

ANALYSING WATER QUALITY OF AN AREA

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Abstract - In this paper, It is been discussed on how to analyze the quality of water. There are a lot of waterborne diseases spreading all over the world due to the drinking of dirty water. So to overcome this diseases this paper will help us to analyze the quality of water for drinking purpose and for the other variable uses which we do through water.”

Keywords – Water quality analysis, web based environment, monitoring, surface water, pH sensor, water level sensor, turbidity sensor, oxygen level sensor, power supply, Arduino Uno ATmega2560, google analytics, google cloud, web server, ESP8266 Wi-Fi module.

1. INTRODUCTION

Drinking water quality and availability are the most important issues. Monitoring of water quality and decision making on the data are challenging however attempts have been made to get the water quality index using parameter. Important source of water for human being comes from the source water bodies which is now under sever environmental stress due to development activities. So it is found that there are a lot of inventions been made in this 21st century but as in new-new inventions are been made across the world there are a lot of pollution, global warming, too been happening in this globe. While in India it is seen that there are a lot of diseases been occurred due to this unsafe consumption of bad water specially in Mumbai during the rainy season. This unsafe dirty water is harming to people so much that this water-borne diseases spreads inside the body very fast and takes a bit longer time to cure. And this diseases have been spread to many people across many such places. So this was been very difficult for municipal bodies and common people for how to check the quality of water that how much it is safe for drinking or not. So to overcome this problem this IOT system will help us to analyze the quality of water.

2. THEORY

Currently there are a lot of problems which are arising due to water-borne diseases such as the jaundice, diarrhoea, typhoid, cholera, filariasis, etc. The contaminants that use to be in unsafe water include microorganisms such as the protozoa, bacteria, viruses and the inorganic contaminants such as the metals and salts. Even there are organic chemical contaminants from industries areas such as the pesticides, petroleum, radioactive, petroleum contaminants. So basically water quality depends on the geology and the ecosystem as well as the human uses such industrial pollution, sewage dispersion, use of water bodies as heat sink and the overuse. Even at home some people forgot to close the tap and there is a lot of wastage of water been happened till the tap is been closed and that wastage of water could have been used in many other different purposes. So for this reason this sustainable IOT project is been made for sustainable use of water. The data set used in this study was generated through continuous monitoring of the water quality of the local areas. So with this we will get the real time data with accurate numbers which will help us in daily analysis.

3. OBJECTIVE

Water quality objectives are checked for specific bodies of fresh and coastal marine surface waters as segment of Environment's mandate to manage water quality. Because of this all the objectives are prepared only for those water quality characteristics that maybe affected by human work now or in the future. The main objective of this paper is to measure different values of water for safety of drinking of the animals and the humans. Water quality objectives are set to cover the most sensitive designated water use at a specific location. Designated water uses includes:-

- Raw drinking water, public water supply and food processing.
- Aquatic life and wildlife.
- Agriculture.
- Industrial water supplies.

4. ANALYSIS

To design the proposed water quality monitoring system, various water quality sensor, design, principles, wireless communication systems and water quality parameters were investigated. There was no such system present in local areas till date. And for checking the process it was done manually in laboratories. The main disadvantage was that people forget to close the tap or they don't know when the water will get full in the tank so they don't close the tap and then they might forget later to close the tap and water starts over flowing. So this water could have been used in several other purposes. So here is the comparative analysis table which shows for safe drinking of water what parameters should be there to match this crises for safe water drinking.

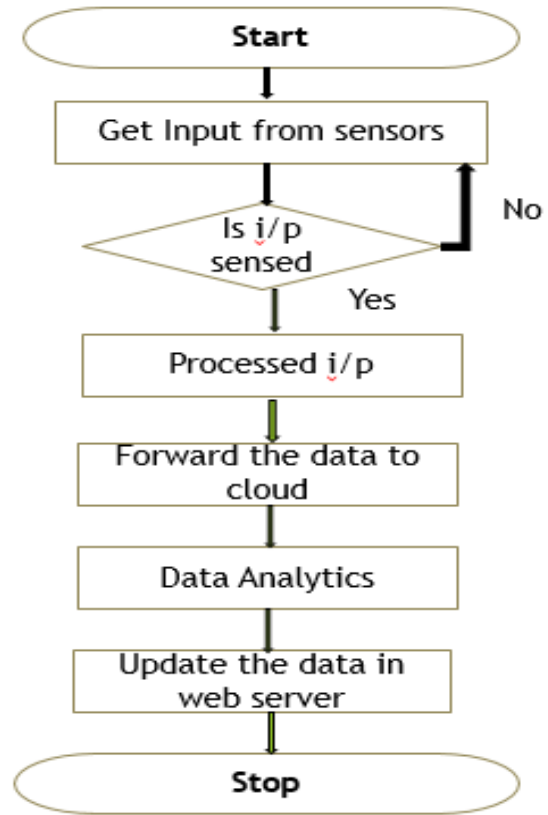
Parameter	Range
pH	6.5 - 8.5
Turbidity of water	>1 NTU
Oxygen level	6.5 – 8.0 mg/L

The pH of the water is of the most important factors when investigating water quality as it measures how basic or acidic the water is. Water with pH of 11 or higher can cause irritation to the eyes, skin and mucous membrane. Acidic water for drinking should range between 6.5- 8.5. The turbidity of water should be less than 1 NTU for drinking the water and the oxygen level in the water should vary from 6.5- 8.0 mg/L. So for the normal safe water for drinking should be in between this values which can't harm the bodies of anyone whoever who drinks this water.

5. METHOD

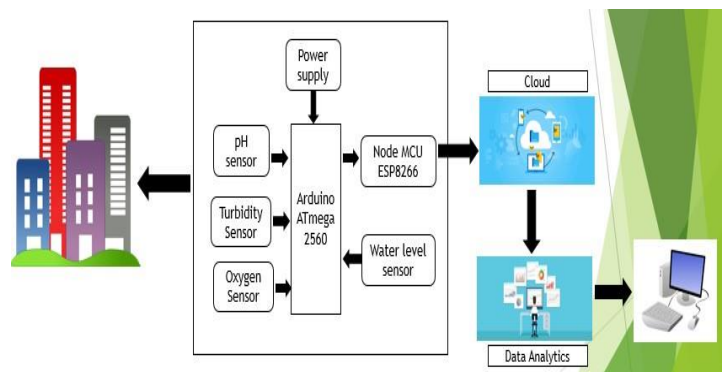
The first step was to determine which water quality parameters would be monitored for the assessment of the drinking water quality, to accurately determine whether the water quality is within the specified regulation of the World Health Organization (WHO). The water parameters which are the focus of this project are pH, temperature, turbidity of water, oxygen level. This physiochemical parameters can be used to detect certain water contaminations. Conductivity shows the indication of the amount of impurities in the water of how much clean the water is. Here is the basic flow chart of how the system gets work to

calculate the data for safe drinking of water. From this we can get how easily and speedily we can see the data from the web server from anywhere across the world.



So as the sensors gets the input from it senses the inputs and then it is processed and that inputs are then forwarded to the cloud. And from there the data analytics is done and that data is now been uploaded in the web server and from there the person is able to view the values of every parameters regarding of how the water is safe or not drinking or any other purpose.

6. PROPOSED SYSTEM DESIGN



As shown in the above system it is divided into four sub-systems. Out of the four sub-systems the first is sensing node, second is the measurement node, third is the wireless node and the last fourth is the notification node.

The sensing node contains all the water quality inputs taken by the sensors from the water and as well as the signal conditioning circuits required to interfere with the measurement node. Then the measurement node consists of a micro controller that processes raw sensor data and then it transmits that data to the wireless transmitter module. So to the information been came from the sensors. After when it's done the google cloud and data analytics uploads that data to the system. So now after this all the process we are able to see the values been calculated on the screen. So this was the proposed system on how the system going to get work on it.

7. LITERATURE REVIEW

There were several papers been researched for this project. In one of the project the system used was for metro-politian water supply but they used solar panel which can make the project costly. In another their main purpose was to identify the difference between the quality of water and rate of flow of the water but it had drawback that due to flow of water inside the pipe there might come some large particle which could get stuck on the sensor and can make the sensor work bad. One of those paper discussed about the solution for management of water in housing activities as well as it also facilitates the supervisors of societies to make adequate actions but due to the use of raspberry-pi the project could get more challenging and cost un-effective. As in one of the paper it mentioned that messages which comes from cloud will be sent from cloud to clients portal if value exceeds the brink and an caution message is sent to the user as to the government using an IOT but the main drawback was where to dispose the waste treated water so due to that the project might not grow much. So seeing many such drawbacks and seeing the advantages we grow up with this project which will definitely help you while making project.

8. RESULT & FUTURE SCOPE

So finally the project was been succeeded with several number of attempts. This system required various components such as the Arduino Ael sensor and then the power supply. So this were the hardware components required and the software components required were Arduino IDE, Google Cloud, Google Analytics, HTML, CSS, Django. So here if it gets possible to upgrade our system then we will definitely work on this. Just the

parameter should match the requirement and the motor will pump up the water in the tanks and this will reduce the man cost and man power as well by doing things. The current design is able to display the parameters in real time, however a history of the readings won't be available, thus data logging of the sensor measurements could also be considered.

9. REFERENCES

- Arnav Arvind, Rajtirtha Paul, Paurush Bhulania "Implementation of Water Quality Sensing System using Internet of Things"
- Vaishnavi V. Daigavane and Dr. M.A Gaikwad "Water Quality Monitoring System Based on IOT"
- Sathish Pasika, Sai Teja Gandla "Smart water quality monitoring system with cost-effective using IoT"
- Kaushik Gupta, Mandar Kulkarni, Manas Magdum, Yash Baldawa, Prof. Shivprasad Patil "Smart Water Management in Housing Societies using IoT"
- Sujay Dandekar, Shashank S Kadam, Ria N Choudhary, Sarthak S Vaidya, Vipul S Rajderkar "IOT based Real Time Water Grade Tracking System using Solar Energy"
- Abdul Rauf Memon, Saadia Kulsoom Memon, Abdul Aziz Memon, Tayab Din Memon "IoT Based Water Quality Monitoring System for Safe Drinking Water in Pakistan"
- Abdul Rauf Memon, Saadia Kulsoom Memon, Abdul Aziz Memon, Tayab Din Memon "IoT Based Water Quality Monitoring System for Safe Drinking Water in Pakistan"
- Jemy Joseph, Manju K M, Sajith M R, Sujith Nair, Vishnu P Viay, Sithara Krishnan "Water Management System Using IoT"