

Automatic Irrigation System

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ABSTRACT

In this proposed paper, the system contains the solar-powered water pump with a moisture sensor to help in the flow of water during irrigation time. It's a system which is beneficial for a farmer as well as the economy also because due to this crop will grow healthy and farmer workload will decrease. As solar energy is used farmer needs only one-time investment and they don't have to depend upon electricity, which is a very poor condition in India, especially in rural areas. Water problem is also sorted by efficient water use.

Keywords: Solar power, moisture sensor, solar-powered water pump, economy.

INTRODUCTION

In this world, "solar energy is the most abundant source of energy." It is renewable and also eco-friendly form of energy [1], [2]. For all our requirements of energy, the only solution is profitable solar power. The purpose of the paper is to minimize the manual involvement of farmer during the irrigation process and also to promote the use of eco-friendly resources. Irrigation is one of the most important infrastructural sectors basically a primary sector [3]–[6]. It means supply of water to crops by artificial means or by technology. Different methods have been used for irrigation purpose. From use of manual irrigation to motor based irrigation. These motors are driven by diesel, coal, propane or by conventional electricity.

As these are non-renewable type of resources they can't be used for a longer period. But now a days use of diesel-based pump have reduced significantly and solar based pump is now starting to dominant the science era [7]–[9]. It is still being studied and developing throughout the course. Due to its high cost it is being neglected by most of the farmers but its durability is long lasting upto 5 decades even more depending upon its specification. It operates automatically driven by micro controller feeded with instructions. Physical interaction is minimum. The dependence in the use of diesel and conventional electricity is not mandatory anymore. The electricity generated from the solar panel or photo voltaic cell is used for power purpose. Reduction in the use of diesel has minimized the level of pollution on the surrounding there by helping crops and soil maintain a standard basicity level.

It is well known that India is among one of the largest developing economies in the world. The biggest role that plays in the Indian economy is the agriculture sector of India [10]. Therefore, to maintain and to reach the top of the economy list it's mandatory to update and improvise the agriculture sector by implementing new technologies that could make a huge change in building a great economy with great ecological balance. In India, farmers fail to produce the crops because they depend on rain which is uncertain nowadays that causes either drought or flood which effects the harvest severely. So, the right amount of water level in the soil is necessary while irrigation for proper productive farming. The time has come to use renewable energy plus uses every drop of water efficiently, so it can be used by our coming generations.

Working Methodology-

The main motivation behind this system is to use effective manage the amount of watering of the plants in efficient way. The basic of this work has to do with the application of knowledge in the electrical engineering field with the use of electronic systems in order to help in the development of plant life. The government in India is also motivating farmers to use solar based irrigation by launching schemes.

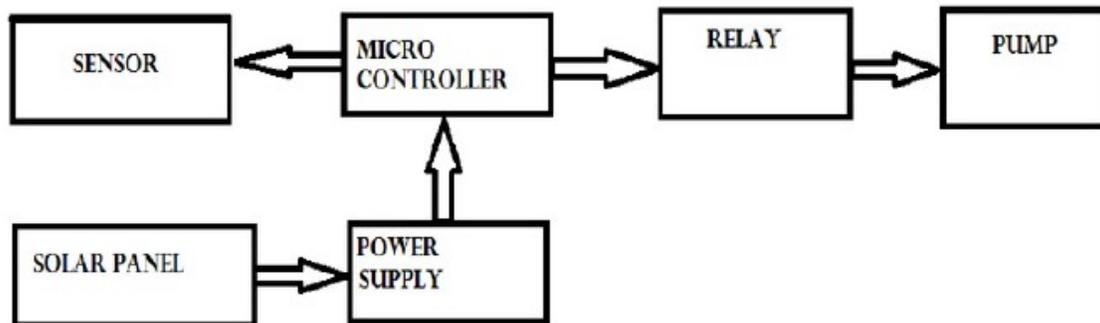


FIG.1 Block diagram of the automatic irrigation system

For power generation purpose a solar panel was used of rating 4 watt. After storage of energy in the photovoltaic cell it is transferred to the battery via a diode. So that the current does not reverses back. As after some time when the battery will attain a higher potential than that of the solar panel (especially at night time) then only the current will flow backward. After that the battery will supply 12v to the voltage regulator to bring it down to 5v.

CONCLUSION

In this paper, the developed system has tried to strengthen the backbone of agricultural productivity i.e. irrigation. The system dealt with the efficient and smart usage of irrigation facility to surplus the demand for agricultural products. How one can sense the atmospheric condition and implement them into the agricultural practices, how we can actuate the need of the agricultural land, using the stored water in an efficient way was our prime objective and we as a team have achieved our requirements parts and partially with some experimental errors. We have also thought of making a product taking this project as a skeletal framework for the same. Bringing out some kind of extraordinary performance from the product can really help those who are close associates with the field of agricultural practices.

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