SMART IRRIGATION SYSTEM USING IOTFOR FARMERS

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Abstract: In India, Agriculture is a source of income for majority people and has a large impact on the economy of the country. Suitable conditions and suitable moisture in soil or land can play a major role for agricultural production. Mostly traditional method is used for irrigation. Such supply of water may leave varied moisture levels in filed. The management of the water system can be enhanced utilizing automated watering system. This paper proposes a smart irrigation system which will reduce manual labour and optimizing water usage. Also system will send live video to check whether his irrigation system is working as per requirement or not.For formulating the setup, Arduino kit can be used with moisture and camera sensor with Wi-Fi module. Our experimental setup will connected with cloud framework and data collection is done. Then data is analysed by system and suitable recommendations will be given to user.

IndexTerms: **Internet of Things (IoT),Sensors, Arduino, Irrigation system**

I. INTRODUCTION

Currently traditional method used for irrigation is manual. That means farmer or worker working in farm or garden manually checks whether water supply is necessary for part of farm or not and start providing water by using one of the irrigation method. Smart irrigation system will automatically give alert on farmer's mobile about soil conditions in his farm or part of farm and necessity of water in the farm or garden. By pressing single button farmer can start water supply by starting his irrigation system.

In India majority farmers are using traditional manual method of irrigation or water supply. This result in increased man power at farm as well as it is very time consuming process. Instead of this if farmer is using smart irrigation system his efforts and time consumption will get reduced.

In recent years different researchers are working in different countries in the field of IoT for Smart irrigation system. But no system is available with provision to test whether pump has started, whether our irrigation or sprinkling system has started or not. At present in our country smart irrigation system is present but our farmer is not used to it. In present smart irrigation system there is provision to start and stop irrigation system from far away from farm but there is no provision to test whether pump has started, whether our irrigation or sprinkling system has started or not. In our country in rural India almost all the population is dependent on farming. Smart irrigation system will reduce human physical efforts with minimum risk. As human efforts are reduced efficiency of working will increase.

II. LITERATURE REVIEW:

There has been many research works going on the motivation of computerization of water system frameworks. Different innovations have been utilized to achieve assortment of ends. Different researchers have worked with customized water sprinkling or water framework system. They picked unmistakable estimations for choosing the dirt condition and measure of water. They similarly analyzed about different wellsprings of vitality for the sensors. Furthermore, the development for making framework among the sensors and blueprint of control system were moreover seriously discussed by the specialists.

Dweepayan Mishra, Arzeena Khan, et.al. proposed Automated Irrigation system with IoT based approach. In this system authors used Soil Moisture Sensor to sense soil moisture and accordingly manage water supply to farm. [1]

Vaishali S, Suraj S, Vignesh G, Dhivya S and Udhayakumar S proposed Mobile Integrated Smart Irrigation Managementand Monitoring System. The system consists of different sensors such as Soil moisture sensor, temperature sensor. DC motor based vehicle is designed for Irrigation purpose. Automatically water supply will start and stopped by system and the same will be communicated to user via message on mobile.[2]

Prateek Jain, Prakash Kumar, D.K. Palwalia proposed System consists of soil moisture sensor for obtaining soil moisture level, arduino micro-controller interface unit and database with local environmental conditions & crop data. Moisture sensor distinguishes the humidity dimension of soil. Soil dampness and temperature foreordained range is set especially for explicit plants necessity, and as per that framework is being worked. Engine stack incorporates water siphons and included adornments for providing water to plants. Atmega328 Microcontroller computerizes water cycle dependent on data gathered from temperature and moisture sensor. [3]

Dr. M.MAHALAKSHMI, S.PRIYANKA, Dr.S.P.RAJARAM, R.RAJAPRIYA implemented Distant Monitoring and Controlling of Solar Driven Irrigation System through IoT. The system uses various sensors namely soil sensor, humidity sensor and water sensor. Soil sensor used to detect moisture content in soil, water sensor used to measure water level in tank and humidity sensor is used to measure humidity and temperature of surrounding air. [4]

III. PROPOSED SYSTEM:

Proposed a methodology will be smart system by using IoT by using sensors to sense need of water to soil and water supply in our system. Wifi connectivity is required to send notifications and data to farmers as well as to ON and OFF the system. The goal of this paper is to control the water pump remotely by using mobile application and we can likewise observe live video streaming or photos of irrigation system on android mobiles by utilizing wi-fi.

Fig. 1 System Architecture

As shown in Fig.1 three sensors will be used in system. And by using mobile app on user's phone one can operate watering system from remote location. Also user can watch live streaming captured by camera sensor attached to Arduino board.

Soil Moisture Sensor:

This sensor measures the volumetric content of water inside the soil and gives us the moisture level as output. We can use FC-28 sensor for the same purpose. Sensor can be used in analog as well as digital mode.

Temperature Sensor:

Temperature Sensor can be used to find out surrounding atmospheric temperature. On the basis of environmental temperature and soil humidity content system can take decision about in what quantity we should provide water to the crops.

Camera Sensor:

Different options for Camera with Arduino boards are available. As per our requirement we can use camera for Arduino board to capture live streaming or photo of watering system to ensure it is properly working.

Arduino :

Arduino is an microcontroller with piece of software for IoT applications. It comes with its own IDE (Arduino IDE) and its own open source extensible hardware. Fig. 2 shows Arduino board architecture.

Fig. 2 Arduino Board

System will work in the way shown in Fig.1. System periodically checks soil moisture content and temperature of surrounding. On the basis of those value if soil moisture is below threshold value then system will send alert to user. User (farmer) then can start or stop water pump and irrigation system by using mobile phone application. User also can keep watch whether watering system and pump is working properly or not by using photos and video capture by camera connected to Arduino board.

IV. Conclusion:

In the current era the farmers use manual irrigation system, in which the farmers provide water to the land at regular intervals. This process can consume sometimes more water and water wastage can be problem. Proposed system will monitor and control the water supply only when essential in the field. Installing this new irrigation system will save time and ensures careful usage of water. In addition proposed architecture will use micro-controller which promises an increase in system life and reduction in power consumption. Thus system will also reduce man power required to operate irrigation system. And system can be operated from remote location.

In future previous atmospheric conditions, soil type, crop type and water supplied can be taken into consideration so that system itself can control threshold value for moisture content and then can fully control water supply.

V. References:

[1] Dweepayan Mishra, Arzeena Khan, Rajeev Tiwari, Shuchi Upadhay, "Automated Irrigation System-IoT Based Approach", 3rd International Conference On Internet of Things: Smart Innovation and Usages (IoT-SIU), 2018, Page no.1-4

[2] Vaishali S, Suraj S, Vignesh G, Dhivya S and Udhayakumar S, "Mobile Integrated Smart Irrigation Management and Monitoring System Using IOT", International Conference on Communication and Signal Processing, April 2017, 2064-2067

[3] Prateek Jain, Prakash Kumar, D.K. Palwalia, "Irrigation Management System with micro- Controller Application", 1st International Conference on Electronics, Materials Engineering and Nano-Technology (IEMENTech), 2017

[4] Dr. M.MAHALAKSHMI, S.PRIYANKA, Dr.S.P.RAJARAM, R.RAJAPRIYA, "Distant Monitoring and Controlling of Solar Driven Irrigation System through IoT", 2018 National Power Engineering Conference (NPEC), 2018