

ARDUINO BASED WATER MANAGEMENT SYSTEM

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Abstract - Rain water harvesting is used to store the rainwater for any future purposes. By incorporating a smart water management system, Rainwater management will gain the ability to store the excess water in a smarter way by utilizing new technology, which deals with the modules like sensors, Arduino processors etc. In this project, the water flowing besides the roads gets into the filtration tank where it consists of five to six layer of natural filtration elements like sand, rock, gravels, and cloth sheets etc. The collected filtered water can be used for irrigation and different applications besides of our daily needs like drinking water and livestock. Instead of getting the water dirtied by overflowing of rainwater, it can be stored and used for irrigation and many other purposes like underground rock storage. By using the different sensors for different applications like water level, water turbidity, water PH level. The proposed model utilizes the rain water flowing on the roads in a proper way.

KeyWords: Water filtration, water PH, water turbidity , water level.

INTRODUCTION

With the rapid development of the economy, more and more serious problems of environment arise. Water pollution is one of these problems. Routinely monitored parameters of water quality are temperature, pH, turbidity, conductivity, dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia nitrogen, nitrate, nitrite, phosphate, various metal ions and so on. The most common method to detect these parameters is to collect samples manually and then send them to laboratory for detecting and analysing. This method wastes too much man power and material resource, and has the limitations of the samples collecting, long-time analysing, the aging of experiment equipment and other issues. Sensor is an ideal detecting device to solve these problems. It can convert no power information into electrical signals. It can easily transfer process, transform and control signals, and has many special advantages such as good selectivity, high sensitivity, fast response speed and so on. According to these characteristics and advantages of sensors, Monitoring of Turbidity, PH & Water Level is designed and developed.

1. HARDWARE REQUIREMENT

- Arduino UNO
- Ph sensor
- Water level sensor
- Water level sensor
- Connecting wires
- Breadboard
- LED
- Buzzer
- Water filtration levels

2. SOFTWARE REQUIREMENT

Arduino

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

3.EXISTING SYSTEM

In the existing system the water on the road side is just left into the sewer drains where the rain water and sewer water get mixed and cannot be used for any purpose. But in some case the rain water flowing on the roads are let into the rain water harvesting system.

4.PROPOSED SYSTEM

The proposed system consists of five sections like water filtration, filtered water, water level , water PH, water turbidity. After crossing these process the water can be used for consumption. The water filtration consist of layers of rock, sand, coal powder and cloth sheet. By using the different sensors for different applications like water level,

water turbidity, water PH level. The proposed model utilizes the rain water flowing on the roads in a proper way.

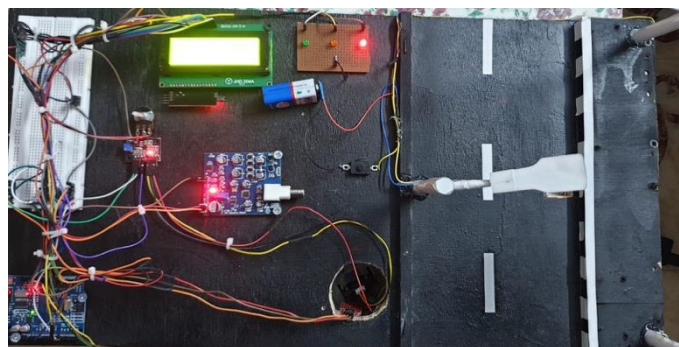


Figure 1. Proposed system model

5. LIST OF MODULES

Our proposed system is made up of these following.

Module 1: Water filtration

Module 2: Filtered water

Module 3: Water Level

Module 4: Water PH level

Module 5: Water Turbidity

MODULE 1:- WATER FILTRATION

This is the first section of the water management plant, the water enters into the filtration tank. In the filtration tank it consists of five layers of filtration elements like sand, rock, gravels, coal powder and cloth sheets. The filtration elements are placed between the filtration cloth for pure filtration.

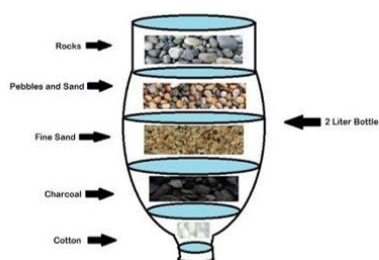


Figure 2. Water filtration

MODULE 2: FILTERED WATER

After the water from the filtration tank then the water reaches another tank where it stores the filtered water.

MODULE 3: WATER LEVEL

Water Sensor water level sensor is an easy-to-use, cost-effective high level/drop recognition sensor, which is obtained by having a series of parallel wires exposed traces measured droplets/water volume in order to determine the water level. In our project it is used to find the water level of the filtered tank.

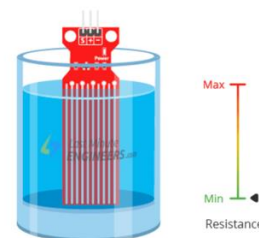


Figure 3. Water level sensor

MODULE 4: WATER PH LEVEL

PH is an important limiting chemical factor for aquatic life. If the water in a stream is too acidic or basic, the H^+ or OH^- ion activity may disrupt aquatic organisms biochemical reactions by either harming or killing the stream organisms. pH is expressed in a scale with ranges from 1 to 14. A solution with a pH less than 7 has more H^+ activity than OH^- , and is considered acidic. A solution with a pH value greater than 7 has more OH^- activity than H^+ , and is considered basic. The pH scale is logarithmic, meaning that as you go up and down the scale, the values change in factors of ten. A one-point pH change indicates the strength of the acid or base has increased or decreased tenfold. Streams generally have a pH values ranging between 6 and 9, depending upon the presence of dissolved substances that come from bedrock, soils and other materials in the watershed.

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Figure 4. PH level sensor

MODULE 5: WATER TURBIDITY

The gravity Arduino turbidity sensor detects water quality by measuring the levels of turbidity, or the opaqueness. It uses light to detect suspended particles in water by measuring the light transmittance and scattering rate, which changes with the amount of total suspended solids (TSS) in water. As the TSS increases, the liquid turbidity level increases. Turbidity sensors are used to measure water quality in rivers and streams, wastewater and effluent measurements, control instrumentation for settling ponds, sediment transport research and laboratory measurements. This liquid sensor provides analog and digital signal output modes. The threshold is adjustable when in digital signal mode.

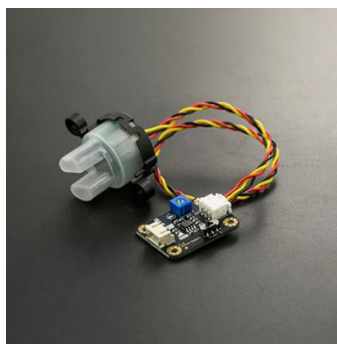


Figure 5. Water Turbidity

6.ADVANTAGES

1. Due to automation it will reduce the time to check the parameters.
2. This is economically affordable.
3. Low maintenance.
4. Prevention of water diseases.

7.FUTURE SCOPE

- By interfacing relay we controls the supply of water.
- To optimize the work to implement in Artificial Intelligence environment.
- Increase the parameters by addition of multiple sensors.
- Water management to connect with cloud.
- To give information to whole users those are depends on that plant.

8.CONCLUSION

Monitoring of Turbidity, PH & water level of Water makes use of water detection sensor with unique advantage .The system can monitor water quality automatically, and it is low in cost and does not require people on duty. So the water quality testing is likely to be more economical, convenient and fast. The system has good flexibility. Only by replacing the corresponding sensors and changing the relevant software programs, this system can be used to monitor other water quality parameters. The operation is simple. The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and so on. It has widespread application and extension.

9.REFERENCES

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