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# IOT Based Round Pipe Irrigation and Pivots System

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**A B S T R A C T**

For most people in our nation, agriculture is their main source of income. India's agricultural output is declining. People who depend on agriculture should be aware of how to employ emerging technologies to address issues like water shortages and excessive spending on agricultural supplies. The farmers suffer significant financial losses as a result, which drives them to commit suicide. Every technical advance should be sought because agriculture is such a crucial problem. The need for agriculture has expanded significantly as the world's population has multiplied, yet farmers are unable to meet the unending need. A better approach than increasing agricultural size is to use smart or precision agriculture practices using IoT. The number, quality, and health of the crop are all directly influenced by the micro- and macronutrients in the soil. In the past, the health of the soil and crops were assessed through human observation and judgement.

Keywords: IOT, Internet of Things, AUTOMATIC SPRINKLER IRRIGATION

## 1. Introduction

Agriculture, which also supports more than half of all human life, is a major factor in India's overall economic performance. Numerous issues affect this industry, such as insufficient water supplies, workforce management, product marketing, etc. Undoubtedly, one of the key concerns in this area is the management of water. To boost crop output over the same amount of field, traditional agricultural practices must be updated. Smart farming, a more precise and controlled method of growing crops, is essential to help farmers boost agricultural productivity. It can be applied in a variety of ways to assist farmers in producing more in the agricultural sector. The three main processes are smart planning and analysis, smart control, and smart sensing and monitoring. By using precision farming, inadvertent wastage of raw materials is eliminated. Precision farming, according to study, boosts yield by 40–60%, premium prices rise by 30–40%, and farmers are able to live better lives. Most of the time, poor water management causes consumption rates that are below ideal levels, and on occasion, a certain amount of water is lost. Consequently, we require a model in order to manage the crop and soil and achieve the best output. The maturity stage of the crop greatly affects both its quality during ripening and its marketability after ripening. When it comes to maximizing the harvesting window and avoiding the collection of either an under- or an over-matured crop, farmers' ability to judge crop maturity will be a significant asset.

### *1.1 Objective of Research*

• To create a mechanism that farmers can use for effective irrigation.

• To create a system that aids farmers in determining the crop ripeness.

• This method may prove useful in agriculture by detecting the soil's moisture content and adjusting the watering schedule accordingly.

• To offer a system for automatic irrigation.

• To provide farmers with a practical crop security technique.

## 2. Proposed Work

The suggested system receives data from field sensors and produces the desired result. In this research, three primary sensors are utilized. PIR motion sensor, moisture sensor, and PH sensor are what they are. The existing agricultural practices in India face significant challenges that hinder the efficient utilization of resources and optimal crop production. These challenges include water scarcity, population growth, and outdated irrigation techniques. The lack of effective water control during irrigation and the absence of modernized approaches have led to reduced crop yields and inefficient use of water resources. Additionally, the reliance on conventional irrigation methods limits the ability to adapt to changing environmental conditions and optimize agricultural productivity.

This case study aims to address these challenges by implementing an IoT-based irrigation system in Indian agriculture. The system aims to improve water management, enhance crop yield, and promote sustainable farming practices. By leveraging sensor data, cloud computing, and advanced control algorithms, the proposed system will provide real-time monitoring and control of irrigation processes. This will enable precise water distribution based on crop requirements, soil conditions, and environmental factors, leading to optimized water usage and increased crop productivity.

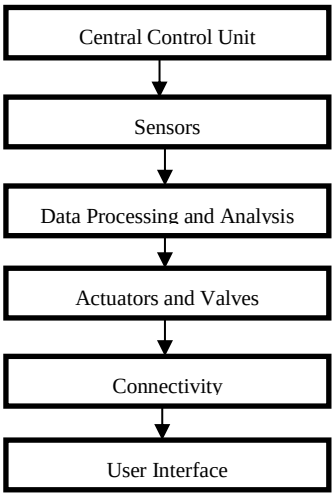


**Fig. 1 - Overview of System Design.**

This phase consists of a design which gives a rough idea about the project and the implementation is done based on this design. Since we are following the agile method of development, the design can be changed at any stage during the development. The final design of the project is described below.

This phase includes a design that provides a broad overview of the project, and implementation is carried out in accordance with this design. The design can be updated at any point during the development process because we are using the agile method. Below is a description of the project's final design.

To detect the mechanical, physical, and chemical aspects of soil, there are many kinds of sensors. We concentrate on sensors that measure soil moisture and pH levels. The analogue input on the Arduino board receives the output from these sensors. The built-in Wi-Fi Module located on the board is used to transmit the data gathered from these sensors to the Thing speak cloud platform. Machine learning algorithms will identify the crops that are matured or immature using the data.

Automated approaches have taken the role of the manual watering method. The goal of the project is to create an automated irrigation system that turns on and off the pump motor in response to moisture levels in the field as detected by a moisture sensor. The analogue input on the Arduino board receives the output from the moisture sensor. The L298N Motor Driver Controller Module linked to the pump receives the output of the Arduino. The board is programmed to switch the pump ON/OFF depending on the input provided by the moisture sensor with the aid of Arduino programming. The system compares the analyzed noise data against predefined thresholds, which could be based on local regulations or community standards. If the noise levels exceed these thresholds, an alert system is triggered to notify relevant stakeholders, enabling them to take appropriate actions. The system enables users to generate reports and perform data analysis on the collected noise data. This helps stakeholders gain insights, identify trends, and make informed decisions regarding noise pollution management. Trigger Actuator and Valves will switch on the actuators so the irrigation can be done without any human intervention.

The motion sensor is also used to keep animals and birds away from the crops. If there are any substantial changes, the motion sensor will detect them and emit a sound indication. The sensor primarily picks up the infrared radiations that living things emit, or to put it simply, the body heat of animals and birds that are nearby the area. The Arduino board's digital input receives the sensor's output. The buzzer receives its output. Every time the input from the PIR motion sensor changes, the buzzer is activated according to the board's programming.

## 3. Conclusions

The Internet of Things has recently gained widespread recognition. Thanks to its many sources of applications, which have made it possible for people to live comfortably, healthily, and more simply. The proposed system is tremendously beneficial to the agricultural industry. The farmer's life will be made easier by this technology, which also increases yield. This project greatly boosts production while modernizing the agriculture industry. This system has very little human involvement, which lowers the chance of mistakes. With the aid of wireless sensor networks, it also assisted in the introduction of smart irrigation systems. Additionally, it provided a practical solution to the issue of animal incursion that most farmers experienced. In order to ameliorate crop affairs and reduce water waste, this design offers a new strategy that makes use of IoT, Arduino, and machine literacy technologies. By exercising an IoT strategy like Thing Speak, the irrigation system is automatically actuated by the system when a machine literacy fashion detects crop maturity, guaranteeing that the crops admit the proper quantum of water at the proper time.

The Arduino board serves as the primary piece of tackle, controlling the irrigation system and connecting to the IoT platform through periodical connection. The conception offers a lot of pledges to advance agricultural practices, particularly in areas with scarce water coffers. Water effectiveness, agrarian yields, and profitability can all be significantly increased with IoT and machine literacy technologies.

To provide a more complete image of the crop environment, the project's future scope can be expanded to include additional sensors. This would make it possible to estimate crop maturity and water needs with more accuracy, resulting in irrigation techniques that are even more effective. By combining real-time meteorological data to modify irrigation schedules based on rainfall and other environmental parameters, the system can also be improved. In conclusion, this effort presents a workable way to apply cutting-edge technology to improve crop output and resource management in agriculture.

**References**

[1] A. Shilpa; V. Muneeswaran; Devi Kala D. Rathinam (06 June 2019). " A Precise and Autonomous Irrigation System For Agriculture: IoT Based Self Propelled Center Pivot Irrigation System". Retrieved from https://ieeexplore.ieee.org/document/8728550

[2] S. Rajapriya, M. Shifa Parveen, S.V. Vasunthra, S. Vinu Bharathi, P. Suresh. " An IoT Based Self Propelled Irrigation System for Agriculture". Retrieved from https://www.jcreview.com/admin/Uploads/Files/61c9e2827ae2f7.39662379.pdf

[3] Sameer Saurav, Arun Kumar, Md Farhan Ahmad. " A review on Internet of Things (IOT) based Smart Irrigation System". Retrieved from https://www.jetir.org/papers/JETIR2105090.pdf

[4] Dr. Y Jeevan Nagendra Kumar, Spandana, V., Vaishnavi, V. S., Neha, K., & Devi, V. G. R. R. (2020, June). Supervised machine learning approach for crop yield prediction in agriculture sector. In 2020 5th International Conference on Communication and Electronics Systems (ICCES) (pp. 736-741). IEEE.

[5] Yash Bhojwani, Singh, R., Reddy, R., & Perumal, B. (2020, February). Crop selection and IoT based monitoring system for precision agriculture. In 2020 International Conference on Emerging Trends in Information Technology and Engineering (icETITE) (pp. 1-11). IEEE.

[6] Anitha, A., Sampath, N., & Jerlin, M. A. (2020, February). Smart irrigation system using Internet of Things. In 2020 International Conference on Emerging Trends in Information Technology and Engineering (icETITE) (pp. 1-7). IEEE.

[7] Rohith, M., Sainivedhana, R., & Fatima, N. S. (2021, May). IoT enabled smart farming and irrigation system. In 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS) (pp. 434-439). IEEE.

[8] Garanayak, M., Sahu, G., Mohanty, S. N., & Jagadev, A. K. (2021). Agricultural recommendation system for crops using different machine learning regression methods. International Journal of Agricultural and Environmental Information Systems (IJAEIS), 12(1), 1-20.