PROJECT DOCUMENTATION

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VISION-BA
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Smart Sprinkler Water Flow Monitoring And Alert System.

Abstract;

This project aims to design and implement a smart sprinkler water flow monitoring and alert system that detects water flow through a buzzer and alert system (SMS) when water flow stop unexpectedly. The enhances efficiency in irrigation by saving time and ensuring consistent water distribution without manual supervision.

"Smart farming is not about doing more work — it's about working smarter to protect time, resources, and the future of agriculture."

Problem statement;

Farmers who use irrigation systems especially sprinklers often face the challenges in monitoring water flows during irrigation. Many times, blockages or pressure drops occur over overnight, causing water to stop flow without acknowledge.

This forces them to walk long distances every morning to check if water was flowing properly during the night, such manual monitoring leads to wasted time , delayed responses to fault and insufficient irrigation.

This project aims to eliminate that problem by introducing an automatic system that detects when water stops flowing and alert the farmer instantly through SMS or buzzer sounds.

Motivation and significances;

This project is motivated by the need to save farmer's time and energy while improving irrigation reliability. As a student from family background, I experienced firsthand how unpredictable water flows can affect crop growth and waste valuable time. Implementing a smart monitoring system will reduce human effort, prevent water wastage and ensure better irrigation efficiency.

Moreover, this project contributes to the advancement of smart agriculture technologies that make farming more reliable, sustainable and automated.

Objectives;

* ❖ To monitor water flows in sprinkler irrigation systems automatically
* ❖ To alert the user via SMS when water flows stop
* ❖ To improve irrigation efficiency and reduce the need for manual monitoring

System overview;

This system consists of water flow sensor connected to a microcontroller (Arduino) which continuous monitors water movement when water stops flowing, the Arduino triggers a buzzer and sends an SMS alert through a SMS module to inform the user immediately.

Hardware components;

- ❖ Arduino Uno
- ❖ Water flow sensor
- ❖ GSM modules
- ❖ Buzzer
- ❖ Power supply
- ❖ Connecting wires
- ❖ Breadboard

Working principle;

When irrigation system is running, the flow sensor continuously sends pulses to the Arduino, indicating water flows, If the pulse for a certain duration, it means that water flow has stopped.

The Arduino will then activates the buzzer form local alerts and send an SMS via GSM to the user's mobile phone.

Software design;

Algorithm steps to run a system will be as follows;

1. Start
2. Initialize flow sensor, GSM modules and buzzer
3. Continuous read water flow pulses
4. If water flow detected then continuing monitoring
5. If water flow stops for a set duration the activate buzzer and sends SMS alert
6. Repeat the loop.

Future enhancement;

This project provides a practical solution to one of the common problems faced by farmers using sprinklers irrigation.

Furthermore, by introducing automation and alerts, it reduces that need for manual checking and enhances irrigation management.

It serves as a step toward smart agriculture and sustainability in a rapid changing world.