Automated Drip Irrigation System

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Abstract— Irrigation is the process of artificially supplying water to land where crops are cultivated. Traditionally rainfall, canal water and hand pumps are major sources of water supply for irrigation. Automated irrigation system which automates the irrigation of land by combining various software and hardware for field irrigation. Here WSN issued to monitor the environmental condition, wireless sensor network (WSN) refers to a group of sensors for monitoring and recording the physical conditions of the environments and organizing the collected data at a central location. This paper gives detailed survey of various automated farm irrigation systems. GSM serves as an important part also it is responsible for controlling the irrigation facility and sends them to receiver through coded sigma.

Key words: GSM, WSN, GSM facility plays

I. INTRODUCTION

Irrigation is the process of artificially supplying water to land where crops are cultivated. Traditionally in dry regions having no or little rainfall water so on that time another way to supply water to the land through canal, hand pumps, tube wells. But this methods had lots of problems such as increase in workload of farm labour, leaching of soil lesser yield of crop. Hence there was a need to test the soil condition before supplying water to the fields. This mechanism would reduce workload of labour and helps to maintain the proper soil conditions for improved better crop production. Hence in the advance of technology it was possible to design systems that eliminated the direct involvement of farmer with respect to irrigation of their fields. These systems automated the entire irrigation system by controlling the motors that irrigated the fields.

A GSM based irrigation system has two major technologies, primary being the GSM and secondary is the controller. GSM (Global System for Mobile Communication) is a standard set used to describe protocols for digital cellular networks. This GSM facility plays important role for controlling the irrigation on field and also sending the results to the farmer via. sms, to a mobile device which indirectly controls the entire farm irrigation system.

The controller works as a central unit and its function is to automate the process after it has been initiated by the GSM based device, finally the presents output to the device. This paper contains detailed study of various GSM based farm irrigation approaches. In a day, a Bluetooth module is connected with the controller for simplifying the mobile device complications. In this paper we have study the advantages and disadvantages of various technologies.

To overcome the drawbacks of existing system like high cost, difficult in maintenance and more wired connection, we introduce a new system which will have wireless connection between server and nodes. We introduce a new design of embedded web server making use of GSM network technology in this paper. Compared to the wired link web server system, this system is characterized by having no wires between the web server and terminal nodes.

In proposed system the irrigation will take place only when there will be intense requirement of water. Irrigation system uses valves to turn irrigation ON and OFF. These valves may be easily automated by using controllers. Automating farm or nursery irrigation allows farmers to apply the right amount of water at the right time, regardless of the availability of labour to turn valves on and off

In the existing system farmers have to travel to fields often at odd hours just to switch ON/OFF the motor due to erratic power supply. Existing aids like auto-starters are unreliable and incapable of communicating the operating state of the motor, to the farmer, especially when a farmer has more than one motor pump set; he has to run around to make sure that all the motor pumps are working when the power is available.

At times, motor pumps are left running for longer than what is necessary because of the effort involved in switching OFF the motor. This leads to wastage of both electricity and water. Hence our system is overcome this problem. Also this system is very useful because reduce wastage of water, reduce the human effort and reduce the time.

A. Working:

To keep water conservation move, we can move forward with drip irrigation. It is also named as micro irrigation or trickle irrigation. It is an efficient technique which is primarily used in hot tropical conditions. It conserves water and fertilizer .It allow water to drip slowly to the root of plants through valves, pipes, tubing etc. It is done with the help of narrow .It is done with the help of narrow tubes which delivers water directly to the base of the plant. A study of land topography, soil, water conservation is needed to determine most suitable drip irrigation system. The major disadvantage in surface irrigation was it results to water logging, if there is not proper drainage due to which crop gets flourished hence productivity gets affected. But in this we are providing water as requirement of drop therefore there is no problem of overwatering.

In this system whenever the prescribed humidity or water level of soil decreasing below prescribed threshold level. For this purpose we use a humidity sensor and water level sensor. If the level of water increased above the prescribed level during rain, our system automatically lets the extra power and recycles them back to the water tank. This system also senses the speed of wind to predict storm and natural calamities and warns to the farmer by sending SMS using a GSM modem.
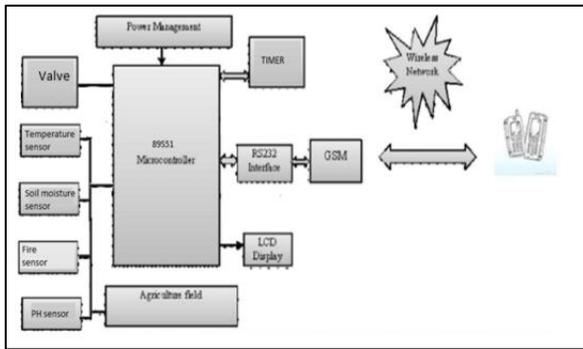
Fig. 1.1: Block Diagram

The temperature and fire sensors are used to alert the farmer on any kind of eventualities for safety purpose. The prescribed level of water varies depending on different crops and nature of the soil, here directly feed the type of soil & automatically set the water level. The farmer easily control and monitor the field using PC through the system is shown in figure4. From figure the system includes GSM, microcontroller etc. The GSM is most popular standard for mobile phone. A unique feature of GSM is the short message service (SMS). The GSM travels across greater distances and handles many sensors. Here 8051 microcontroller is used to control the irrigation using wireless sensor network. A sensor is a device that measures physical quantity and converts it into electrical signal. For example humidity sensor, temperature sensor, water level sensor etc.

B. Construction And Working:

There are three modes of operation:-
1) Humidity Mode:
The humidity sensor checks the moisture content in the farm and accordingly provides the water required for the crops.
2) Automatic Mode:
The timer is set and the motor turns ON/OFF automatically for a certain amount of time.
3) Manual Mode:
The farmer has to press ON/OFF for the working of the motor
4) Sensor:
In this project we use different type of sensor like soil moisture, temperature/fire sensor, ph-sensor, humidity sensor. Controller receive data according to sensor

Controller works as a central unit and its function is to automate the process after it has been initiated by the GSM based device, finally the presents output to the device. GSM (Global System for Mobile Communication): A GSM based irrigation system has two major technologies, primary being the GSM and secondary is the controller.

GSM is a standard set used to describe protocols for digital cellular networks. This GSM facility plays important role for controlling the irrigation on field and also sending the results to the farmer via. sms, to a mobile device which indirectly controls the entire farm irrigation system.
5) Display:
whatever data receive by controller it's displayed on display.

II. CONCLUSIONS

In types of irrigation systems based on GSM. These systems were all remotely controlled systems which proposed a low cost information exchange via SMS and GSM. The result of the survey conducted has lead to a very positive approach on the impact of GSM technology in farm irrigation methods & techniques. Everyday new techniques have been implemented for minimizing the irrigation process like mobile phone and other software application for conduction of irrigation pro software application for conduction of irrigation process. This leads to a better and more efficient agricultural development for the future generations to come.

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