serves as an alternative to the increasing demand in energy usage throughout the world. According to latest figures published, the surface of the earth receives about solar power. That amount of value is higher than all of energy generated in the earth. This has encouraged the application of solar energy in various sectors and one such important application of solar is in the industry of agriculture for the purpose of irrigation. Irrigation or watering system powered by Photovoltaic panels on a small level. The project constitutes of electrical part and mechanical part. The electrical part consists of Photovoltaic panel, a device to store energy such as battery, and other required electronic. Solar. The purpose system uses the solar energy to on the water pump. The purposed system uses solar power to engines the system and pump to spray pesticides / water on the crops. Solar power is used only the source of power to control the overall system. Solar energy is the most abundant source of energy in the world. Solar power is not only an answer to today's energy crisis but also an environmental friendly form of energy. Photovoltaic

generation is an efficient approach for using the solar energy. Solar panels (an array of photovoltaic cells) are nowadays extensively used for running street lights, for powering water heaters and to meet domestic loads. The cost of solar panels has been constantly decreasing which encourages its usage in various sectors. One of the application of this technology is used in irrigation systems for farming. Solar powered irrigation system can be a suitable alternative for farmers in the present state of energy crisis in India. This a green way for energy production which provides free energy once an initial investment is made

### 2. Energy Budget

Solar energy is the most abundant source of energy in the world. Solar power is not only answer to today's energy crisis but also an environmental friendly form of energy. Photovoltaic generation is an efficient approach for using the solar energy. Solar panels (an array of photovoltaic cells) are nowadays extensively used for running street lights, for powering water heaters and to meet domestic loads. The cost of solar panels has been constantly decreasing which encourages its usage in various sectors. One of the application of this technology is used in irrigation systems for farming. Solar powered irrigation system can be a suitable alternative for farmers in the present state of energy crisis in India. This a green way for energy production which provides free energy once an initial investment is made

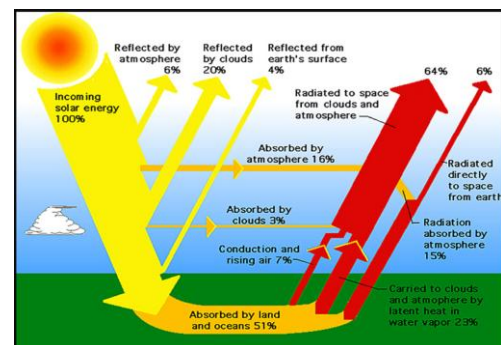


Figure 1: Earth Energy Budget

### 3. Problem definition

Pesticides effects human health seriously in order to avoid major health issues it is necessary to keep the pesticides tank at a distance from human body. In our project we have designed the model in such a way that the tank of pesticides is at a very safe distance from human body hence, there is no chance getting health issues. Continuous pumping of pesticides with the help of hand causes excessive fatigue to the operation. To avoid fatigue, we have placed a battery to give electric supply to the pump which through water with pressure toward the shower. In order to avoid direct contact with pesticides we have designed our model in such a way that there will be indirect on we contact with pesticides.

### 4. Objectives/Design constraints considered

- Design a sustainable low cost, low power for farming or agricultural / gardening
- System should use power from green energy.
- Minimization of cost.
- Designing according to landscape.

### 5. Working Principle

The solar radiation coming to the earth is accepted by the solar panel and it is converted into electric current (direct current). There is one solar panel in which each have 10-watt specification. This produces the power of 10 watts.

The direct current is available now but for our application of motor demands alternating current supply. Now to convert this direct current into alternating current the inverting circuit is introduced. The output of this inverting circuit is then given to electric motor. This motor is connected mechanically to the pump. Pump converts the mechanical movement into hydraulic power. This power is nothing but pumping of water. This high-pressure water is then allowed to pass through the perforating pipes which is connected from the tank and the other end to the shower.

### 6. System Design:

This System consists of a Solar panel, which is the main source of energy and is given to the charge controller for extracting regulated power from Solar panel at different irradiation and also to maintain correct charging voltage and current in order to charge the battery and increase its life. The irrigation system and proposed block diagram shown in figure 2.1. When the switch is closed then the current flows in clockwise direction through the inductor and it stores some

energy by generating a magnetic field. The irrigation system consists of solar panel, battery, water pump, and shower.

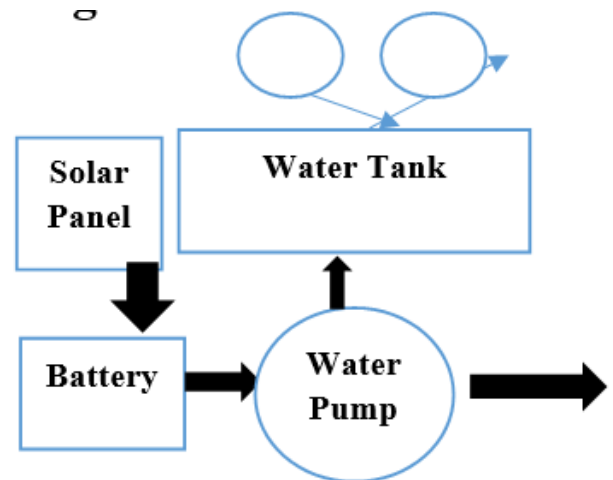


Figure 2: Block Diagram of System

### 6. Conclusion

It can be implemented through low cost, and it uses alternative source for electric power. This research is solely done in order to reduce reliance on grid supply and using sunlight to furnish rice crop. If farmers are generating more energy through solar panels they can sell to national grid or it can be utilized by their own house consumption. This system requires minimum maintenance and is easy to implement and is very simple. It will save a lot of electric energy supply given by government to farmers for tube wells, and less oil will be imported due to not using it for irrigation purposes. And also, water preservation will be done and a lot of wastage of water will be stopped.

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