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Determination of Contamination Level in Water Using Ardunio

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ABSTRACT

This article investigates water quality monitoring systems through wireless sensor networks. Due to rapid development and urbanization, water quality affects year after year, leading to water shortages, and creating negative effects. Water plays an important role in human society and in India. 65% of drinking water comes from underground sources, so it is mandatory to verify the water quality. Monitoring water standards is a complex process as it has several laboratory testing methods and is time consuming. To overcome this difficulty, real-time monitoring of water wellness through the use of IoT has been proposed. Internet of Things along with GSM water meter and Sensor for efficiency, control water quality. Here we run a system to monitor water quality through different sensors - turbidity, pH, temperature, conductivity and water level as well. The controller accesses the information controlled by using sensors. The data accessed is controlled by the use of the Arduino controller. Using IoT, information gathered and water pollution can be considered, through strict mechanisms. In addition, the system alerts the public and their respective divisions or units about water. The environment can have good water adaptation.

Keywords: pH Sensor, Turbidity Sensor, Temperature Sensor, Ardunio Uno Module, GSM Module.

I. INTRODUCTION

Water is the fuel for all life and no life can be tested without water on this earth. Hazardous materials of various types are disposed of by drinking water and industrialization, globalization, urbanization, agriculture, and more. It is necessary to monitor water regularly using agile technologies. Based on our project, we ensure that water quality measurement is done automatically. The Central Pollution Control Board (CPCB) has put in place many monitoring bodies of water bodies in the country, which monitor the amount of water every month or year.

This is to ensure that the amount of water is stored at the desired level. And again, it is important that it be monitored daily. The requirements for pollution control and effective water pollution control measures are eliminated using water quality monitoring. The CPCB plans to improve the water quality monitoring network in the Ganga river basin. Both networks operate in real time and the central location can receive data from a number of channels

above using GPRS / GSM or 3G cellular processing. And the cost of the system varies depending on the components used.

Our described model includes different sensors that calculate the amount of water in real-time for action, and it is rich, transparent and requires effort. In this article, Part 2 focuses on the search for water quality monitoring while Section 3 discusses the Internet of Things. Section four discusses the procedure for the normal water monitoring system, and the results obtained through the system are discussed in Section 5. Section 6 concludes the document.

Tot there are 50 lakh public water wells in our country. Including unsigned water, total at 60 lakh Tested twice / year for bacterial tests. And once a year for chemical tests. According to NRDWP 120 lakh water samples for inspection / year. And a water analysis method was introduced in 1982, from 1988 to 1991 The substrate method was used to characterize the viral load. And in 1996, the epidemiological method was used to determine water quality, but in this way, many water-borne diseases were missing. And from 1995 to 2007, the prevalence estimated by BOD values below 3 mg / I was between 57 and 69%.

II. LITERATURA SURVEY

Rapid population growth will lead to depletion of available water resources and water quality. In addition, groundwater quality is contaminated with pesticides and fungicides. Indian rivers are polluted by industrial waste and untreated waste water discharges.

In 2013, Nivit Yadav, "CPCB Real Time Water Quality Monitoring Maintenance". In this method the quality of water in Ganges and Yamuna river is tested by using sensors. since they are the most polluted river in our country CPCB plans for analysing the water standards. And this method is more expensive

In 2007, Tuan Le Dinh, Wen Hu, Pavan Sikka, Peter Corke, L. Overs, Stephen Brosman, [4] "Design and Deployment of a Remote Robust Sensor" which gives a brief explain about the specialities and designing's of sensors.

In 2010, Quio Tie-Zhn [5] briefed the quality monitoring system based on GPRS/GSM. module collects and sends the data to monitoring centre through GPRS. It is an artificial method collection of data and other process will be done slowly

In 2003, Pavlos Papa Georgiou, [7] "Literature Survey on Wireless Sensor Networks", has analysed about the various wireless modes, configurations and networks. It analyses the protocols and layers in Wireless networks.

In 2011, Satish Turken, Amruta Kulkarni, [8] "Solar Powered Water Quality Monitoring System using Wireless Sensor Network", The Base station (BS) gathered information from distant remote sensors. The BS associated with ZigBee module was powered by sunlight baseboard (Energy harvesting).

In 2015, Liang Hu, Feng Wang, Jin Zhou and Kuo Zhao [9] "A Survey from the Perspective of Evolutionary Process in the Internet of Things", in this the new arrival and evolution in the internet is made clear to use the internet of things and the different techniques were explained.

In 2016, M N Barabde, [11] the System is used for determining the physiochemical factors of water quality such as motion, temperature, PH, conductivity, and oxidation lowering potential using ZigBee.

In 2016, Pavana N R, Dr. M.C. composed the water quality factors by investigating Wireless sensor networks(WSN) and by using the raspberry Pi module which is used with the Linux version.

III. BLOCK DIAGRAM

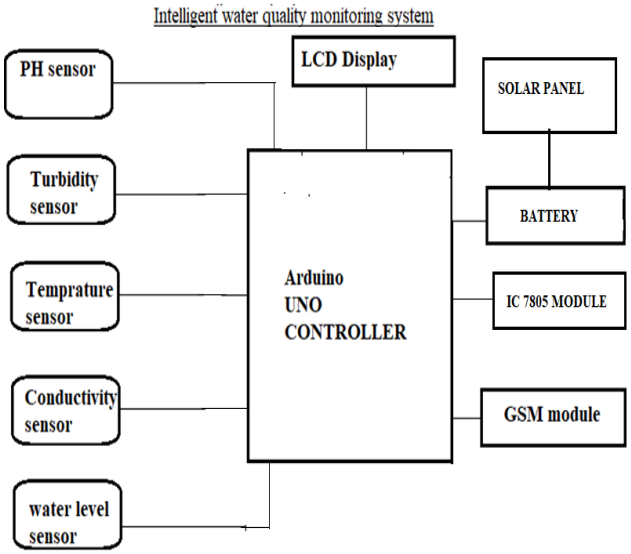

Fig 1. Block Diagram

A. *Implementation*

In this system, it uses four sensors (turbidity, temperature, pH, conductivity, water level) and an Arduino controller connected to the Internet of Things. Processor microcontroller model and GSM transfer drive. These four sensors capture data in analogue signals.

ADC converter that converts four signal data into digital format. The digital signals are transmitted to the Arduino controller, which is supplied with the transmission unit. The Arduino microcontroller looks at itself and executes digital information and the GSM module here is for the next channel communication, the GSM model sends the water quality factors to the smartphone as a text message. In this SMS, all the measured parameters are present in the application connection. Clicking on the link will get us all real-time parameter metrics. The LCD screen connected to the arduino also displays the same parameter measurements on each sensor. This way, the smart water quality control system works easily from a distance.

The Arduino microcontroller receives the data and processes the data that the sensors collect on the web through the GSM drive. The coding is used to perform the transmission.

This 12v 10w solar panel uses a complete solar system. The main purpose of this solar power is that it works in all remote environmental areas. And you send information remotely.

B. *System Design*

The water quality control system uses data such as pH, temperature, electrical conductivity (EC) and turbidity to obtain parameters. These water-based sensors analyse the quality of water resources. Certified content is used to predict water quality.

The analysed data is processed via the Arduino microcontroller and transmitted via the GSM / Wi-Fi module via the communication unit to the central server. By entering a user ID and a password, the user can view the information collected, processed, sent and analysed.

The data collected is displayed in real time. The Arduino microcontroller relies on real-time support for built-in track and simulation.

It also supports fast flash memory for the embedded system. Therefore, size is considered to be the most important requirement for using scalable applications and controlling access for consumers, so it is a good idea to use and consume less energy.

Solar energy is also used to coordinate the entire system in remote areas. That's why the idea is an intelligent water quality control system that uses solar energy.

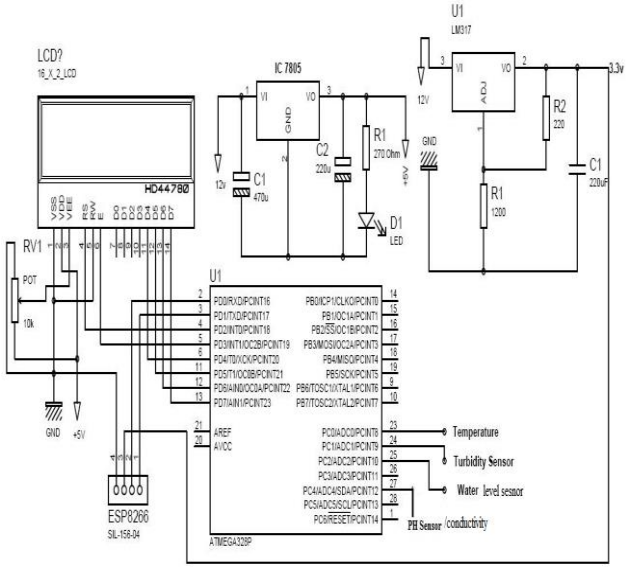

Fig 2. Schematic Circuit

IV. TECHNICAL DETAILS

In this proposed block diagram, several sensors (temperature, pH, turbidity, flow) are connected to the central controller. The central controller uses sensor values and processes them to transmit information over the Internet. Ardunio is used as a central controller. Sensor data can be viewed on the wi-fi Internet system.

A. *pH Sensor*

The pH of a solution is a measure of the acidity or alkalinity of a solution. The pH range is a logarithmic scale with a range from 0 to 14 and a neutral point of 7. Values greater than 7 indicate a basic or alkaline solution and values less than 7 indicate an acidic solution. It operates at 5V power and is easy to connect to an arduino. The normal pH range is 6 to 8.5.

B. *Turbidity Sensor*

The turbidity is a measure of the turbidity of the water. Cloudiness has shown the extent to which water loses its transparency. It is considered a good indicator of water quality. The turbidity prevents the light required for vegetation underwater. It can also raise the temperature of surface water above normal, because floating particles near the surface facilitate the absorption of heat by sunlight.

C. *Temperature Sensor*

The water temperature indicates that the water is hot or cold. The temperature sensor has a range of -55 to +125 ° C. This temperature sensor is digital and provides accurate reading.

D. *Electric Conductivity Sensor*

The salts dissolve in water in positive and negative ions. Dissolved ions are conductors and the ability of water to conduct a conductive current. The main positively charged ions are sodium, calcium, potassium, and magnesium, and the main negatively charged ions are chloride, sulphate, carbonate, and bicarbonate. Nitrates and phosphates are small charge ions for conductivity. The electrical conductivity is measured using a probe and a meter. The probe consists of two centimetres of electrodes 3 cm apart. (Units: millimetres - or micro-Siemens per cm). The concentration of the dissolved salt is directly proportional to the electrical conductivity. TDS conductivity in water is determined by multiplying by a factor of 0.67.

E. *Water Level Sensor*

Water level is one of the four parameters that the proposed system begins to value. To achieve this, we made a water level sensor to level connector wire, to the depth of the water. It can measure from 2 cm to

400 cm with a precision of can mm. There are 4 pins that can be connected in a different position. These are VCC (trigger), trigger (trigger), echo (receive) and GND (ground) pin. Like other sensors in the system, it requires V power. The amount of water and the level of water in the vessel are measured by the time taken to receive and electromagnetic signals from the trigger and the velocity (speed of light) of the electromagnetic waves. The velocity and time calculated by the microcontroller indicate the water level in the vessel.

F. *Solar Panel*

A solar panel is a collection of solar cells that can convert light directly into electricity. By combining the capacity of several solar panels, it is possible to cover part of the family.

Depending on the type of panel, between 5 and 19% of light energy can currently be converted into electricity. This is called the panel exit. As this technology is constantly improving, production should further increase.

With solar panels, you can convert free and inexhaustible sunlight into electricity. This conversion is carried out by the so-called "semiconductor" material from which each solar cell is produced.

A 12V-10w solar panel is used in this project. It can easily power the water quality monitoring system in remote areas of water resources.

V. ARDUNIO UNO AND GSM MODEM

Arduino Uno is a microcontroller based on ATmega 328. It has 14 digital I / O pins (6 of which can be used as PWM outputs), 6 analog inputs, 16 MHz crystal oscillator, socket, ICSP header and sleep button. It contains everything necessary to support the microcontroller; To get started, simply connect it to your computer with a USB cable, power it with an AC / DC adapter or battery. USB chip to serial controller. Instead, the Atmega 8U2 is programmed as a USB to serial converter. NOU and version 1.0 will be Arduino reference versions that will move forward. UNO is the latest in the Arduino USB family and the Arduino platform reference model. It manages the whole project activity.

A GSM modem is a type of specialized modem that receives a SIM card and acts as a subscription to a mobile operator, just like a mobile phone. A new version of SMS is available that supports the ability to use Android phones as a GSM modem to send and receive SMS and MMS messages. GSM is an open and digital cellular technology used to transmit mobile voice and data services that operate in the 850 MHz, 900 MHz, 1800 MHz and 1900 MHz frequency bands. Sends all information on the entry sensor to the primary authority. All sensor information is sent by SMS. This SMS contains a web link, if you click on this link, we will get the same information on the web page.

VI. CONCLUSION

The monitoring of turbidity, pH and water temperature uses a water detection sensor with a unique advantage and an existing GSM network. The system can automatically monitor water quality, is inexpensive and does not require service personnel. Water quality tests are therefore likely to be more economical, practical and faster. The system has good flexibility. This system can only be used to replace the corresponding sensors and modify the appropriate software programs to monitor other water quality parameters. The operation is simple. The system can be extended to include monitoring of hydrological pollution, atmospheric pollution, industrial and agricultural production, etc. It has wide application and extension value.

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