A LOW PRICE SENSIBLE IRRIGATION CONTROL SYSTEM

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Abstract

This paper specialise in a smart irrigation system that is price effective and a socioeconomic class farmer use it in farm field. These days we have seen automation is enjoying vital role in human life. Automation permits us to control appliances automatically. It not solely offer comfort however conjointly reduce energy, potency and time saving. These days industries use automation and management machine that is high in value and not appropriate for exploitation in a farm field. Thus here we have a tendency to conjointly design a wise irrigation technology in low value that is usable by Indian farmers. The objectives of this paper were to regulate the water motor mechanically and choose the direction of the flow of water in pipe with the assistance of soil moisture sensor device. Finally send the information (operation of the motor and direction of water) of the farm field to the mobile app of the user.

Keywords: Soil sensor, Electromagnetic valve, Raspberry-Pi, Relays, Wireless sensor Network (WSN), mobile App.

1. Introduction

In our country Agriculture is major supply of food production to the growing demand of human population.

In agriculture, irrigation is a vital method that influences crop production. typically farmers visit their agriculture fields sporadically to visualize soil wet level and supported demand water is wired by motors to irrigate various fields. Farmer have to be compelled to anticipate certain amount before switch off motor in order that water is allowed to flow in spare amount in various fields. This irrigation technique takes ton of your time and energy notably once a farmer have to be compelled to irrigate multiple agriculture fields distributed in numerous geographical areas. historically farmers can gift in their fields to try and do irrigation method. however today farmers have to be compelled to manage their agricultural activity along with different occupations. Automation in irrigation system makes farmer work a lot of easier. sensor based mostly automatic irrigation system provides promising resolution to farmers wherever presence of farmer in field isn't mandatory. A little processor programmed for management a magnetic attraction valve and conjointly compare to magnetic attraction valve operate motor to start out watering. Extremely INDIAN farmers want low cost and easy computer programme for dominant device based mostly automatic irrigation system. Currently a day's web is wide used. Mistreatment web farmer know about the agriculture field irrigation status. This helps farmers to understand the status of farm field watering direction have an ability to seen in their mobile by using an such app which is integrated to Raspberry-Pi board, whether the farmer is faraway from field grasp the standing of water motor is ON or OFF and direction of watering have also to be seen in their mobile.

In this paper we present a prototype for automation accessing of irrigation motor where Prototype includes number of sensor node placed in different directions of farm field. Each Sensors are integrated with a wireless networking device and all sensors are connected to Raspberry-Pi board.

2. Importance of irrigation

The rainfall of in our country depends on monsoons. Rainfall controls agriculture, however the agriculture is claimed to be "the

gambling of the monsoon" because the monsoon rain are unsure, irregular and uneven or unequal. Thus irrigation is important for agriculture. In India there are 80th of the whole annual rain happens in four months, i.e. from middle June to middle October. Thus it's during necessary to irrigation for farm field throughout during of the eight months.

3. Ways of irrigation

There are many techniques for irrigating farm field for various types crop field. Essentially Indian farmer use these 3 ways channel system, sprinkler system, drip system. Channel system could be a ancient technique of irrigation. However a wise irrigation system could be a new technology to irrigating farm field mechanically.

A. Channel System

This technique is wide utilized in farming irrigation system. As this technique could be a terribly low value system for irrigating a large space farming field. During this system pipes are connected with a pump and whereas pump started water flow through pipe a from lake, river, bore well to farming field. and also the farmer totally engaged for irrigating the crop field with variety of workers. large amount of water waste and huge variety of staff are engaged during watering.

Fig1: channel system irrigation

B. Sprinkler system

This method is a lot of helpful whether the water is obtainable in smaller amount. once pump started then water flow through main pipe and also flow through the perpendicular pipes. A nozzle on the top of perpendicular pipe is joined and rotating mechanically at regular intervals. This system is incredibly helpful on the sandy soil. Less variety of employee needed water waste is a smaller amount

Fig2: Sprinkler system

C. Drip System

During this system waterfall drop by drop at the position of the roots. it's is incredibly technology for watering fruit plants, gardens and trees. Special ready nozzles are connected to those sub pipes, during this system waste of water is incredibly less and No worker would like for irrigating. once the farmer is aware of the standing of the farm field then begin the motor and selected the direction from nozzles. Then automatically watering the plants and when the farmer check the standing of the field and while the full crop area unit irrigating then OFF the motor.

Fig3: Drip system

Smart Irrigation system

Proposed work

Above three systems are generally operate by a user but a smart irrigation tells that the total system is controlled by autonomous mean automatically control the total irrigation system

whether the farmer is not present his farm field he can know the information of farm field and change in operation of the farm field. Which need no employee for in operation, and conjointly less waste of water with compared to previous 3 strategies.

In this sensor nodes are placed in different directions of farm field. Each sensors are integrated with a wireless networking device and all sensors are connected to Raspberry-Pi board. And we have inserted Relays in between board and motor to automatically on and off. And here we presented an app and it is integrated to Raspberry-pi board. And all the sensors in field are also connected to board.and the field consists of automatic valves, when the soil moisture is not up to a specified value an alert message to the user mobile and automatically that specified valve has to opened and start send water to that field.

When the motor was on and the app in the mobile shows with a green button and when the water was flowing through the pipes connected to motor it shows blue button. And here another situation, when the farmer wants to send the water to field2 and he can press the valve2 button of field2 in his app and automatically Raspberry-pi board on the motor through Relays and open the electronic automatic valve2 and send the water to field2. And all the process was to be handled by the farmer through this app in his mobile, who is far away from the fieid. And he has an ability to off the motor valves through this app.

Fig 4: Electronic automatic valve

Electromagnetic valve have 3 pipe connections and 2 orifices. Once one orifice is open, the opposite is closed and contrariwise. Which is mechanically controlled by the water demand of sensor node.

4. System Architecture
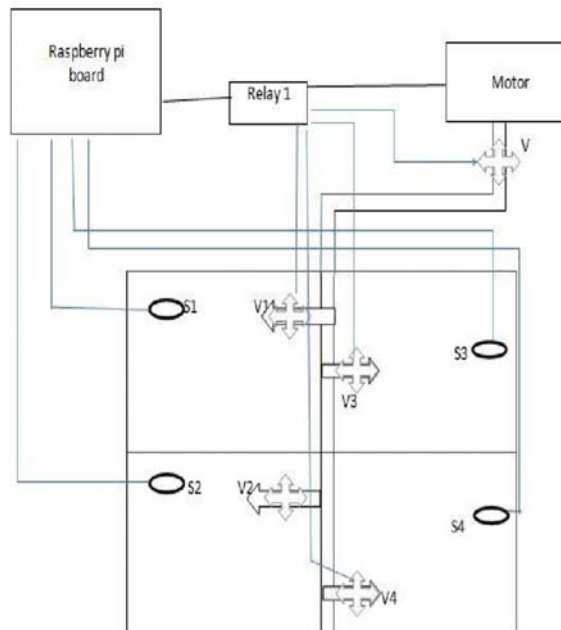
5. Conclusion

In this paper we have atendency to tend to present a example for automatic dominant a irrigation system. Here prototypes includes sensing element node and control node. The sensor node is deployed in irrigation field for sensing soil wet worth and in addition the detected information is distributed to controller node.On receiving sensing element value the controller node(raspberry-piboard) checks it with required soil wet value. once soil wet in irrigation field is not up to specified level then the motor is switched on automatically and to open that specified valve to irrigate associated agriculture field and alert message is send to registered mobile. this method is used during a remote space and there area unit varied benefits for the farmers. By exploitation the automated irrigation system it optimizes the usage of water by reducing wastage and scale back the human intervention for farmers. It saves energy because it automatic controlling the system.

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