Development of Effective Water Management System (EWMS) with Multipath Controlling Support

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ABSTRACT:

India is the agriculture based country. Our ancient people completely depended on the agricultural harvesting. Agriculture is a source of livelihood of majority Indians and has great impact on the economy of the country. In dry areas or in case of inadequate rainfall, irrigation becomes difficult. So, it needs to be automated for proper yield and handled remotely for farmer safety. Increasing energy costs and decreasing water supplies point out the need for better water management. So its mandatory to seeking for alternatives to the development of high-yielding crops with drought tolerance is necessary to increase food, feed, fiber and fuel production. Methods that create similar environmental conditions for a large number of genotypes are essential to investigate plant responses to drought in gene discovery studies. Modern facilities that control water availability for each plant remain cost-prohibited to some sections of the research community. We present an alternative cost-effective automated irrigation system scalable for a high-throughput and controlled dry down treatment of plants. To consider all these issues we are going to Design and Implement an intelligent soil moisture control system to support agricultural field. This project probes into the design of the automated irrigation system based on Arduino controller. This Embedded project is to design and develop a low cost feature which is based on embedded platform for water irrigation system. This project uses temperature and soil moisture sensors to detect the water quantity present in agriculture. The project uses Arduino micro controller which is controller to process the information. The aim of our embedded project is to monitor status of the sensors on remote PC through a web page. The system has a Distributed wireless network of temperature and soil moisture sensors can be monitored on web page through Arduino controller.

Keywords: Effective Water Management System (EWMS), Multipath Operating Assistance, Internet of things(IoT), GPRS and Agricultural field.

1. INTRODUCTION

The contribution of agriculture plays an important role in the economic growth of India. In India, more than 60% of peoples depend upon agriculture. This 60 % of people produce food for the country. Recently, the number of farmers in India decreasing day by day. The agriculture results depend up on the various controlled and uncontrolled factors like sudden change

in climatic conditions; high and low rain fall and also the timing of the rain, storms and heat waves, and effects of cold, etc. For these conditions, traditional farming techniques are not appropriate. To minimize these effects and increase the productivity of agriculture, automation and IoT techniques are required.

Figure 1: Fully Automated Irrigation System.

By the help of Automation and IoT, we can measure the environmental condition and water management because these are the most important factors in agriculture. India's record of progress in agriculture over the past four decades has been quite impressive. The agriculture sector has been successful in keeping pace with rising demand for food. The contribution of increased land area under agricultural production has declined over time and increases in production in the past two decades have been almost entirely due to increased productivity. Contribution of agricultural growth to overall progress has been widespread. Increased productivity

has helped to feed the poor, enhanced farm income and provided opportunities for both direct and indirect employment. The success of India's agriculture is attributed to a series of steps that led to availability of farm technologies which brought about dramatic increases in productivity in 70s and 80s often described as the Green Revolution era 1]. The major sources of agricultural growth during this period were the spread of modern crop varieties, intensification of input use and investments leading to expansion in the irrigated area. In areas where 'Green Revolution' technologies had major impact, growth has now slowed. New technologies are needed to push out yield frontiers, utilize inputs more efficiently and diversify to more sustainable and higher value cropping patterns". At the same time there is urgency to better exploit potential of rain fed and other less endowed areas if we are to meet targets of agricultural growth and poverty alleviation. Given the wide range of agro ecological setting and producers, Indian agriculture is faced with a great diversity of needs, opportunities and prospects. Future growth needs to be more rapid, more widely distributed and better targeted. These challenges have profound implications for the way farmers' problems are conceived, researched and transferred to the farmers. "On the one hand agricultural research will increasingly be required to address location specific problems facing the communities on the other the systems will have to position themselves in an increasingly competitive environment to generate and adopt cutting edge technologies to bear upon the solutions facing a vast majority of resource poor

farmers". The robotic systems play an immense role in all sections of societies, organization and industrial units. The objective of the project is to develop a microcontroller based system that helps in on-farm operations like seeding and fertilizing at pre-designated distance and depths with all applicable.The Agriculture Parameters are utilizing an IOT Technology and system availability that draw in these objects to assemble and deal information. "The IOT enables things selected recognized or potentially forced remotely crosswise over completed the process of existing configuration, manufacture open gateways for all the additional obvious merge of the substantial earth into PC based frameworks, in addition to acknowledging overhauled capacity, precision and cash interconnected favoured stance. Precisely when IOT is extended with sensors and actuators, the improvement modify into an occasion of the all the extra wide category of electronic physical structures, which in like manner incorporates headways, for instance, clever grids, splendid homes, canny moving and smart urban groups [1]. All is especially specific through its introduced figuring configuration anyway can interoperate within the current Internet establishment.

2. RELATED STUDY

Horticulture is the foundation of our Nation. In long time past days agriculturists used to figure the ripeness of soil and influenced presumptions to develop which to kind of product. They didn't think about the dampness, level of water and especially climate condition which horrible an agriculturist more. They utilize pesticides in view of a few suspicions which made lead a genuine impact to the yield if the supposition isn't right .The profitability relies upon the last phase of the harvest on which agriculturist depends.

The global population is increasing in an unexpected rate; its direct impact is the pressure on the agricultural sector. In other words, the demand for food is growing day by day, so innovation in the agricultural sector is one of the most important duties of the Engineers today. In this project, an ARM based Automatic Irrigation System backed up by cloud/server has been developed that serves two major purposes. Firstly, it reduces the manpower needed in the fields as the water supply will be automatic. This also indicates one farmer can now take care of one or more crop, which ultimately leads to an increase in yield. with the automation of water supply, crops get the exact amount of water needed considering all the factors like its breed, the season, moisture retentivity and various other factors. We expect an increase in the crop quality with the advent of this technology. This project probes into the design of the automated irrigation system based on ARM controller. This Embedded project is to design and develop a low cost feature which is based on embedded platform for water irrigation system. This project uses temperature and soil moisture sensors to detect the water quantity present in agriculture. The project uses ARM micro controller which is controller to process the information. The

aim of our embedded project is to monitor status of the sensors on remote PC through a web page. The system has a Distributed wireless network of temperature and soil moisture sensors can be monitored on web page through Arm controller. In addition, a gateway unit handles sensor information, triggers actuators, and transmits data to a web application. The web-servers connected to Internet. The system was powered by photovoltaic 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 owner on the PC is also connected to same Internet. By typing the IP-address on the web browser, the owner gets a web page on screen.

Figure 2. Proposed Model.

This page contains all the information about the status of the sensors or else the owner can also monitor the results through mobile if the mobile has internet facility. Because of its energy autonomy and low cost, the system has the potential to be useful in water limited geographically isolated areas. In the twenty first century, there is revolution of the sensor networks which have also come up with various applications like surveillance, traffic control, environmental and wildlife monitoring, agricultural application, home automation and industrial process control .Embedded Controlled sensor networks (ECSN) are mainly designed to be application- specific so that the energy consumption is minimum as the battery-powered nodes demand life-time of several months or even a few years. The architecture of a typical embedded controlled sensor network is shown in Figure.

3. PROPOSED SYSTEM

To improve the efficiency of the product there by supporting both rancher and country we need to utilize the innovation which appraises the nature of harvest and giving recommendations. The Internet of things (IOT) is revamping the agribusiness engaging the farmers by the broad assortment of techniques, for instance, accuracy and conservative cultivation to go up against challenges in the field. IOT advancement aids in social affair information on conditions like atmosphere, temperature and productivity of soil, harvest web watching engages area of weed, level of water, bug acknowledgment, animal interference in to the field, alter improvement, cultivation. IOT utilize farmers to get related with his residence from wherever and at whatever point.
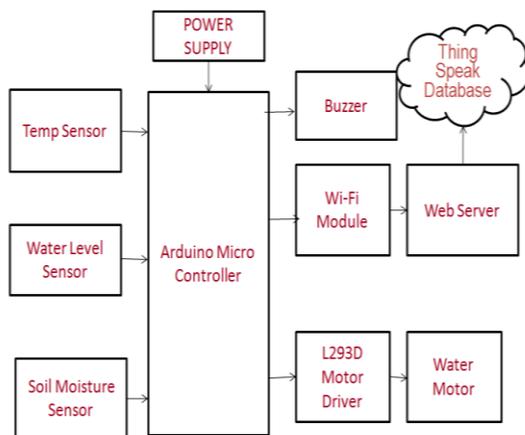
Remote sensor frameworks are used for checking the farm conditions and little scale controllers are used to control and robotize the property shapes [2]. In this paper a Precision Agriculture has the advantage of giving continuous criticism on various distinctive yield and site factors. As its name suggests, Precision Agriculture is exact in both the extent of the product territory it screens and in addition in the conveyance measures of water, compost, and so forth. This innovation can separate a solitary plant for checking in the tens or several square feet. The WSN framework requires a brought together control unit with UI. Exactness Agriculture requires a novel programming model for each land territory, the characteristic soil write and the specific harvest or plants. For instance, every area will get its own particular ideal measure of water, compost and pesticide. It's by and large prescribed that information gathering be done on a hourly premise. Visit information gathering doesn't give extra helpful data to the product show and turns into a weight to the Wireless Sensor Network as far as power utilization and information transmission. Less continuous observing might be satisfactory for certain moderate development harvests and regions that have extremely steady, uniform atmosphere conditions.

4. OPERATION WITH RESULTS

Some wise scientist once said that control system is a system where we can shut down the machine whenever we want. That's the difference between controlled and uncontrolled machine. Our project is about make this control system efficient and dynamic. As the name suggested the automatic control is for controlling the motor from remote place, look over its operating conditions, get feedback from the motor itself. Our target is to control the motor from distant place by mobile Signal tone and also get feedback by SMS while it is in ON or OFF condition. We also ensure the safe operation of the motor by detecting the voltage of the source and ensure feedback from system while it is over or under voltage. Again we also get these feedbacks by SMS as well. GSM network is everywhere in our country that's why we choose GSM network to operate our motor also transferring feedback information through it. We also use GSM network because if we use it then we don't need to establish extra equipment for networking. To transmit feedback signals we use GSM modem at the motor end also generate control signal by mobile because it is very easy to generate GSM by mobile station and send feedback SMS by Modem as well. In industrial sector we hope our project is become handy and cost effective to operate motor and give its protection.
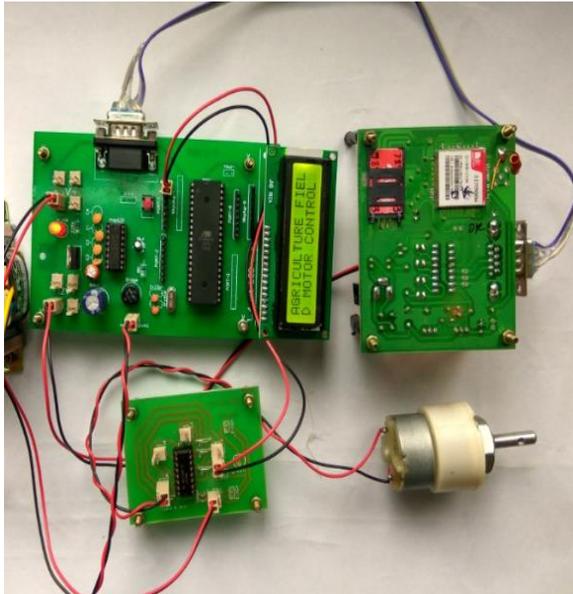
Figure 3: Hardware kit.

The automated irrigation system hereby reported, consisted of two components wireless sensor units and a wireless information unit , linked by radio transceivers that allowed the transfer of soil moisture and temperature data, implementing a WSN technology. The server via the public mobile network. The information can be remotely monitored online through a graphical application through Internet access devices.

The traditional farming process based up on humans. From the starting of the farming process to end process needs the human-like Ploughing, Spray seeds, Fertilizer, check the water level and availability and Harvesting. In smart farming, sensors are applied for gathering the data from various filed like temperature sensor, Humidity sensor, Soil moisture sensor, Think to speak IoT app, Water motor, and sprinklers. These sensors are

well connected with the microcontroller. Microcontroller received the data from the sensors and checks the threshold values. Then according to the threshold values, it takes the needful action and also informed the farmer by the message. The all the process completed by the GSM module. Nowadays, the culture of the poly house increasing day by day because in the poly house setup we can control the temperature, humidity, pest attack, and irrigation process. By smart farming, we can also minimize the human efforts to maximize productivity.
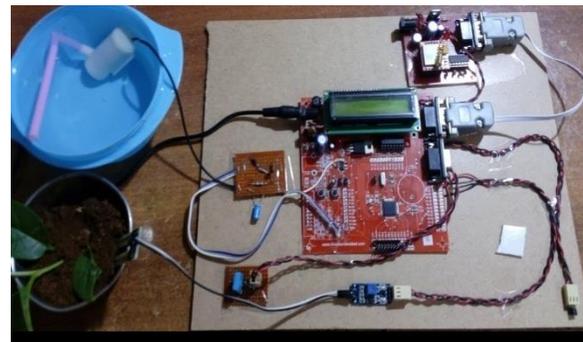

Figure 4: Output Results.

5. CONCLUSION

Three commercial sensors had been integrated with the system to monitor and compute the level of existence of Water level, temperature and humidity in atmosphere using information and communication technologies. The benefits of using an IoT (Internet of things) based system have been realized in here. The IoT based system provides a scope of data storage which provides a further chance of analyzing the data. This provides a chance of comparative study of data available from different zones, analyzing them and thus

provides a scope of experimentation and finding solution for abnormal behavior of a same crop grown in different regions. This system has been developed in such way which eases the user end complexity making it more approachable for the common people. The fault due to delay transmission has been tried to reduce by introducing high rate of packet delivery and reduction of data loss. The system can be further improved by incorporating new self-learning techniques in the cloud to increase the self-dependency of the system and its perimeter of taking autonomous decisions. In previous paper they controlled Devices like motor and anther devises by using Switches. But here we are controlling all devices automatically depending on sensors data. In previous project they are using Relys for the devices on off Here we are using triacs for the devices on off. In this project we are using Arduino controller as a master microcontroller for automatic irrigation and effective water management.

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