Arduino Based Smart Irrigation System

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Abstract: India is the crop growing based country. Our ancient publics entirely depended on the farming realizing. Agriculture is a cause of living of mainstream Indians and has great control on the economy of the country. In dry zones or in situation of lacking rainfall, irrigation comes to be difficult. So, it wants to be involuntary for correct produce and measured at all for farmer protection. 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, capable aquatic association plays a vital role in the irrigated agricultural harvesting structures. A small cost another key for well-organized aquatic checking presently in use is drip irrigation structures that contain of an automatic 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 development is to intention and growth a low cost feature which is established on inserted stage for aquatic irrigation system. This mission uses temperature and soil moisture sensors to sense the water amount present in farming. The project uses Arduino board that process the information and acts according to the data. The goal of the operation was to prove that the programmed irrigation can be used to decrease aquatic use.

Keywords: Water-saving irrigation, wireless device, efficiency, energy, time saving.

I.INTRODUCTION

India is normally a cultivated republic, and all its belongings depend on the agricultural harvest. Even in the modern span of economic growth, agriculture is the key area that resolves the economic development of the country. 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 knowledge of estimating and planning a well-organized, low-cost, profitable irrigation system intended in such a method to fit normal situations. 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.

II. LITERATURE SURVEY

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 [1].

In **Mansour "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 [2].

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 [3].

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 [4].

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 [5].

III. 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 device is a group of temperature sensor, humidity sensor, motion sensor, light sensor, vibrating sensor and UV sensor. A logical scheme which roles to study an 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 alphanumeric mobile telephony organisation that is mostly used in all parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) and is the maximum extensively used of the three digital wireless telephony machines (TDMA, GSM, and CDMA).By observing the level of insecticide we can hence decrease its ration.
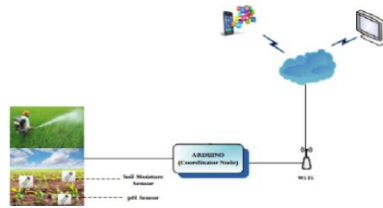
Figure 1: System Architecture

IV. PROPOSED WORK

The block diagram of the proposed system contains of detecting component such as Soil Moisture Sensor to ration water gratified of soil
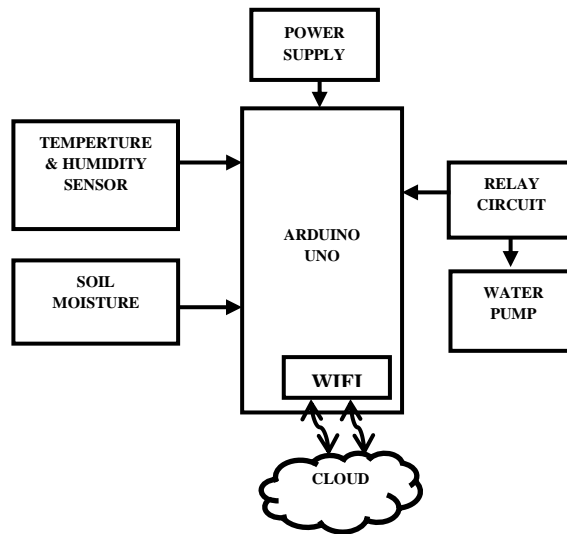

Figure 2: Block diagram

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 energetic root zone previously each planned irrigation event and bypasses the cycle if humidity is above a user defined set point.

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

Temperature sensor& humidity sensor-This DHT11 Temperature and Humidity Sensor structures a regulated digital signal output with the temperature and humidity sensor difficult. Its knowhow ensures the high consistency and excellent long-term constancy. A high-performance 8-bit microcontroller is linked. This sensor contains a resistive element and a sense of wet NTC temperature measuring devices. It has outstanding feature, fast response, anti-interference ability and high cost performance compensations.

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 permits cultivation in places with aquatic insufficiency thereby cultivating 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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