



pH based Water Environment Monitoring Using Continuous Search Algorithm

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Abstract— *It is the solution on the recent problem that occurring in the villages of India. The problem is drought. In India government had announced the condition of drought in many villages. The condition of drought is determined by identifying the certain level of water in wells. This all process is done by the officers allotted by government but as we know that India is most corrupted country. For the help of the people in such villages government gives some financial funds. Now the condition is that if in reality there are 50 wells drought. This corrupted officers gives wrong information that there 100 wells drought so, government gives money for 100 wells but as actually there 50 wells fund is utilized only for 50 wells. The remaining fund goes in officer's pocket. Here we can see, in between miss arrangement of government & officers, the loss are of only of villagers. They neither get water nor money. So to avoid this we built up a new idea that if we develop a system that detects the actual water level of drought and gives alarm direct to the government sector; that particular area's wells are drought then there will be ease for both government & villagers. Day by day It has been also observed that in India, the villagers are suffering from toxic elements of water. Water is our basic need & it is consumed by all of us. There are many dangerous diseases that happen due to toxicity of water such as fatigue, headache, irritability, skin pigmentation, lethargy, joint diseases, and loss of body hair, liver cancer, heart diseases, arthritis. These are the dangerous diseases which are killing many peoples. To avoiding this we are going to develop the system which will detect the level of water in wells & gives the result that water is harmless to consume or not & this result of toxicity is given to government sector.*

Keywords— *Water pollution accident, short term high dose exposure, predicted no effect concentration, Inorganic flocculent; Flocculation effects.*

I. INTRODUCTION

Water is mankind's most valuable resource, and one of the most important necessity for existence of human life. Regrettably it is often mixed with impurities such as organic and inorganic contaminants. Agriculture sector producing graphs, wheat, soya bean, cotton sprays maximum chemical fertilizers to gain more yield but no one thinks about then what happens when the same chemical gets drained into well water, underground water bore causing the water to become harmful in nature, in Maharashtra areas like nashik, chandrapure, wardha are most affected areas, over 75% of all infectious diseases are caused by water borne contaminants. especially in rural areas due to these it is found that the groundwater and surface water of lakes or wells which is used for drinking can be contaminated from many of the sources such as garbage dumps, toxic waste and chemicals drained out due to the use of pesticides and fertilizers used in farming, industries etc

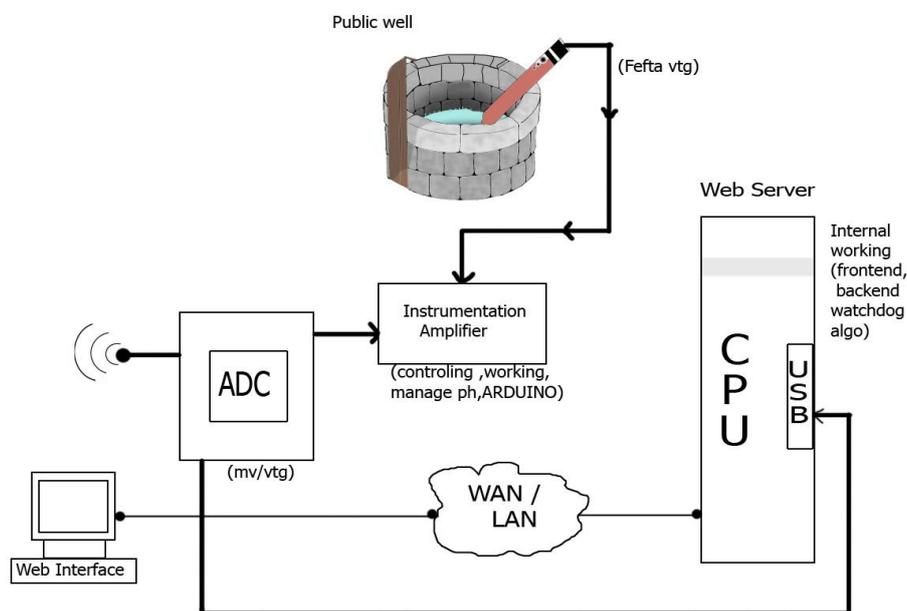
The another problem which make us to design this kind of system is the corruption that is done regarding the issue of water drought declaration in affected areas, govt has to release money and help packages to affected areas but always in our country we find false declaration even if no water drought. So many of the packages are looted by corrupt people. Cores of packages or development funds are taken from the government only under the name of water shortage; gram sevaks are managed by these people even that place is having enough water supplies.

All this issues can be handled using this system. In this system a ph electrode is used to check the ph value as well as the quality of water used for drinking (is the water is safe for consumption?). Also it detects the level of water storage which will indicate how much water is present there in that storage well and all this information will be calculated with the help of an data link card and will be directly provided to the central office of health and agriculture departments at ministry level. This two systems will be connected with the help of WAN or Internet connection. And in this way, the health ministers can monitor that the water is safe for drinking or not and also can measure the quantity of water available for that area. So hence no water drought declaration by old method can take place, here now simply from central ministry it can be declared and health warnings can be given by the health ministry. This system is a real time, web enabled system. These kind of system is need of today's world and especially of an agriculture oriented country like India [4] [8] [9].

A. *System scope*: A system can be used for "Irrigation pollution monitoring, industrial waste water monitoring, River pollution monitoring, well pollution monitoring and water tanks"[7].

- B. *User Classes and Characteristics:* There are no particular classes for users of this system, as this system provides mechanism of which any user can make use. The users can be an individual who wants to monitor the system. The user can be an administrator or client as well.
- C. *Operating Environment:* The environment in which the software and hardware operates. pH electrode has a limited life so it has to be periodically maintained. Environment do not affect it still work as same in every condition/situation.
- D. *Design and Implementation Constraints:* There is a particular set point (ranges from 0-7 and 7 above) for every pH electrode. Consumable water always indicate above 7 and in additional if it is greater than 9 then that water doesn't contain any harmful elements, but still water is not healthy for human being. Set point should be in 6.1 to 7 or max 7.9. It is the solution for all the muddy water, toxic water, leaded water etc. System job is to test the water and continuously generate the report and make sure to persons that if it is consumable or not?
- E. *Assumptions and Dependencies:* When the well is found drought then it will not produce any output which indicates the well is dried. When the water is present, pH electrode will test the water ionize it and produce the output on the server. As soon pH value crosses the set point it will generate an alarm and send messages on predefined numbers. The output of the pH electrode can be monitored on the server and it can be shown through histogram. This can be remotely accessed.

II. SYSTEM ARCHITECTURE



III. SYSTEM MODULES

A. *ph electrode:* ph electrode is a type of ion selective electrode made of a doped glass membrane that is sensitive to a particular ion. It is a measure part of the instrumentation amplifier for chemical analysis and physiochemical studies. Glass electrode are mostly used for ph measurement there are also specialized ion sensitive glass electrodes used for determination of concentration of lithium, sodium ammonium, chlorine and other ions[3].

The Basic ph value is 6.

B. *Instrumentation amplifier:* Its second module which is basically used for ph electrode is just a sensor which generates voltage in "mV". Mv is not sufficient to calculate so by using AD620 is much easier, it converts a mv to volts. If ph value is 1mv then instrumentation amplifier give minimum 100volts.

C. *Arduino:* As above information ph generates a fefta voltage so by using instrumentation amplifier. We generate a voltage by taking input of ph. Ardiuno is a circuit is for convert the output signal into digital form so system can use it to produce result. Instrumentation amplifier generated voltage so need to convert into digital form so by microcontroller ADC

IV. PROPOSED ALGORITHM

A. *Watchdog algorithm based on Binary search algorithm*

```
intbinary_search(int A[],int key,int min,int max)
{
//continue searching while(min,max) is not empty while
(max>=min)
{
//calculate the mid value for roughly equal partition
int mid=midpoint(min,max);
```

```

If (A[mid]==key)
//key found at index mid
Return mid;

Else if (A[mid]<key)
//change min value to search upper half
mid=mid+1;
Else
//change max value to search lower half
max=mid-1;
}
//keyvalue was not found
Return key not found
}[1]
B. System working flowchart:-
    
```

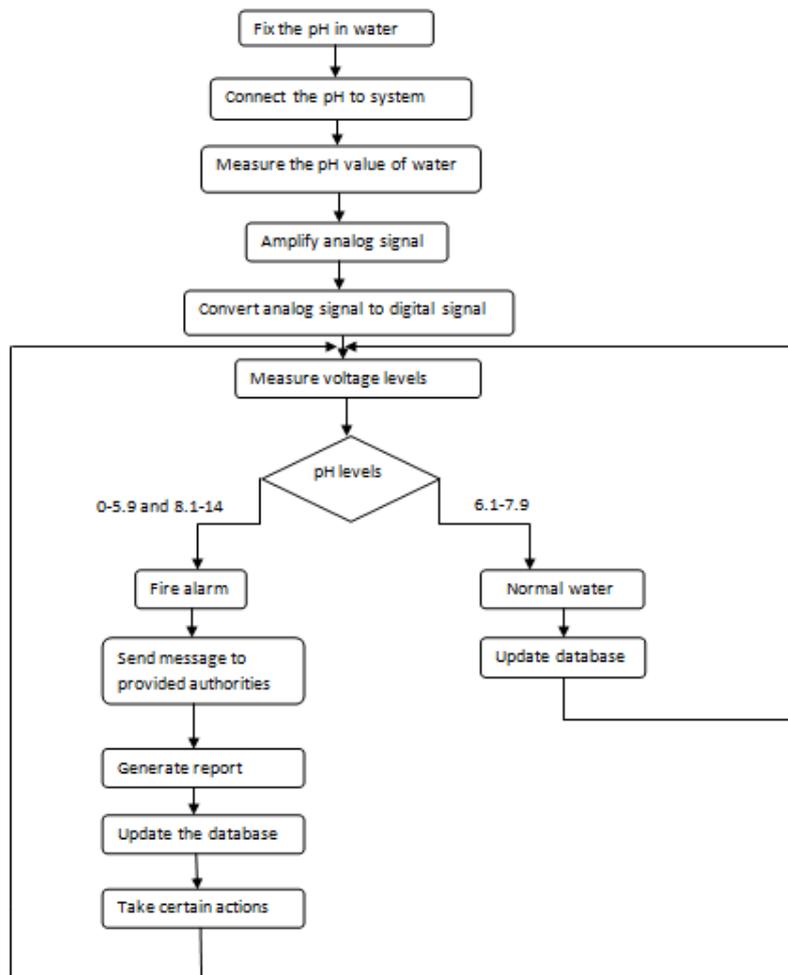


Fig I: System working flowchart

V. EXPERIMENT AND RESULTS

Table I Reading of Module I

Acidic (mV)	Neutral (mV)	Basic (mV)
1550	950	800
1497	955	793
1560	942	807

Table I shows the reading of the ph value on the multimeter in mile volts. If the value is in between 940mV-960mV then it is considered as Neutral. If the value falls below 939mV then it is considered as basic. And if the value exceeds 1490mV then it is considered as Acidic [1][2] .

Table II Reading of Module II

States	Reading	PH Levels
Acidic	26-45	<6
Neutral	10-26	6-8
Basic	Less than 10	>8

Table II shows the reading of the ph value measured via Arduino. If the value is in between 10-26 then it is considered as Neutral. If the value falls below less than 10 then it is considered as basic. And if the value exceeds 26 then it is considered as Acidic [1][2][5].

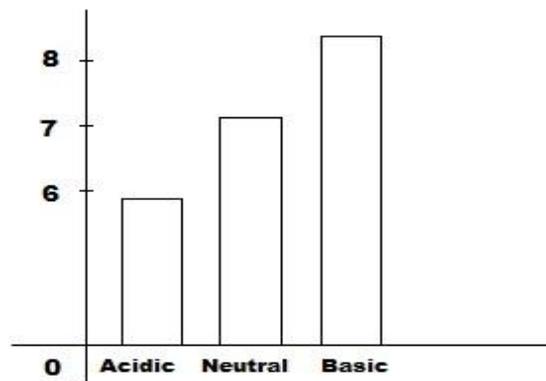


Fig II: pH levels

Figure II shows the pictorial representation of the above measured values of the pH.

VI. CONCLUSION

According to survey it has been found that India is most popular country in consumption of contaminated water Since there is no such automated way to measure the toxicity of water. Which has a great impact on society. So numerous disease are spreading in society, because of which society is getting disturbed and the human being are suffering from its causes. So we are trying to develop a system which can automatically measure the toxicity of water and allow the users to monitor it remotely. The system can allow user to monitor all this features of the system from a remote location, far away from where it has been fixed. By using this system the user can monitor the level of water present in the wells of the villages.

Now we are trying to develop a system which can measure the pH level of water. The level of hydrogen and ion concentration present in the water, with the help of pH electrode.

In future a system can be build, which can measure various other elements which are mixed in the water, such as lead, chlorine, fluorine, etc. with the help of various electrodes available in the market.

If such a system is developed, then we can surely be with nature and build a safety and healthy society.

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