Solar Powered Automatic Irrigation System

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Abstract- *Beneficial solar energy can be an answer to all your energy needs. Intelligent solar irrigation system means the answer to Indian farmers. Using a moisture sensor, the system is equipped with solar water pumps and automatic water flow control without visiting the rice fields.Farmers can get information at the water level. Depending on the water level, check the engine by sending messages from farmers to their mobile phones, even phones from remote places. However, if the water level reaches the danger level, the engine will start automatically without confirmation from the farmer to guarantee the correct level of water on the site. It is the solution proposed to the current energy crisis for Indian farmers.*

Keywords- Smart irrigation, solar power, moisture sensor, microcontroller

I. INTRODUCTION

Solar generated energy is the world's largest energy source. Solar energy today, answers not only on the energy crisis but also in the environmentally friendly format Energy automatic irrigation systems. In general, for the growth of all trees in the season, water is kept at the right level. Even when the farmer is away, this automatic irrigation system always ensures the level of level in the sites. In addition, it provides highest possible water usage (wasting very little while working or producing something) by watching/supervising soil moistures at best level. This is a green path for energy production, in which initial energy is provided is invested. In this letter, we propose a solar powered controlled irrigation system. Sensor gathers information about water level, update the paddy fields to farmers as well as microcontrollers. Farmers can also start the motor based on water level from distant places. However, using a cell phone, when the water level reaches the hazard level, the system will automatically start to ensure the correct level of water in the paddy field. This paper has been divided into literature surveys, proposed solutions, implementation, cost analysis and sections discussing results and conclusions, references.

II. LITERATURE SURVEY AND BACKGROUND STUDY

According to the survey conducted by the Office of Electricity in India 2011 up to 18 million agricultural pump equipment for the year and about 0.5 million new connections are installed with an average capacity of 5HP. The total annual consumption of the sector in agriculture is 131.96 billion kWh (19% of total electricity consumption). They assumed that the role of intelligent solar irrigation technology is the future of farmers and the solution to the energy crisis. So, for the proposed solar energy system, we are using techniques analyzed on paper and modified. Without a PWM technique, the operation of the inverter has been used for a minimum of harmonics, as indicated in the document that further increases the efficiency of the system. The evaluation of the system was calculated according to the specifications of the pump that refer to the paper. India is an agriculture based country. Productivity and quality of field-based products should be improved. The proposed project is an automatic system that helps the process to the famers for irrigation, notify the farmer through a screen and the LCD message that is sent to the farmer's cell phone number. This proposed project is also useful for farmers facing problems of lack of energy to maintain a uniform water supply due to lack of electricity or a social and not inadequate application. Solar energy has become a viable source of renewable energy in the last decades. This device can be a turning point for our farmer’s .Solar cell is easily accessible to farmers in the country. This proposed project is useful for the reduction of human work. This is a low budget with a certain system that is now used for various applications, such as emergency lighting, water heaters and industrial applications. It is an economical source of energy. This document proposes an automatic irrigation system based on solar energy. The main objective is to design an irrigation system with low cost and time based on the basis of microcontroller.

III. PROPOSED WORK

Figure 1 shows a complete block diagram of the proposed automatic irrigation system. There are generally several hundred hectares of area in the fields of rice. To cover the entire area, we need to put several sensors in rice fields. Sensors will always detect the water level of the region and send messages to the user's cell phone to inform the irrigation status through the GSM module.

To run this proposed system, a photovoltaic (PV) cell is the only energy source. Energy will be stored in the DC battery through the power supply. Sensors, microcontrollers

and mobile phone interfaces and the pump is driven on DC current.

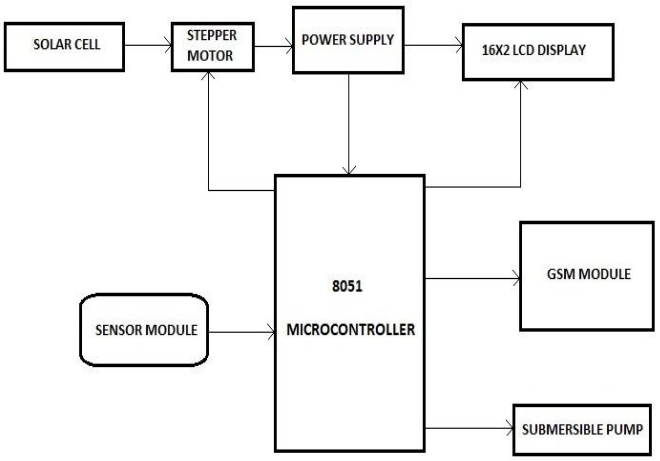

Fig. 1: Complete block diagram

IV. SYSTEM DESCRIPTION

The proposed irrigation system comprises mainly two modules, one solar pump module and one automatic irrigation module. In the solar pump module, a solar panel of specific request is located close to the pump assembly.

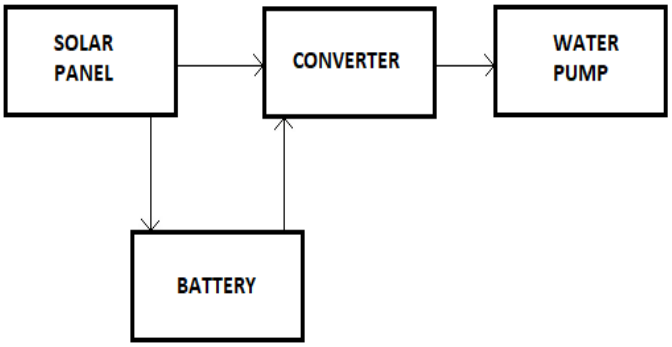

Fig. 2: Block diagram of solar pumping module.

When a control circuit is used, it is used to charge the battery. Using the converter circuit, a battery gives power to the water pump. Then, water is pumped into irrigation field. In the automatic irrigation module, tank water outlet valve is electronically controlled by soil moisture detection circuit. The sensor is kept in the area in which the crop is grown. The sensor converts the moisture content into the equivalent voltage in the soil. It is an identification circuit with reference voltage that the farmers can adjust for each crop to determine the different nights.In order to extract maximum energy from the sun, steeper motor is interfaced, which will rotate the solar panel proportional to sun.

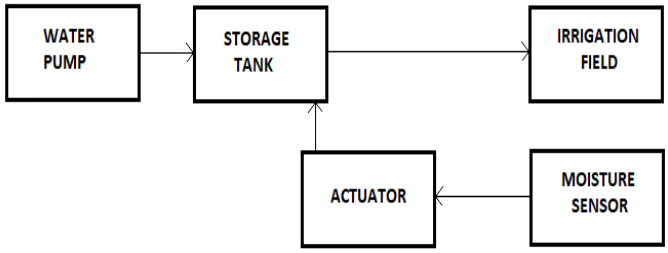

Fig. 3: Block diagram of automatic irrigation module.

In the beginning, microcontroller will check the sensor status. If the sensor detects the water level in the threshold, which means that the rice field has enough water, the microcontroller will not make any decision.

However, if the water level reaches below the threshold, then a message will be sentto the farmer that the pump is on and it will continue till it reach the above mentioned threshold limit. Once the moisture has regained its threshold limit the pump will automatically turned off and system will again send the message to farmer about the field status. In this way, the cycle will be constantly followed by microcontroller.

V. CONCLUSIONS

In this document, an automatic irrigation model is proposed and successfully implemented using different circuits. We have prepared and implemented this model by taking this model under low cost, reliability, alternate power sources and automatic control. Since the proposed model is automatically controlled, it will be helpful forfarmers to use their fields to irrigate properly. The model always guarantees adequate water level in the field of rice, avoids irrigation and excessive irrigation. Farmers can remotely ON/OFF system users using the phone at a distant. SoSolar energy provides enough energy to power the system. In order to overcome the need for electricity and to facilitate irrigation system for our farmers, Proposal of this model can be a suitable option. In this document, an automatic irrigation model is proposed and successfully implemented using different circuits. We have prepared and implemented this model by taking this model under low cost, reliability, alternate power sources and automatic control. Since the proposed model is automatically controlled, it will be helpful forfarmers to use their fields to irrigate properly. The model always guarantees adequate water level in the field of rice, avoids irrigation and excessive irrigation. Farmers can remotely ON/OFF system users using the phone at a distant. SoSolar energy provides enough energy to power the system. In order to overcome the need for electricity and to facilitate irrigation system for our farmers, Proposal of this model can be a suitable option.

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