SOLAR POWERED AUTOMATIC IRRIGATION BASED ON THE IOT

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ABSTRACT:

In order to keep their crops green, particularly in the summer, ranchers in the farming industry face a great deal of challenges while dumping water into their fields. They lack a proper understanding of the power accessibility, which is the reason for this. They must wait till the field has been properly irrigated even though it is accessible. They are then asked to stop performing other demonstrations using this technique. But there is a solution—a "solar powered auto irrigation system" to be precise. In the initial stages of a solar-powered irrigation system, PV cells are used to generate electricity, which is then stored in battery-operated batteries. System activity uses the energy that is given by the batteries. It is a water syphon.

I.INTRODUCTION

As we become aware of the fact that the Indian economy is among the most dynamic worldwide. The largest contribution to the Indian economy is made by the horticultural sector. The various designing strategies currently in use need to be upgraded in order to achieve the most extreme use of labour and to obtain the maximum benefit in a particular specified.Consequently keeping up with appropriatemeasure of water level in the soil is one oftheessentialprerequisitestocollectadecentyield thatcan be a wellspring ofdifferentsortsofsupplementswhetherminiature or full scale for their legitimatedevelopment.IntheeventthatwetalkaboutIndianfarmerstheyaremostnoticeablyterriblehitb ythestarvationsthat happens because of disappointment ofharvestsrelyingondifferentdryspellfactors.Downpourassumesthevitalpartinchoosingtheeventualfat eoftheseyields just as the farmers consistently. Theover usage of ground water has radicallydiminished the ground water level in thelast 15years.Soitisthe need of hour touse every single drop of water shrewdlywiththegoalthatitcanlikewisebeutilizedbyourcomingagestoo.Additionally we ought to foster some newtechniques that utilization the sustainablewellspringsofenergy.Theimprovementof these new methodswillarriveatourobjective of practical advancement just astoremovetheemanationofozonedepleting substances to a base level.As thename of our project that is AUTOMATICIRRIGATIONSYSTEMwiththeassistance of the Solar power is a stage tousesomenewdesigningstrategies.Thisprocedure will be an awesome choice forthe little and medium farmers who endureeach year on account of disappointment ofyieldsthatoccurredeachyear.The

executionofthisinnovationhasawidedegreein theclose byfuture.

One of the fundamental reasons isthe absence of downpours and shortage ofland supply water. Extraction of water atcustomaryspansfromtheearthisdecreasing the water level and because ofwhich the zones of un-flooded terrains arecontinuouslyexpanding.Thefarmersworking in the ranch lands are exclusivelysubjecttothe downpours and borewellsforirrigationoftheland.Regardlessofwhether the homesteadland has a watersiphon,manualmediationbyfarmersisneededtoturnthesiphonon/offatwhateverpoint required. Solarenergyisthemostplentifulwellspring of energy on the planet. Solarpower isn't just a solution to the presentenergyemergencyyetinadditionanecologicalwelldisposed type ofenergy.Photovoltaicageisaproductivemethodology for utilizing the solar energy.Solarboards(avarietyofphotovoltaiccells) are presently a-days widely utilizedforrunningstreetlamps,forpoweringwaterwarmersandtomeethomegrownburdens. The expense of solar boards hasbeencontinuallydiminishingwhichenergizes its use in different areas. One ofthe uses of this innovation is utilized inirrigationsystemsforcultivating.Solarpoweredirrigationsystemcanbeanappropriateoptionforfarmersint hecurrent situation with energy emergency inIndia. This green way for energy creationwhichgivesfreeenergyonceanunderlyingventureis made[2].

II. EXISTINGSYSTEM:

A GSM/Bluetooth based remote-controlled integrated irrigation system is part of the current system. Depending on the temperature and humidity readings from the system, the watering time is established. sensorsandtypeofcropandcanautomaticallyirrigatethefieldwhenunattended.Informationisexchange dbetween far end and designed system viaSMSon GSM network.

ABluetoothmoduleisalsointerfacedwith the main microcontroller chip whicheliminates the SMS charges when the useris within the limited range of few meters tothedesignated system.

Thesysteminformsusersaboutmanyconditionslikestatusofelectricity,dryrunningmotor,increasedtem perature,water content in soil and smoke via SMSon GSM networkor byBluetooth.

PROPOSEDSYSTEM:

We are utilising the ARDUINO UNO, WiFi module, humidity sensor, moisture sensor, temperature sensor, LCD, relay, and water motor in the suggested system. Moisture sensor, rain sensor, solar panel, and water motor are the essential electrical and electronic parts of the proposed system. The moisture sensor measures the soil's relative humidity and turns on the water motor if it is low. If it is raining, the water will be turned off if a rain sensor senses it is coming. Solar energy is converted to electrical energy by a solar panel, which is then stored in a battery. The battery-stored energy will be used to power the water. All sensor status will be shown on an LCD screen and tracked via a website. The status of the soil moisture sensor or an IOT-enabled web page will be used to operate the water motor.

MODULE DISCRIPTIONa.ARDUINOUNO:

The company's ATmega328P microcontroller is the basis for the open-source Arduino Uno microcontroller card. The card has advanced and basic info/yield (I/O) pin groups that can be connected to a variety of development cards (safeguard) and circuits. It contains 6 basic I/O sticks,

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International Journal of Computational Intelligence in Control
234

14 advanced I/O pins (six of which support PWM yield work), and a USB Type B connector that enables Arduino IDE (Integrated Development Environment) modification. Despite the fact that it can accept voltages between 7 and 20 volts, it can be powered by a USB link or an external 9-volt battery. It is comparable to Leonardo and Arduino Nano. The same Creative Commons Attribution 2.5 licence has been applied to the equipment reference configuration. It's
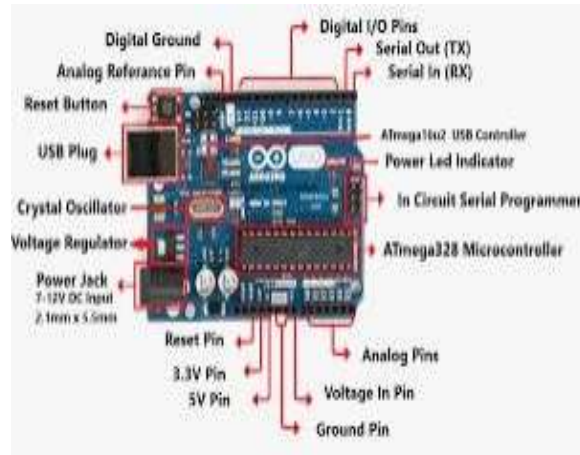

Fig1: Hardwarecomponent Aurdinouno

b. WIFIMODULE:

TheESP8266WLANmoduleisafreeSOCwithacoordinatedTCP/IPconventionstack,throughwhicheachmicrocontrollercangettoyourWLANorganization.ESP8266canhaveAPPor burden another APP processor with using the entire Wi-Fi network's resources. Every ESP8266 module has already been modified. Use ATcommand Suite firmware to give it access to as many Wi-Fi features as a WiFi screen when plugged into an Arduino device (prepared to use) The ESP8266 module is a valuable circuit board that has a sizable and rapidly expanding local area.

Fig2:Wifi module

c. SOILMOISTURESENSOR:

Thesoilmoisturesensorisonesortofsensorusedtocheckthevolumetricsubstance of water inside the soil. As thestraightgravimetricelementofsoilmoisture needs killing, drying, just as testweighting.Thesesensorsmeasurethevolumetricwatercontentnotstraightforwardlywiththeassistanc eofsomedifferentguidelinesofsoillikedielectric steady, electrical obstruction, inany case

collaboration with neutrons, andsubstitutionofthe moisturecontent.

Fig3: Soil Moisturesensor

d. RAINSENSOR:

A rain sensor is one kind of switching device which is used to detect the rainfall. It works like a switch and the working principle of this sensor is, whenever there is rain, the switch will be normally closed.

Fig3: Rainsensor

III. RESULTS

Fig4:Hardware Implementation

Fig5:Sensors status updated in Webpage

IV. CONCLUSION

The main users of this project are farmers and gardeners who don't have a lot of free time to water their plants and vegetables. Additionally, it includes farmers who misuse irrigation water. The concept can be expanded to include green houses, which rarely utilise manual management. The idea can be expanded to develop entirely automated farms and gardens. If combined with the idea of collecting rainwater, it has the potential to save a lot of water if used properly. This technique can be successfully utilised to get excellent outcomes with most types of soil in agricultural fields with significant rainfall shortages. used to transfer water from an animal well to a tank used to store water. The topic of this article is sun-oriented.

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240

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