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# Efficient Usage of Natural Resources to Automation of Agriculture Using Iot

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***Abstract:*** ***Natural resources are the part of human life. Water is also one of the natural resources. It is the main source of living things without presence of water there will be no living things on earth. Iot will be most prestigious technology in upcoming days. This paper presents an IoT device that monitors efficient usage of natural resources in agriculture. Now a days it so hard to farmer to give water, because. If he turned on the motor for soil, hedon't know whether the water is filled or not. It leads to wastage of water and also don't know water quality. So, in this system two types of sensors used in this project. pH sensor, moisture sensor. These sensors will inform the water quality and pH level. According to those values by using Iot technology the motor functioning is automatically controlled. The given data will be stored in cloud. After getting values it will be send to the farmers phone by using GSM module.This process is done without any interaction of human.It can help the farmer without wastage of water and loss of time. Iot is very friendly to the environment and it can be used every sector.This technology will be best for the farmers.***

***Keywords : IOT, environment, pH level, agriculture, moisture.***

## I. INTRODUCTION

Since the earth was inhabited. The humans and other forms of life depends upon the resources that are existed freely to survive.Natural resources are divided into two types. Renewable resources and non-renewable resources[1]. Renewable resources are the resources which are reusable. Non-renewable resources are resources which are not reusable. Some of the natural resources are water,soil,natural gas,oil,forests etc.With the expansion of savvy gadgets, Internet can be reached out into the physical domain of Internet-of-Things (IoT) by conveying them into an imparting inciting arrange. In IoT, sensors and actuators mix consistently with the condition; team up all around with one another through web to achieve a particular undertaking. wireless Sensor Network (WSN) can be coordinated into IoT to address the difficulties of consistent correspondence between any things (e.g., people or objects). The possibilities of IoT can be conveyed to the advantage of society by creating novel applications in transportation and co-ordinations, human services, agribusiness, savvy condition (home, office or plant)[2].

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This explorationgives a structure of upgrading assets (water, manures, bug sprays and difficult work) in agribusiness using IoT. The issues engaged with the execution of uses are likewise examined in the paper. This casing work is named as AgriTech[3].These days Internet of Things (IoT) and Remote Sensing (RS) strategies are utilized in various territory of look into for observing, gathering and examination information from remote areas. Because of the tremendous increment in worldwide mechanical yield, country to urban float and the over-use of land also, ocean assets, the nature of water accessible to individuals has crumbled extraordinarily[3]. The high utilization of composts in homesteads and likewise different synthetic compounds in areas, for example, mining and development have contributed colossally to the generally decrease of water quality all around. Water is a basic requirement for human survival and consequently there must be instruments set up to overwhelmingly test the nature of water that made accessible for drinking around the local area and city verbalized supplies and in addition the waterways, streams and shoreline that encompass our towns and urban areas. The accessibility of good quality water is vital in averting flare-ups of water-borne maladies and alsoenhancing the nature of life[3]. Fiji Islands are situated in the immense Pacific Ocean whichrequires an incessant information gathering system for the water quality observing and IoT and RS can enhance the current estimation. This paper shows a shrewd water quality observing framework for Fiji, utilizing IoT and remote detecting innovation[4]. In numerous regards, cultivating and nourishment preparinghave slacked different enterprises with regards to appropriation ofinventive innovation[4]. Natural Gases: Water is a thin liquid without any color or taste when it is pure (or)A colorless, transparent liquid which will forms the seas, lakes, rivers, and rain and is important for living organisms. It can be used source for heating, cooking, and electricity generation[4].Natural Gas is a natural resource that occurs hydrocarbon gas mixture consisting of primarily methane.It is formed when decomposing plant and animal matter are exposed to intense heat and pressure under the surface of the Earth over millions of years.Natural gas is a fossil fuel are used as an energy source for heating, cooking, and electricity generation[5].Air is in Earth's atmosphere. Air around us is a mixture of numerous gases and residue particles. It is the clear gas in which living things can live and breathe. It has an uncertain shape and volume. Soils are intricate blends of minerals, water, air and endless living beings that are the rotting stays of once-living things.


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It shapes at the surface of land – it is the "skin of the earth." Soil is fit for supporting vegetation and is indispensable to life on earth[5]. Conservation of Water: Preservation of water implies a cautious and efficient utilization of water. We should moderate water as it is a valuable common asset. According to the united nations of water agency in 9years two thirds of the world populations will beliving in the stressed water conditions.Water stress means not enough water for agricultural, Industrial and domestic uses.There are four ways that people contribute it by withdrawing too much water from surface waters life from the aral sea for the past thirty years or withdrawing too much of water from underground aquafiers.Polluting water like with poor sewage systems or paper mill factories and finally overconsumption.After 9years out of 8million people 5million people will be under stressed water[5]. We have to increase the water withdraw by 50% in developing world and 18% in the rest of the world. There are 2million people are suffering with water scarcity.How to overcome this problem? There are simple things to overcome this problem after using water close the tap, we have to educate people about water and its usage. Government should promote the conservation of water by indicating the people in public places by giving an idea how much level was left and how to look after it[6]. In some of the cities they started offering the people water efficient shower heads for free they developed a small water-flow regulator so they can control some quantity of water.There is the need for level sensors and equipment which are deployed across the reservoirs and overhead tanks.This can be done using IoT.

It is to be noticed that dimension sensors are uncommonly structured sensors which can build up the dimension of water present in a tank/supply. This built up water level would then be able to be imparted to the focal servers which are sent with the end goal of compelling water preservation and administration. It further aides in deciding the measure of water utilization once a day and furthermore shows the dimension of water that is available in the supplies or tanks[7]. Conservation of Soil: Soil protection is the keeping of soil misfortune from disintegration or decreased fruitfulness caused by over utilization, fermentation, salinization or other compound soil sullying. Cut and-consume and other unsustainable strategies for subsistence cultivating are drilled in some lesser created zones[7]. Some of the Soil conservation practices are Contour farming, Terrace farming, No-till farming, Organic farming, Restore wetland, Wind breaks.

## II. INTERNET OF THINGS

It is the network of physical devices,vehicles,and other items embedded with electronics,software,sensors,and connectivity which enables these things to connect,and exchange data.The Internet of Things (IoT) is portrayed by ITU and IERC as a dynamic worldwidearrange establishment with self-structuring limits reliant on standard moreover, interoperable correspondence traditions where physical and virtual"things" have characters, physical characteristics and virtual personalities, use clever interfaces and are reliably organized into the information orchestrate. Over the span of the latest year. Telecom executives consider that Machine-to-Machine (M2M) and the Inter-net of Things are transforming into a middle business focus, uncovering basic improvement in the amount of related inquiries in their frameworks. Contraption fabricates e.g. concerning wearable contraptions anticipate a full new business divide towards amorebroad apportionment of the IoT[13]. These investigation results are right now supporting into headway, and a movement of sections are open, which could supportively be manhandled and updated by the market[8]. The Internet of Things may before long be an ordinary of every day life, with a huge number of articles interconnected. "Shrewd" gadgets, hardware, machines and foundation are making open doors for mechanization and for cooperation progressively[11]. The board will talk about potential advantages of the Internet of Things in different divisions and spotlight on the best way to assemble trust in this rising innovation, cultivate interoperability, and advance effective and boundless correspondence frameworks and administrations[8]. Success Factors: The Internet of Things (IoT) keeps on producing a colossal measure of energy in IT and business circles. Individuals are everything except winded over the open doors that are at our doorstep—and all things considered. The IoT speaks to a noteworthy development open door for organizations—one that CIOs should start seeking after now, while the segment is as yet creating. Relief of engineering framework divergences through a typical architecture structure for associated framework characteristics and interoperability. Layered Architecture:

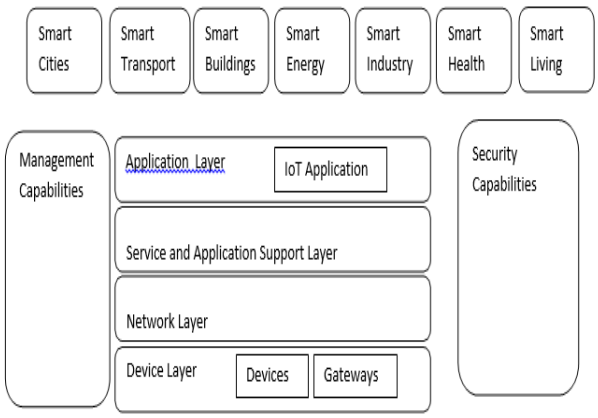


**Fig.1. IoT Layered Architecture**

Characteristics of IoT: 1.Interconnectivity: concerning the IoT, anything can be interconnected with the overall information and correspondence structure. 2.Things-related administrations: The IoT is fit for giving thing-related advantages inside the impediments of things, for instance, security protection and semantic consistency between physical things and their related virtual things[14] With the ultimate objective to give thing-related organizations inside the goals of things, both the headways in physical world and information world will change. 3.Heterogeneity:


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The contraptions in the IoT are heterogeneous as subject to assorted hardware stages and frameworks. They can interface with different devices or organization arranges through different frameworks.4.Dynamicchanges:The condition of gadgets change progressively e.g: sleeping what's more, arousing, related and additionally isolates and also the setting of devices including region and speed. In addition, the amount of contraptions can change logically. 5.Enormous scale: The amount of contraptions that ought to be managed and that talk with each other will be something like a demand of size greater than the device related with the present Internet.

## III. THEORETICALANALYSIS

Existing System: In this system the farmer will observe the soil whether it is dry or not.If it is dry then he turn on the motor after filling the field with water he will return again and turn off the water.The water will be wasted until the farmer returned to turn off the motor. It took so much of time. The energy conservation will be wasted and power will be wasted[9]. Proposed System:
This undergo with the sensors so that they calculate the soil moisture until it become lower .and it also calculate the pH value of the water so that the farmer will know how much water is acidic and how much water is in basic[12].After filling the field with water upto some extend the motor will set to be off and after turning off the motor the result will be send as a message to the farmer phone ,in that message it will show at what time the motor is turned off,andhow much level of water is filled by the field[9]. Equipment Interface: The Hardware interface module comprises of: Arduino chip, GSM modem,pHsensor,moisturesensor,and a motor these equipment will give an interface to the motor they will work as an given instructions Software interface module:
The product correspondence module is Arduino ide 1.8.3 software will be used for getting the perfect. It will execute the code and will get the result as given[9]. Arduino Uno (Component description): The Arduino Uno is a microcontroller board dependent on the ATmega328. It has 20 advanced i/p or o/p pins a 16 MHz resonator, a USB association, a power jack and a reset catch.

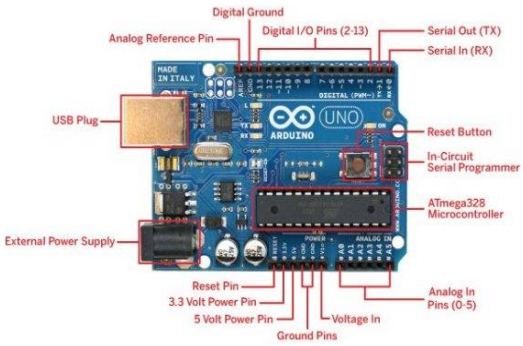


**Fig.2. Arduino Uno**

pH sensor:This sensor is used for finding the quality of water whether it is in acidic or basic in nature by finding the pH value of water.

**Fig. 3. pH sensor**

Moisture Sensor: Soil moisture sensors will measure the volumetric water content in the soil. Since the direct gravimetric estimation of free soil moisture requires expelling, drying, and weighting of an sample, soil moisture sensors measure the volumetric water content in a indirectly by utilizing some other property of the soil, for example, electrical resistance, dielectric constant, or cooperation with neutrons, as an iproxy for the moisture content.

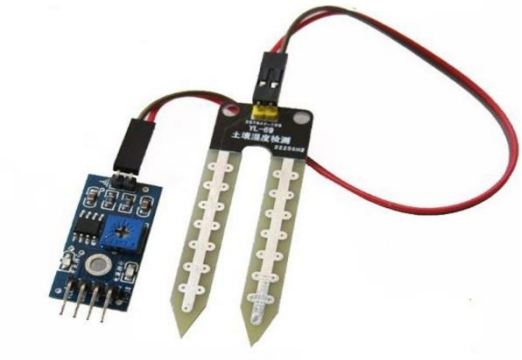

**Fig.4. Moisture Sensor**

Estimating soil moisture is essential for agricultural applications to help farmers to deal with their water system frameworks more productively. Knowing the correct soil moisture conditions on their fields, in addition to the not only the farmers to grow a crop with less water, they are likewise ready to expand yields and the nature of the harvest by enhanced administration of soil moisture amid basic plant development stages Mini Micro Submersible Motor pump:This motor is used to pump the water upto 3v to 6v

**Fig.5. Mini Micro Submersible Motor pump**

GSM module: GSM is a versatile correspondence modem; it is remains for worldwide framework for portable correspondence (GSM).


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GSM is an open and computerized cell innovation utilized for transmitting portable voice and information administrations works at the 850MHz, 900MHz, 1800MHz and 1900MHz recurrence groups[10].The computerized framework has a capacity to convey 64 kbps to 120 Mbps of information rates.

**Fig.6. GSM Module**

## IV. PROJECT HARDWARE AND IMPLEMENTATION

From the below block diagram moisture sensor is connected to the soil of the plant. pHsensor is kept on the water so that it can test the pH levels of the water whether it is soft water or hard water. Both pH sensor and moisture sensor are connected to the arduino uno so that it can be employed in that chip.Mini micro submersible motor pump is connected to Arduino so that it pumps water based on pH and Moisture sensor values. After getting values the message is send to the farmer via GSM module.

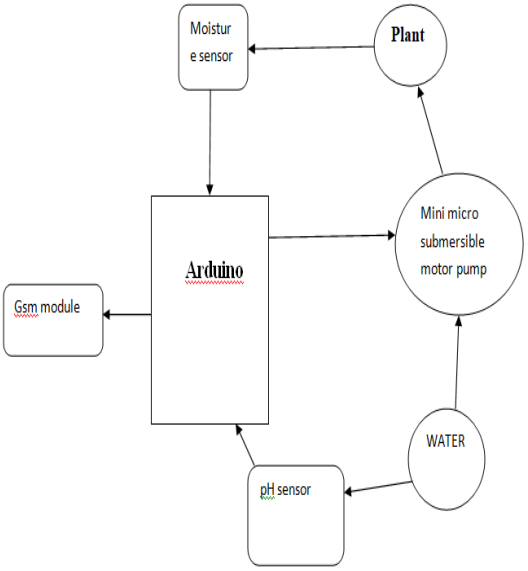


**Fig.7. Block Diagram**

## V. IMULATION/EXPERIMENTAL RESULTS

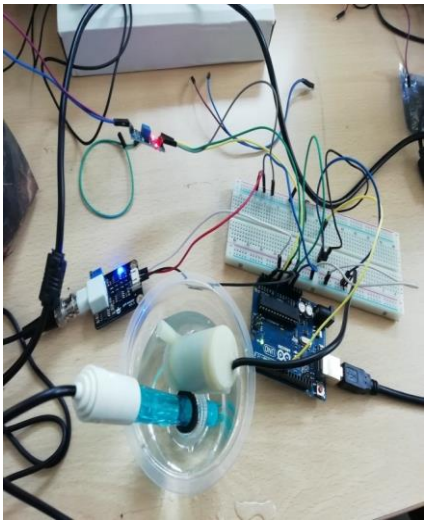

**Fig.8. Efficient UsageOfNaturalResources To Automation Of Agriculture Using IoT**

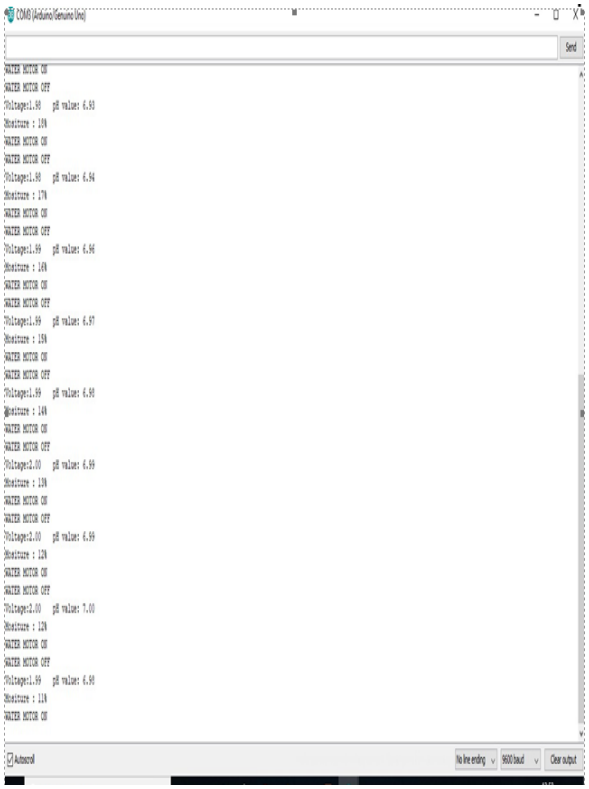

**Fig.9. pH and moisture sensor output**


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**Fig.10. pH and moisture sensor output**

## VI. CONCLUSION

In our proposed system, water can be used efficient manner, there will be no loss of water. It is a new way of farming IoT Technology. Due to this process the motor will work without any help of individual and make the farmers work simple. This experiment is not only used in agriculture but it can be also used in other factors.

This research is done by taking reference by from the other research papers. We can also save the water as it is important parameter for irrigation and for existence of life on earth. This system can be made more efficient by utilizing the best features of GSM Module like getting sms to the farmers phone and giving the intimation of the crop water level..

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