

AUTOMATIC IRRIGATION SYSTEM ON SENSING SOIL MOISTURE CONTENT

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ABSTRACT:

This project on "Automatic Irrigation System on Sensing Soil condition Content" is supposed to create AN automaticirrigation mechanism that turns the pumping motor ON and OFF on investigating the Dampness content of the earth.In the domain of farming, utilization of applicable means that of irrigation is critical.The advantage of using these techniques is to decrease human interference and still confirm applicable rrigation.This automated irrigation project brings into play an Arduino board ATmega328 micro-controller , is programmed to collect the input signal of changeable dampness circumstances of the earth via dampness detecting system.

Keywords: Microcontroller, Irrigation, Soil Moisture Content, Automated Irrigation Mechanism.

INTRODUCTION

The continuous increasing demand of food needs the speedy improvement in food production technology.

In a country like India, where the economy is mainly based on agriculture and the climatic conditions are isotropic, still we are not able to make full use of agricultural resources. The main reason is that the lack of rains of land reservoir water. The continuous extraction of water from earth is reducing the water level thanks to that ton of land is coming back, slowly within the zones of un-irrigated land.

Another important reason of this is often thanks to unplanned use of water thanks to that a big quantity of water goes to waste.In trendy drip irrigation systems, the foremost important advantage is that water is equipped close to the basiszone of the plants drip by drip thanks to that an oversized amount Of water is saved. At this era, the farmers are mistreatment irrigation techniques in Bharat through manual management during which farmers irrigate the land at the regular intervals. This method typically consumes additional water or typically the water reaches late thanks to that crops get dried.Water deficiency are often damaging to plants before visible weakening happens. Slowed rate, lighter weight fruit follows slight water deficiency. This downside are often dead corrected if we have a tendency to use automatic small controller based mostly drip irrigation system during which the irrigation can present itself only if there'll be acute requirement of water.

IRRIGATION

Irrigation system uses valves to show irrigation ON and OFF.These valves could also be simply machine-driven by victimization controllers and solenoids.Automating farm or nursery

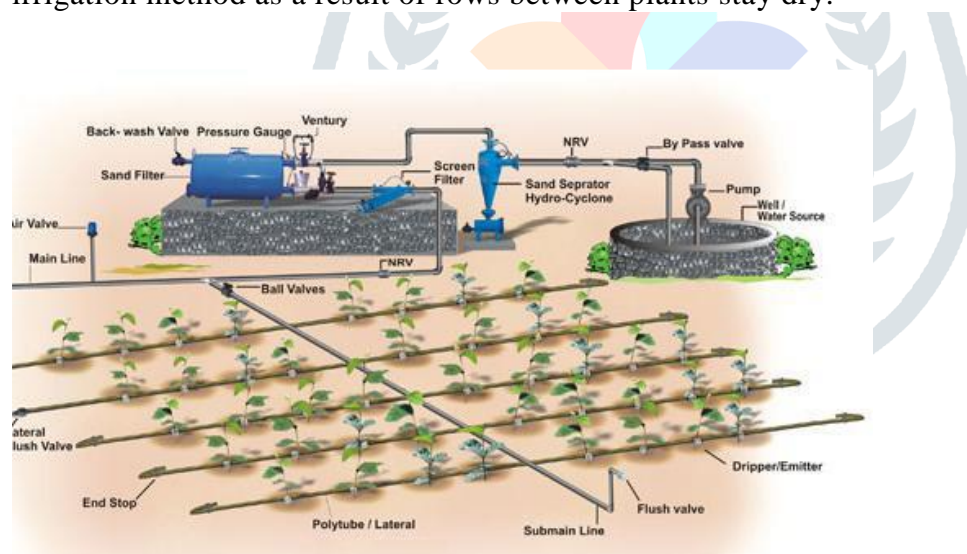
Irrigation allows farmers to apply the right amount of water at the right time, regardless of the availability of lab or to turn valves on and off. In addition, farmers using automation equipment are able to reduce runoff from over watering saturated soils, avoid irrigating at the wrong time of day, which will improve crop performance by ensuring adequate water and nutrients when needed.Automatic Drip Irrigation may be a valuable tool for correct soil wetControl in extremely specialised greenhouse vegetable production

and it's a straightforward, precise method for irrigation. It additionally helps in time saving, removal of human error in adjusting available soil moisture levels and to maximize their net profits. Irrigation is that the artificial application of water to the soil usually for assisting in growing crops. In crop production it's primarily utilized in dry areas and in periods of rain shortfalls, but also to protect plants against frost.

Types of Irrigation

- Surface irrigation
- Localized irrigation
- Drip Irrigation
- Sprinkler irrigation

The conventional irrigation strategies like overhead sprinklers, flood type feeding systems usually wet the lower leaves and stem of the plants. The entire soil surface is saturated and infrequently stays wet long when irrigation is completed. Such condition promotes infections by leaf mould fungi. On the contrary the drip or trickle irrigation is a type of recent irrigation technique that slowly applies tiny amounts of water to a part of plant root zone. Water is equipped oft, often daily to maintain favourable soil moisture condition and prevent moisture stress in the plant with proper use of water resources. Drip irrigation saves water as a result of solely the plant's root zone receives wet. Little water is lost to deep percolation if the right quantity is applied. Drip irrigation is well-liked as a result of it will increase yields and reduce each water needs and Labour. Drip irrigation needs concerning 1/2 the water required by mechanical device or surface irrigation. Lower operating pressures and flow rates result in reduced energy costs. A higher degree of water control is attainable. Plants may be furnished with additional precise amounts of water. Disease and bug injury is reduced as a result of plant foliage stays dry. Operating cost is usually reduced. Federations might continue throughout the irrigation method as a result of rows between plants stay dry.

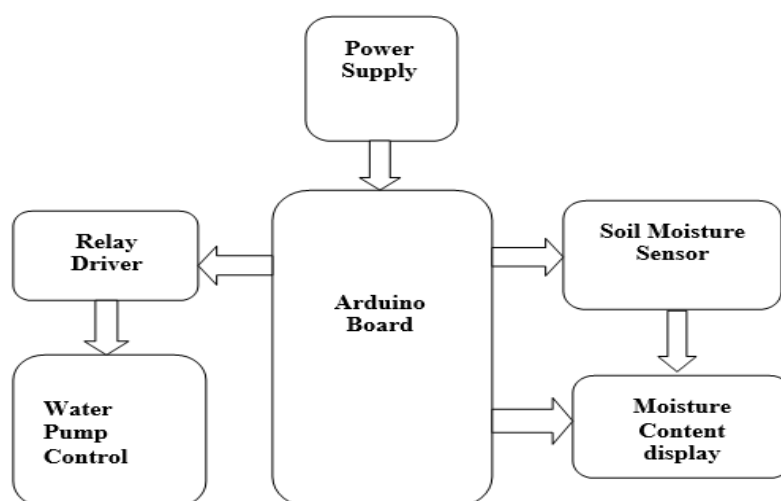


The on top of fig one explains regarding necessary parameters to be measured for automation of irrigation system square measure soil wetness. The entire field is initial divided into little sections such every section ought to contain one wetness detector. These sensors square measure buried within the ground at needed depth. Once the soil has reached desired moisture Level the sensors send a signal to the micro controller to turn on the relays, which control the motor. In planned system, machine-controlled irrigation mechanism that turns the pumping motor ON and OFF on police investigation the moistness content of the world. In the domain of farming, utilization of appropriate means of irrigation is significant. The good thing about using these techniques is to decrease human interference. This machine-controlled irrigation project, the soil sensor senses the moisture content by giving input signal to an Arduino board which operates on ATmega328 micro-controller, is programmed to collect the input signal of changeable moistness circumstances of the world via moistness police investigation system.

SOIL MOISTURE

Soil wet is a very important part within the atmospherical water cycle, each on a little agricultural scale and in large-scale modelling of land/atmosphere interaction. Vegetation and crops always depend more on the moisture available at root level than on precipitation occurrence. Water budgeting for irrigation coming up with, likewise because the actual planning of irrigation action, needs native soil wet data. Knowledge of the degree of soil status helps to forecast the chance of flash floods, or the incidence of fog. Soil water content is an expression of the mass or volume of water within the soil, whereas the soil water potential is an expression of the soil water energy standing. The relation between content and potential isn't universal and depends on the characteristics of the native soil, like soil density and soil texture. The basic technique for activity soil water content is that the measurement methodology. Because this methodology relies on direct measurements, it's the quality with that all different strategies are compared. Unfortunately, measurement sampling is harmful, rendering repeat measurements on constant soil sample not possible. Because of the difficulties of accurately activity dry soil and water volumes, volumetrical water contents don't seem to be sometimes determined directly. The capability of soil to retain water could be a operate of soil texture and structure. When removing a soil sample, the soil being evaluated is disturbed, so its water-holding capacity is altered. Indirect strategies of activity soil water are useful as they permit data to be collected at constant location for several observations while not troubling the soil water system. Moreover, most indirect strategies confirm the volumetrical soil water content with none would like for soil density determination. The new soil wet detector uses Immersion Gold that protects the nickel from chemical reaction. Electrodes nickel immersion gold (ENIG) has several advantages over more conventional (and cheaper) surface plating such as HASL (solder), including excellent surface planarity (particularly helpful for PCB's with large BGA packages), sensible chemical reaction resistance, and usefulness for untreated contact surfaces like membrane switches and phone points. A soil wet detector will scan the number of wet gift within the soil close it. It's a low technical school detector, however ideal for watching an urban garden, or your pet plant's water level. This is a requirement have tool for a connected garden. This detector uses **the two** probes to pass current through the soil, and then it reads that resistance to get the moisture level. More water makes the soil conduct electricity additional simply (less resistance), whereas dry soil conducts electricity poorly (more resistance).

BLOCK DIAGRAM AND WORKING



The on top of fig a pair of shows Microcontroller based mostly irrigation system proves to be a true time feedback system that monitors and controls all the activities of drip irrigation system with efficiency.

The present proposal could be a model to modernize the agriculture industries on a little scale with optimum expenditure.

Using this technique, one can save manpower, water to improve production and ultimately profit.

RESULT

Irrigation becomes straightforward, accurate and practical with the idea above shared and can be implemented in agricultural fields in future to promote agriculture to next level.

The output from wet sensing element and level system plays major role in manufacturing the output.

CONCLUSION

The primary applications for this project square measure for farmers and gardeners WHO don't have enough time to water their crops/plants. It conjointly covers those farmers WHO square measure wasteful of water throughout irrigation. The project are often extended to greenhouses wherever manual direction is way and few in between. The principle are often extended to make totally machine-driven gardens and farmlands. Combined with the principle of rain water harvesting, it could lead to huge water savings if applied in the right manner. In agricultural lands with severe shortage of downfall, this model are often with success applied to attain nice results with most styles of soil.

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