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KRUSHI RAKSHAK- A New Approach of Protection & Intimations for Agricultural Land

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Abstract: **-- "KRUSHI RAKSHAK'' As the project title says, this project is very useful for farmers. Nowadays farmers in India are facing so many problems because of power cuts and they don't know when the power comes and goes. So with this project, we can solve the problem of the power cut by using the solar energy to run the pump. Using the IOT WIFI technology, the farmer can know when the power comes and goes and using this information he can control the pump wirelessly so he can switch on the pump in power mode or the solar mode so that he can store the solar energy for future use. With the help of the soil moisture indicator, the farmer can know the status of the soil water. With the help of the hi-tech laser security system, the farmer can monitor the farm wirelessly. The timer based switching system for the water pump.**

Keywords: - Microcontroller, Soil moisture Sensor, IoT, Android Application.

I. INTRODUCTION

With countries supply depending on its agriculture and the farming lands going vast, it's difficult to monitor the farms on a day to day basis, even if it's possible the labor would be more. With enhanced technologies and embedded devices we would merge to create a robust device which can control the functions of the irrigation without the availability of a farmer apart from sowing and ploughing the soil. As the project title says, this project is very useful for farmers. Nowadays farmers in India are facing so many problems because of power cuts and they don't know when the power comes and goes. So with this project we can solve the problem of the power cut by using the solar energy to run the pump. Using the IOT WIFI technology, the farmer can know when the power comes and goes and using this information he can control the pump wirelessly so he can switch on the pump in power mode or the solar mode, so that he can store the solar energy for future use. With the help of the soil moisture indicator the farmer can know the statues of the soil water. With the help of the hi-tech laser security system the farmer can monitor the farm wirelessly. Timer based switching system for water pump.

II. RELATED WORK

2.1 Application of the internet of things technology in precision agriculture irrigation systems

Sanbo Li et al presented a paper in the year 2012 (International Conference on Computer Science and Service System) he discusses about his country is one of the scarce water resources in 13 countries in the world, shortage of water resources as well as the low utilization of water resources restricts our country economy developing sustainably. In order to effectively reduce the impact of inadequate water resources on China's economy, from modern agricultural cultivation and management perspective, according to the basic principles of Internet, with wireless sensor technology, this article proposes precision agriculture irrigation systems based on the internet of things (IOT) technology, and focuses on the hardware architecture, network architecture and software process control of the precision irrigation system [5]..

2.2 Real time survey on farmers and farming

Some farmers in our regions like K R Nagara, H.D kote, Holenasipura and Mandya still follows the same old ways of farming and even they completely depend on the rainfall to start harvesting and they refuse to use new techniques of harvesting. Their refuse to use methodology is merely understanding the situation because everyone have the fear of failure and so they have the same and they need proper guidance and help to use new technology in agriculture. Taking bank loans or borrowing money from land lords is same old way to harvest there land by poor farmers. If a person refuses to use different technologies, then that

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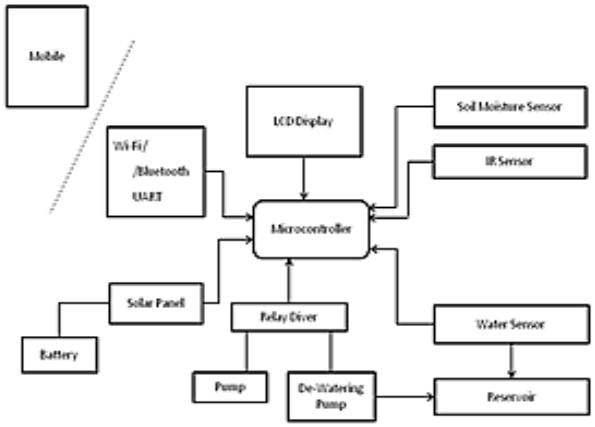
particular race comes in many difficulties. One of the farmers named Krishna from H.D Kote said that they are totally in fear of using new technology of cultivation but also seeking help from someone who guides him in better way to harvest some crops. There are many applications developed to use in mobile phones that reaches the farmer easily and helps them cultivation of crops as well as these application tremendously help them in educating with modernized technology Coronet et al.[1].

III. DESIGN

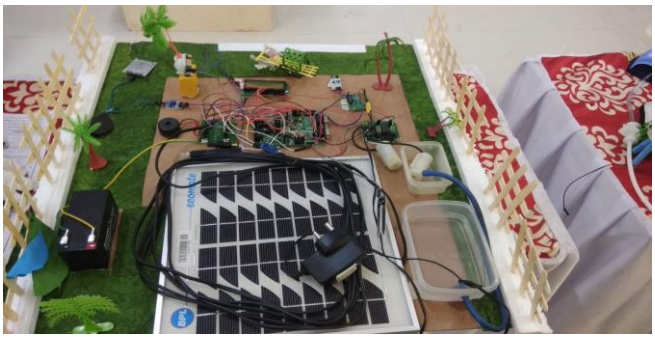
In our system we have modern technologies that have evolved into agricultural stream, one of the technology used in the proposed system is Internet of Things (IoT).An appliance working automatically understanding the situation/conditions and alerting the farmer. Presently the designed sensing systems have syntactic and semantic heterogeneity and face underlying limitations for achieving interoperability among these distributed sensing systems. In this study an attempt has been made to develop modernized farming. A semantically aware web enabled wireless sensing system for precision agriculture applications. Through integration of many sensors on sensing system has enabled the interoperability between different standardized sensing systems. This system acts as interconnection between users with different sensors using GSM technology. The different modules used in our project are Water level module, IR module, Temperature Sensor Module, Soil Moisture Level module and GSM. Where we also use solar panel for Motor to get ON /OFF as a secondary electric supply for our system. These sensors has to be integrated with software, the software used in our proposed systems are Keil µVision4 it is based on Integrated Development environment (IDE). It consists of a code editor, a compiler, a debugger which is used for programming in embedded C and generates Hex code for burning in microcontroller. And software we are using is Flash Magic this software is used for burning the generated Hex file into microcontroller. The Microcontroller for proposed system is ARM (LPC2148) as this controller is suitable for developing applications which require high speed data communication, real time clock for data checking etc. As the instructions are less in ARM, the digital and analog sensors gets very well compatible with our controller compare to other controller.

A. Block Diagram



The above block diagram shows the working of the system. The controller is the main device which controls all the functions in the system. Controller requests the commands to the sensors for further processing. Soil moisture sensor for the water content in the field, the result is used for automatic operation of motor (ON or OFF). IR sensor is used for detection of intruders in the field and notifies using WiFi. Water level sensor is used for the water level measurement in the field. GPS is used for cattle tracking and notifies the location of the cattle to the user. Solar panel is used as the power resource for the system. The functional requirements for a system describe what the system should do. These requirements depend on the type of software being developed, the expected users of the software and the general approach taken by the organization when writing requirements. When expressed as user requirements, the requirements are usually described in a fairly abstract way. However, functional system requirementsdescribe the system function in detail, its inputs and outputs, exceptions, and so on.

IV. WORKING PRINCIPLE & MODEL



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Here we have appliance working automatically understanding the situation/conditions and alerting the farmer. Such that the farmer can take appropriate measures. The system is also having smart code built to water the plants, drain excess water and send communications to the people. Solar photo voltaicity is being widely used in different applications. Despite of various limitations of several energy sources, one of the most appropriate and simplest use of photo voltaicity is water pumping [2]. Solar powered water pumping system is widely used in crop irrigation now days. The major advantage of this water pumping system is storing water when sun is shining thus eliminating the need of batteries. It enhances the simplicity and reduces the overall cost of the system. There are two types of solar power water pumping system. They are battery coupled and direct coupled. Battery coupled water pumping system shown in fig 1(a) consists of PV panels, charge control regulator, batteries, pump controllers, pressure switch, tank and DC water pump. The PV panels charges the batteries, which provide supply to the pump whenever water is needed [3]. In direct coupled pumping system which is shown in fig 1(b), electricity from PV modules is directly sent to the pump which in turn pumps water whenever it is needed. This is designed to pump the water only during day time while battery coupled can pump the water both during day and night[7]. Since in direct coupled water pumping system the amount of pumping is directly dependent on the sunlight hitting the PV panels and the type of the pump, thus due to change in intensity of sunlight during the day the amount of water pumped by the system also changes Here we have appliance working automatically understanding the situation/conditions and alerting the farmer. Such that the farmer can take appropriate measures. The system is also having smart code built to water the plants, drain excess water and send communications to the people.

V. RESULTS

The Advanced irrigation system was tested on a plant. The daily water needed by the plant is approximately 580-770mm and the temperature demand of the soil ranges from 50oC-90oC. In the programming code, the moisture and temperature range were set (which convert the resistance into a digital signal). Moreover the system is very much affordable and very well efficient in reducing water wastage. Automated irrigation system is completely checked. The reliability of the system is checked by running trial on different conditions. The system is successfully capable of watering the plants at the time of need. Controller sense the situation when the soil is dry and operates the pump accordingly after irrigating the field it will turn itself OFF.

VI. COST ANALYSIS

Implementation process of the project can cost around Rs 60 thousand @ min & as a part of implementation process i.e., cost of solar panel & sensors depends upon how much can the owner afford financially, that includes based on size, quantity &quality (Q&Q). This project can be implemented in all types agricultural practices & as well the existing horticultural lands, but in existing agricultural land the important case is providing resources & the process can be implemented to any number of farmlands (present maximum is up to 2 acres of land).

VII. CONCLUSION

At present, labor-saving and water-saving technology is a key issue in irrigation. A wireless solution for intelligent field irrigation system dedicated to planting, based on GSM technology instead of conventional wired connection, the wireless design made the system easy installation and maintenance. The hardware architecture and software algorithm of wireless sensor/actuator node and portable controller are acting as the end device by coordinator in wireless sensor network respectively. So that the controlling of water pump for farmers makes so easy and providing security make it secure. Another important fact of this system is the easy installation of the system where the base station can be placed at the local residence close to the farm and the monitoring task can be done by only that person who has authenticated for it. And the main advantage of solar system is, when the prices of fossil fuels rise and the economic advantages of mass production reduce the peak watt cost of the photovoltaic cell, photovoltaic power will become more cost-competitive and more common. The cost of power and labor will be zero.

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