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IOT BASED AGRICULTURAL ENVIRONMENT MONITORING SYSTEM

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Abstract- The impartial of the package is IOT based agricultural environment monitoring system using arduino. India is the crop growing based country. Our olden people totally depended on the agricultural reaping. Agriculture is a cause of living of mainstream Indians and has great control on the economy of the country. In dry areas or in case of insufficient rainfall, irrigation becomes problematic. So, it needs to be automatic for proper harvest and controlled remotely for farmer safety. Increasing energy costs and decreasing water supplies point out the need for healthier water management. Irrigation management is a hard decision making progression to control when and how much water to relate to a growing crop to meet exact management objectives. If the farmer is far away from the agricultural land he will not be noticed of current environments. So, efficient water organization plays an important role in the irrigated agricultural harvesting systems. A low cost alternative solution for efficient water monitoring currently in use is drip irrigation systems that consist of an programmed processor to turn on & off the control values, which in turn helps the farmers by management the water supply to the crop fields and supplementary keeps the humidity levels of soil that helps in better crop production. This project probes into the design of the mindless irrigation system based on Arduino and IoT technology. This Embedded project is to design and develop a low cost feature which is based on embedded stage for water irrigation system. This project uses temperature and soil moisture sensors to detect the water quantity present in agriculture. The project uses Arduino board that processes the information and acts according to the data. The aim of the implementation was to demonstrate that the automatic irrigation can be used to reduce water use.
Keywords- water-saving irrigation, wireless device, efficiency, energy, time saving

I. INTRODUCTION

India is mostly an agricultural country, and all its possessions depend on the agricultural output. Even in the modern span of economic growth, agriculture is the key area that resolves the economic development of the country. The agriculture also versions for 8.56% of the country's total professions. Agriculture is the most important field as paralleled to others in India. The revolutionary water level is gradually falling down and as well as rainfall is also reduced due to deforestation. In order to get the extreme yield in agricultural process, it is necessary to supply the peak quantity of water, and it should be supplied periodically. This is achieved only through a logical irrigation system. Irrigation is the science of forecasting and designing an efficient, low-cost, marketable irrigation system designed in such a way to fit natural conditions.

II. LITERATURE SURVEY

In George Mois, "Analysis of Three IoT-Based Wireless Sensors for Environmental Monitoring". The recent changes in climate have increased the importance environmental monitoring; making it a topical and highly active research area. This field is based on remote sensing. The IoT growth has changed various aspects of modern life. For IoT users, smart Agricultural systems have satisfied the needs of yield management and energy efficiency in external environments and have provided visions of self-managed exercise and further services through Program Maximum of such embedded structures are also considered as real time organisms, which mean that the real-time properties such as response time, worse case execution time, etc., are important design concerns. These

organizations regularly need chance harsh terms for safety, consistency, disposal and other features of dependability. Due to small size and foods for mobility, but also really low congress costs these systems require small and precise resource drinking, and have limited hardware aptitude. The increased thickness of fixed real-time systems leads to growing demands with respect to supplies engineering, top design, early fault revealing, yield, mixing, proof and keep, which increases the importance of an proficient running of life-cycle properties such as maintainability, portability, and ductility and on wireless sensor networks for gathering data about the environment. Recent advancements, such as the vision of the Internet of Things (IoT), the cloud computing model, and cyber-physical systems, provide support for the transmission and management of huge amounts of data regarding the trends observed in environmental parameters. In this context, the current work presents three different IoT-based wireless sensors for environmental and ambient monitoring: one employing User Datagram Protocol (UDP)-based Wi-Fi communication, one communicating through Wi-Fi and Hypertext Transfer Protocol (HTTP), and a third one using Bluetooth Smart. All of the presented systems provide the possibility of recording data at remote locations and of visualizing them from every device with an Internet connection, enabling the monitoring of geographically large areas. The development details of these systems are described, along with the major differences and similarities between them. The feasibility of the three developed systems for implementing monitoring applications, taking into account their energy autonomy, ease of use, solution complexity, and Internet connectivity facility, was analyzed, and revealed that they make good candidates for IoT-based solutions [1].

In Veena Divya,k, AyushAkhouri "A Real time implementation of a GSM based Automated Irrigation Control System using drip Irrigation Methology" deal GSM based Irrigation Control System, which could give the facilities of maintaining uniform environmental conditions. For this, a software stack called Android is used for mobile devices that include an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. Mobile phones have almost become an integral part of us serving multiple needs of humans. This application makes use of the GPRS feature of mobile phone as a solution for irrigation control system. This system covered lower range of agriculture land and not economically [2].

In Man sour "Impact The Automatic Control Of Closed Circuits Rain gun Irrigation System On Yellow Corn Growth And Yield" this research paper deals of automatic control of closed circuits drip irrigation system as a modified irrigation system on yellow corn crop vegetative and yield parameters under (KSA) Saudi Arabia conditions at Al-Hasa region. The field experiment carried out under automatic irrigation system for three irrigation lateral lines 40, 60, 80 m under the following three drip irrigation circuits (DIC) of: a) one manifold for lateral lines or closed circuits with one manifold of drip irrigation system (CM1DIS); b) closed circuits with two manifolds for lateral lines (CM2DIS), order to compensate for ETc and salt leaching requirement. and take more power [3].

In M. Guerbaoui ,elafou,a.ed-dahhak " GSM based automated drip irrigation system " we proposed a system contribution to the development of greenhouse production in Morocco. The proposed solution involves the development of an integrated system for automate the drip fertilizing irrigation in green house. The solution adopted involves a data acquisition card PCL-812PG controlled by PC. The irrigation is provided by a hydraulic circuit based on an electric pump. Water needs are evaluated by measuring soil water status by soil humidity sensor [4].

In Purnima, S.R.N Reddy, "Design of Remote Monitoring and Control System with Automatic Irrigation System using GSM-Bluetooth", proposed artificially supplying water to land where crops are cultivated. Traditionally hand pumps, canal water and rainfall were a major source of water supply for irrigation. This method has led to severe drawbacks like under irrigation, over-irrigation which in turn causes leaching and loss of nutrient content of soil. Changing environmental conditions and shortage of water have led to the need for a system which efficiently manages irrigation of fields. Automated irrigation system is a machine based system which automates the irrigation of land by combining various software and hardware approaches together for field irrigation. This paper deals with a detailed survey of various GSM based automated farm irrigation systems. GSM serves as an important part since it is responsible for controlling the irrigation facility and sends them to receiver through coded signal. Our

study is concentrated on comparison of various GSM approaches [5].

Jin Li :Dept. of Electronics and Information Engineering Huazhong University of Science and Technology, "Filter Design and Optimizing based on a Neural Network" To improve irrigation water use efficiency, reduce cost of irrigation water, this paper discussed the design of wireless sensor network and Internet technology of farmland automatic irrigation control method. Emphasis on an analysis of the routing protocol of sensor network nodes to achieve the system hardware and software design, middleware, and applications such as mobile phone or wireless PDA of internet of things, will constitute a variety of sensors intelligent network, thus enhancing the overall automation system and monitoring levels. The final analysis of the network in the Internet based on the agricultural plants of farmland water-saving irrigation system integrated approach. User use mobile phones or wireless PDA can easily soil moisture content of online monitoring and control to realize the irrigation automation. As a new internet of things information network , for most types of agricultural materials, agricultural products through the Internet of Things will be fresh growth state, response to environmental changes, storage preservation, distribution and quality and safety of equipment, machinery, With the development of internet of things, its technology has been widely applied to all aspects of agricultural production, water-saving irrigation involves engineering, agriculture, biology, automation, communications, and many other technologies. water-saving irrigation automatic control system based on wireless sensor using the sensor and set the conditions and the receiver communication, control irrigation systems, valves open, close, so as to achieve the purpose of automatic water-saving irrigation [6].

In Joaquín Gutiérrez, "Automated Irrigation System Using a Wireless Sensor Network and GPRS Module", An automated irrigation system was developed to optimize water use for agricultural crops. The system has a Distributed wireless network of soil-moisture and temperature sensors placed in the root zone of the plants. In addition, a gateway unit handles sensor information, triggers actuators, and transmits data to a web application. An algorithm was developed with threshold values of temperature and soil moisture that was programmed into a microcontroller-based gateway to control water quantity. The system was powered by photo voltaic panels and had a duplex communication link based on a cellular-Internet interface that allowed for data inspection and irrigation scheduling to be programmed through a web page. The automated system was tested in a sage crop field for 136 days and water savings of up to 90% compared with traditional irrigation practices of the agricultural zone were achieved. Three replicas of the automated system have been used successfully in other places for 18 months. Because of its energy autonomy and low cost, the system has the potential to be useful in water limited geographically isolated areas[7].

In Nick Harris, Andy Cranny, "Application of Distributed Wireless Chloride Sensors to environmental Monitoring: Initial Results", Over the next 30 years, it is anticipated that the world will need to source 70% more food to provide for the growing population, and it is likely that a significant amount of this will have to come from irrigated land. However, the quality of irrigation water is also important, and measuring the quality of this water will allow management decisions to be made. Soil salinity is an important parameter in crop yield, and in this paper, we describe a chloride sensor system based on a low-cost robust screen-printed chloride ion sensor, suitable for use in distributed sensor networks. Previously, this sensor has been used in controlled laboratory-based experiments, but here we provide evidence that the sensor will find application outside of the laboratory in field deployments. We report on three experiments using this sensor; one with a soil column, one using afluvarium, and finally on an experiment in a greenhouse. All these give an insight into the movement of chloride over small distances with high temporal resolution. These initial experiments illustrate that the new sensors are viable and usable with relatively simple electronics, and although subject to ongoing development, they are currently capable of providing new scientific data at high spatial and temporal resolutions. Therefore, we conclude that such chloride sensors, coupled with a distributed wireless network, offer a new paradigm in hydrological monitoring and will enable new applications, such as irrigation using mixtures of potable and brackish water, with significant cost and resource saving [8].

a. SYSTEM ARCHITECTURE

The insecticide quantity decrease is lectured by capitals of an pioneering mishmash of the wireless sensor system. The future solution introduces the approximation of the latitudinal supply of the optimum dosage. The devotion to the environmental sustainability of agriculture and to the bargain of insecticide use for organic tilling is rapidly increasing. However, the adeptness limits of the mass making require the minimization of yield losses due to impurities. New disease control tactics are required to find the best trade-off between commercial and ecological aspects.

A minor prototype is designed which consist of some plants linked to a multi sensor. Multi sensor is a grouping of temperature sensor, humidity sensor, motion sensor, light sensor, vibrating sensor and UV sensor. An logical scheme which roles to study a example for the company of a definite multiple is known as sensor. The humidity and pH value spotted by the multi sensor is taken by interfacing arduino which is permitted to the planters mobile using GSM.GSM (Global System for Mobile communication) is a digital mobile telephony system that is broadly used in all parts of the world. GSM uses a inequality of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony machineries (TDMA, GSM, and CDMA).By noticing the level of pesticide we can accordingly reduce its measure.

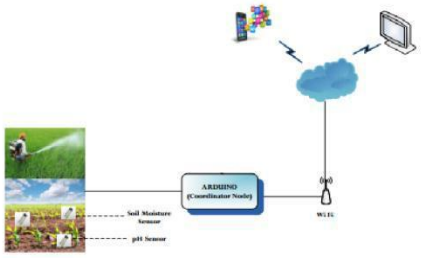

Figure 1: System Architecture

III. PROPOSED WORK

The block diagram of the proposed system consists of identifying unit such as Soil Moisture Sensor to ration water gratified of soil

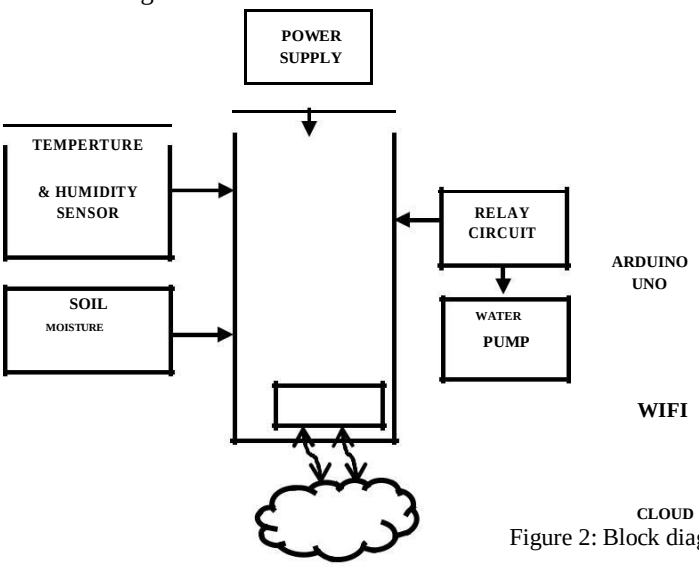

Figure 2: Block diagram

Arduino uno -An exposed source podium which involves of both a physical programming circuit board (Micro controller) and a piece of software (Integrated development Environment).

Soil Moisture Sensor - The Soil Moisture Sensor(SMS) is a sensor linked to an irrigation system director that measures soil moisture contented in the active root zone before each scheduled irrigation event and bypasses the cycle if moistness is above a user defined set point.

Relay - Switches that open and close circuits electronically and electro magnetically. Control one electrical circuit by opening and closing contacts in another circuit.

Temperature sensor& humidity sensor-ThisDHT11Temperature and Humidity Sensor features a calibrated digital signal output with the temperature and humidity sensor complex. Its technology ensures the high reliability and excellent long-term stability. A high-performance 8-bit microcontroller is connected. This sensor includes a resistive element and a sense of wet NTC temperature measuring devices. It has excellent quality, fast response, anti-interference ability and high cost performance advantages.

a. CONCLUSION

The proposed controller eliminates the on-place switching mechanism used by the farmers to ON/OFF the irrigation system. Integrating features of all the hardware components used have been developed in it. Occurrence of each module has been logical out and located prudently, thus donating to the best working of the unit. Next, using highly advanced IC's with the help of rising technology, the project has been really employed. The microcomputer irrigation system applied was found to be feasible and cost actual for changing water resource for agricultural manufacture. This irrigation system allows cultivation in places with water insufficiency thereby improving sustainability. The micro irrigation system progressive proves that the use of water can be weakened for a given amount of fresh biomass manufacture.

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