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Solar and Wind Hybrid Agricultural Automation Using Iot

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Abstract **- Agriculture was the augmentation in the rise of sedentary human civilization. Farmers are unaware of technology and lots of efforts are being made by farmers to enhance the productivity. So to overcome this problem we propose a system based on Internet of things to make smart agriculture by modernizing the current traditional methods of agriculture. The main aspect of this project is that system could automatically work according to obtained measurement values and send regular updates and alerts about the farm conditions to owner's mobile phone and also alternatively controlled via designed website for better understanding of field. In addition to this , demand for electricity is increasing day by day ,which cannot be fulfilled by non- renewable energy sources. So hybrid renewable sources are use to fulfill this energy demand. These sources combines wind turbines and solar system to generate electricity.**

Index Terms **- Internet of things, smart Agriculture, sensors, ATMEGA 16.**

I. INTRODUCTION

In day to day life energy crisis is the main problem. Conventional and non-conventional energy source are different type of the generating electricity. Power generation system using the internet of thing IOT help in monitoring system by providing the different parameter of plant in IP address. Since solar and wind are the most available forms of renewable energy. Wind and solar are used for generation power called as wind hybrid system. Wind is form of solar energy wind are causes by in regular heating of the atmosphere by the sun.A solar wind turbine can generated some amount of electricity in KWH or Kilowatt hours as thousand of solar panels. Running cost is low and initial cost is high. Energy created by wind turbine is converted into AC power with and in inverter. Fencing is used to keep out wild life that may it or damage the crops. It is also used to help to control live stock.

II. LITERATURE SURVEY

The author [Rashid Al Badwawi , Mohammad Abusara, Tapas Mallick],"A review of hybrid solar PV and wind energy system (2015)". Solar and wind power is capricious in nature, higher access of their types in existing power system could cause and create high technical challenges. By integrating the two renewable solar and wind resources the in particular system becomes more reliable and cost effective to run. The author [Sunanda Sinha, SS chandel],"Review of recent trends in command interpreter techniques for solar photovoltaic-wind based hybrid energy systems (2015)". An update literature review on inclination in optimization techniques used for the design and development of solar photovoltaic- wind based hybrid energy systems is relevant.

III. WORKING

Solar cell will generate energy from solar panel and wind mill will generate energy from wind turbine. These solar panel and wind turbine convert energy into electricity. These energies will get combine and pass to charge controller. It will control the amount of charge generated by solar panel and wind turbine and the energy is then stored in battery which is of 12V . Battery Level, Water Level and Temperature these are the sensors which are connected to ATmega 16.

1. AT mega 16

Fig.1 AT mega 16.

ATmega16 is an 8-bit high performance microcontroller of Atmel's Mega AVR family which has low power consumption. Atmega16 is based on enhanced RISC (Reduced Instruction Set Computing) architecture which

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includes 131 powerful instructions. Most of the instructions execute in only one machine cycle. Maximum frequency of AT mega is 16MHz.ATmega16 has 16 KB programmable flash memory, static RAM of 1 KB and EEPROM of 512 Bytes. ATmega16 is a 40 pin microcontroller. There are 32 I/O (input/output) lines with four 8-bit ports designated as PORTA, PORTB, PORTC and PORTD.

2. Sensors

2.1 Battery Level- It will give information about a battery. It will also check battery status. This will usually be a visual indication of battery's state of charge. It is basically a voltage divider sensor.

2.2 Water Level- It is used to detect level of liquid. Level sensors measures level within a specified range and determine the exact amount of substance in a certain place. It is basically a float switch.

2.3 LM35 Temperature sensor- The operating voltage range of this LM 35 ranges from -55^0 to $+150^0$ Celsius. It provides a proportional resistance, current, or voltage output which is then measured or processed as per our application. It is semi- conductor-based sensor. Motor pump is used to supply water to agricultural field. All these working are controlled by internet through wifi module. All these information will display on web page and through AT mega 16 we will get updates about agricultural field. Owner will type IP address on web browser and receive all the information.

IV.BLOCK DIAGRAM

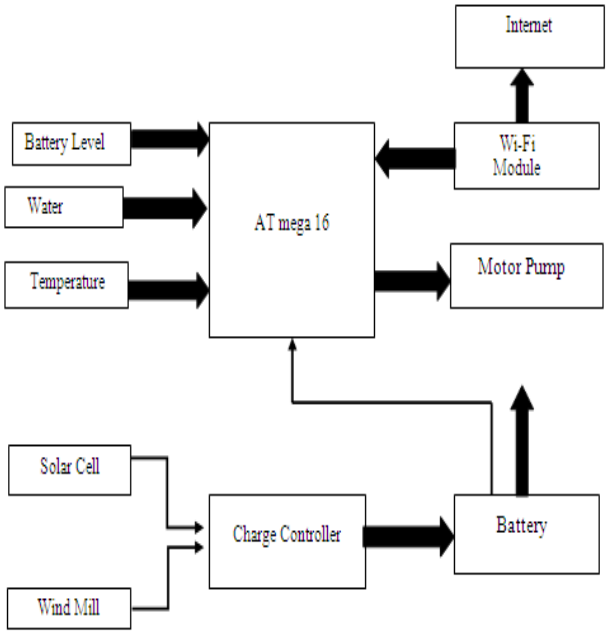

Fig. 2 Block Diagram.

V. ELECTRIC FENCING

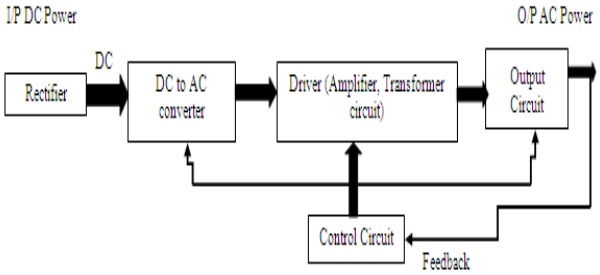

Fig.3 Block Diagram of Electric Fencing.

An additional concept i.e. Electric fencing is added into this project for the protection of agricultural field. Electric fences are used to create an electrical circuit when touched by a person or animal. The energy generated by solar and wind system will be DC so it is converted into AC through inverter or power energizer .Power energizer converts power into a short high voltage pulse. This energy is then stored in battery.

Transformer is used to either raise or lower voltages and currents in circuit. In this, one terminal of power energizer releases an electrical pulse along a connected bare wire about once per second. Another terminal is connected to a metal rod implanted in the earth, called ground or earth rod. A person or animal touching both the wire and the earth , a pulse will complete an electric circuit and will conduct the pulse, causing an electric shock. In this 500V voltage is used with 50mA current i.e. high voltage and low current. This is sufficient that the animal or person will not cause any long term harm.

VI. FLOW CHART

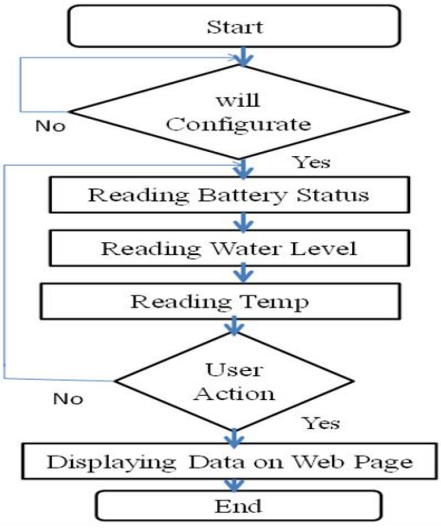

Fig.4 Flow Chart.

VII. ADVANTAGES

- Human efforts gets reduce.
- Power consumption require is less.
- Energy is available throughout the day i.e 24 hrs.
- Wind and solar energy are complementary to each other which makes the system to generate electricity almost throughout the year.

VIII. PROJECT MODEL

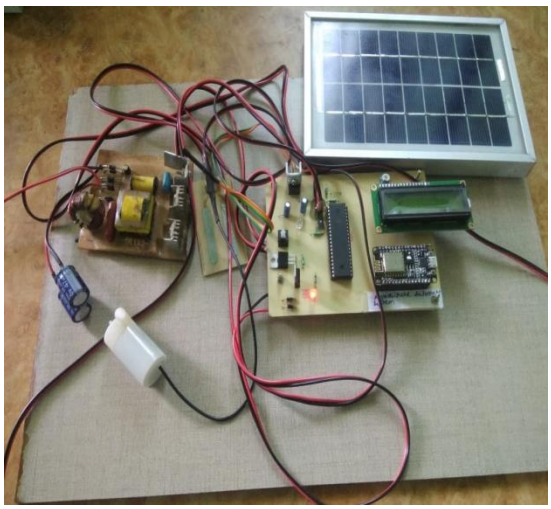

Fig.5 Hardware.

IX. CONCLUSION AND FUTURE WORK

The system will moniter the automation in agricultural field with better efficiency and control the process of irrigation. In these days smart phone usage are very high. They worked as per the values sent by the sensors and it is also controlled via a developed website if there is any depletion of smart phone. The model which is presented in this work is wireless. By using wireless mode, agricultural field can be monitored and secured. Future work would focus on computing the entire system and make automated mechanism in farmland.

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