**SYNOPSIS**

**Automation in Irrigation**

**Submitted to:**

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**1. INTRODUCTION**

The world population is expected to reach 9.1 billion by year 2050 says FAO (World Food and Agriculture Organization) and to feed this population food production should be increased by at least 70%. Developing countries have to double their food production. The traditional methods of farming and ever decreasing farm labour availability is making agriculture economically unviable and inefficient. In above context research on development of intelligent, autonomous machinery for carrying agricultural activities is essential to improve the quantity and quality of the agricultural produce. Today there is an urgent need to address the issue of improper water irrigation for crops and the high labour cost for crop management. Automation of farming practices has proved to increase the food production levels.

The Internet of things (IOT) is remodelling the agriculture enabling the farmers with the wide range of techniques such as precision and sustainable agriculture to face challenges in the field. IOT technology helps in collecting information about conditions like weather, moisture and temperature. Crop online monitoring enables detection of level of water, pest detection, animal intrusion in to the field, crop growth, agriculture. IOT leverages farmers to get connected to his farm from anywhere and anytime. Wireless sensor networks are used for monitoring the farm conditions and micro controllers are used to control and automate the farm processes. A smart phone empowers farmer to keep updated with the ongoing conditions of his agricultural land using IOT at any time and any part of the world. IOT technology can reduce the cost and enhance the productivity of traditional farming.

**2. SUMMARY OF THE RESEARCH PAPERS**

[1] S. R. Kumbhar, Arjun P. Ghatule Internet of Things has enabled the agriculture crop monitoring easy and efficient to enhance the productivity of the crop and hence profits for the farmer. Wireless sensor network and sensors of different types are used to collect the information of crop conditions and environmental changes and this information is transmitted through network to the farmer/devices that initiates corrective actions.

[2] Yunseop (James) Kim, Member This paper provided extensive details for the wireless communication interface of sensors from in-field sensor stations and for a programmable logic controller from a control station to the computer at a base station. Bluetooth wireless technology used in this paper offered a plug-and-play communication module and saved significant time and expense by using commercially available sensors and controllers equipped with serial communication ports.

[3] Venkata Naga Rohit Gunturi The main aim of this paper is to provide automatic irrigation to the plants which helps in saving money and water. The entire system is controlled using 8051 micro controller which is programmed as giving the interrupt signal to the sprinkler. Temperature sensor and humidity sensor are connected to internal ports of micro controller via comparator, whenever there is a change in temperature and humidity of the surroundings these sensors senses the change in temperature and humidity and gives an interrupt signal to the micro-controller and thus the sprinkler is activated.

[4] Mahir Dursun and Semih Ozden From the convenience of android application, a farmer will be able to control the motor and irrigation process. The project will allow for improving the efficiency of the irrigation process. Using this android application user can also get all information about particular crop(Fertilization process, online information about pesticides, online farming videos etc.).

**3. FINDING OF THE RESEARCH PAPERS**

[1] S. R. Kumbhar, Arjun P. Ghatule Farmers are connected and aware of the conditions of the agricultural field at anytime and anywhere in the world. Some disadvantages in communication must be overcome by advancing the technology to consume less energy and also by making user interface ease of use.

[2] Yunseop (James) Kim, Member This paper describes details of the design and instrumentation of variable rate irrigation, a wireless sensor network, and software for real-time in-field sensing and control of a site-specific precision linear-move irrigation system.

[3] Venkata Naga Rohit Gunturi The system provides with several benefits and can operate with less manpower. The system supplies water only when the humidity in the soil goes below the reference. Due to the direct transfer of water to the roots water conservation takes place and also helps to maintain the moisture to soil ratio at the root zone constant to some extent.

[4] Mahir Dursun and Semih Ozden This paper proposes a new architecture for remote control of agriculture devices. The paper here is all about automated control features with latest electronic technology using microcontroller and Bluetooth Devices. The project works automatically and hence reduces the man power.

**4. PROBLEM STATEMENT**

This is the project from the motivation of the farmers working in the farm lands are solely dependent on the rains and bore wells for irrigation of their land. In recent times, the farmers have been using irrigation technique through the manual control in which the farmers irrigate the land at regular intervals by turning the water-pump ON/OFF when required. They may have to travel so far for SWITCHING ON/OFF the motor. They may be suffering from hot Sun, rain and night time too. After reaching their farm, they found that there is no power, so they quietly disappointed to it.

**5. OBJECTIVE**

**6.1 HARDWARE REQUIREMENTS**

* Arduino
* Moisture sensor
* Temperature sensor
* Relays and motors

**6.2 SOFTWARE REQUIREMENTS**

* Android Studio
* Arduino IDE
* Speech to Text Recognition API

**7. SOLUTION**

**8. REFERENCES**

[1] S. R. Kumbhar, Arjun P. Ghatule, “Microcontroller based Controlled Irrigation System for Plantation”, Proceedings of the International Multi Conference of Engineers and Computer Scientists 2013 VolumeII, March 2013.

[2] Yunseop (James) Kim, Member, IEEE, Robert G. Evans, and William M. Iversen, “Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network”, IEEETRANSACTIONS ON INSTRUMENTATION ANDMEASUREMENT, Volume 57, Number 7, JULY 2008.

[3] Venkata Naga Rohit Gunturi, “Micro Controller Based Automatic Plant Irrigation System”, International Journal of Advancements in Research & Technology, Volume 2, Issue4, April-2013.

[4] Mahir Dursun and Semih Ozden, “A wireless application of drip irrigation automation supported by soil moisture sensors”, ScientificResearch and Essays, Volume 6(7), pp. 1573-1582, 4 April, 2011.