

Water Level Monitoring System

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ABSTRACT

The drinking water is one of the main problems affecting many countries now, in the same way we are not actually using the rain water properly. The misuse of water leads no many problems like uncontrolled water flow etc. Last year 2018 Kerala undergrown a deep flood because of huge rain due to that all the dams in Kerala opened simultaneously. It creates a huge flood in Kerala. Around 370 peoples died in Kerala due to this flood. The main reason is people are not aware of dam opening so the peoples near to the river all are washed off. Most of the dams are not having a digital sensing for water level. All the dams are having only scale measurement so failed to give information about damn opening. Water level monitoring system solves this problem It will give right information about water level in reservoir and it will avoid wastage water in tank.

Keywords : Node MCU(Microcontroller)Wi-Fi-Gateway, Water level Sensor, Relay, Buzzer.

I. INTRODUCTION

Water is essential for human beings and other organism so we have to give more care to water resources and avoid wastage of water. Nowadays some countries are suffering for water egg. Somalia and some African countries. Water is very precious; every single drop of water is very important. Water level monitoring is an IOT based system by applying this method we can reduce the amount of wastage water. Nowadays we can see in many houses once tank became empty they will turn on the pump for filling the water after that once tank is filled it reaches the maximum capacity it starts overflowing then only house owner understood the that the tank is filled then they will go and turn off the motor. All these things are happening in day today life. So much of water are wasting like this, so we have to reduce the wastage of water, we can save it for future.

Water level monitoring system will Evacuate all these problems. By using this project, we can save a

large amount of water and we can check the water level in dam or tank at any time any were in the world. We can operate the pump also whenever we need and it will be very useful in irrigation department. We are using gravity sensors in a water tank or a reservoir, it will give accurate information about the water level in the tank or a reservoir. In this project we can use a miniature water tank, Inside the tank we can install 3 gravity sensor one at low level, one at medium other sensor at top or maximum capacity of the water tank. We can use Node MCU Wi-Fi-gateway and some other equipment for this project. It is a IOT based system. Water is an universal solvent. Water is needed for everyday activities. In the most of the localities rain water is the most accessible source. Water plays an important role in our everyday life. Water source should be managed otherwise in future we will suffer for water. In some houses we can see wells and boreholes are used for filling water in tanks once tank is filled it starts overflow then they will turn off the motor so water wastage will occur. Water is essential for

everyday life a person in India consumes on an average 140 liters per day. In our earth the amount of water availability is 1.4 billion cubic kilometers in that 95% of water is in the oceans so the remaining amount of water is unfit for human consumption, only 1% of water is available only in river, pond, streams, lake and wells which is suitable for our consumption.

The aim of this paper is presenting our project Water level monitoring system based on IOT .One of the main motivation for this project is 2018 Kerala floods 370 peoples lost their lives and many other damages happened in the flood .By this project we will get a clear and accurate level of water in reservoir .In some cases water level is rising it will give a notification to us and we can prepare for that, we can give messages to peoples about the water level and we can give alert like yellow alert, Orange alert and when the water reaches the maximum level we can give red alert, so we can avoid future disaster. In another way we can implement this project in water tank to avoid the wastage of water and using IOT we can access the water level at any time and we can operate the water pump when the tank became empty and we can calculate the average time the water pump is used.by using this we can save a huge amount of water for future and it will give more financial gains and it will help the environment also.

II. METHODS AND MATERIAL

In [1], microcontroller to automated the process of water pumping in a over-head tank storage system is proposed It has the ability to detect the level of water in the tank. The pump will turn on/off accordingly. It will display the status in a LCD display. The automatic water level monitor is used in the study. It consists of the following major units: microcontroller, sensors display unit, pump and the core work of detecting the water level. It is done

By the comparator circuit for the further processing. The LM324 comparator, it is used to compare the inputs from the electrode. In the tank with a pre-set resistance and output at HIGH or LOW level with respect to the results from the comparison. The author is concluding by saying that this research has successfully provided an improvement on the existing water level controlling system. The use of calibrated circuit to indicate the level of water and the use of DC power instead of AC power thereby eliminating the risk.

The water level monitoring system [2] is designed here; it is on the basis electro mechanical system using in the digital technology. The electrical probes will be inserted into the tank and motor will starts pump the water, it goes down. The probes will detect the water level and turn ON/OFF the motor. The level controller is used here. The water sensor which will sense the low and high-water level in the water tank. If the water is level is low, the motor will start pumps the water ounce's it reaches the high level then it will stop to pump water. They were concluded by saying that the automatic water level controller is successfully designed and developed, most of the researchers have used the comparators for comparing the level of water in the tank. So, some have used NAND gate for comparing the water level. The use of resistors has also been noted in places where two levels of water.

The work done in [3] constructed an experimental setup, it consists of a motor pump when it is switched ON when the is about to go dry and it switched off when the tank is full and it starts overflow. In this metallic sensor are used. when the water reaches the sensors, the circuit gets completed and it will generate the signal. This signal is fed to the logic circuit to get correct and accurate signal. They have concluded by saying the system is very beneficial in rural areas and urban areas.it will help the efficient utilization of available water sources. If it is used on

large scale, it can provide a major contribution in the conservation of water for the future generations

In order to design and develop a water level monitoring System is to control of a pump for maintaining three levels of water in tank is constructed. The literature review and the total work carried out by other researchers is studied. After going through the previous detailed research papers, it helps to prepare a tentative design. The basic circuit diagram and working of the entire setup is discussed. A Complete view of the project is implemented in this circuit diagram. It shows all the connection of the project.

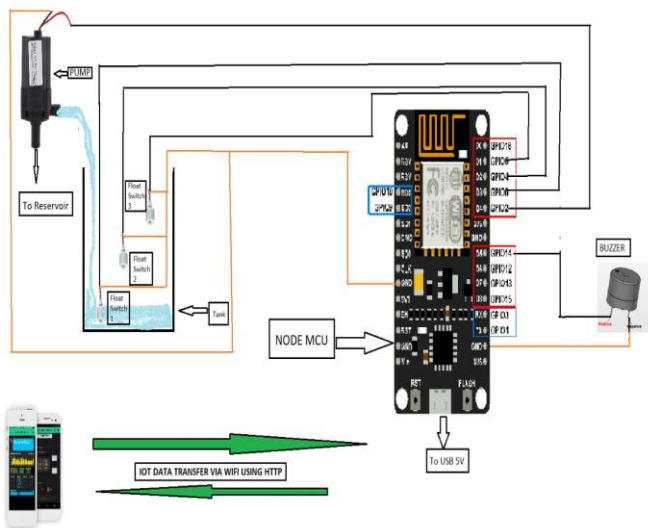


Fig 1 : Shows the circuit diagram of the water level monitoring system

Initially, when the water level in the main tank is below the lower level it will give a notification to the mobile water level is below 33% turn on the pump, so we can turn on pump using the mobile after it exceeds the 33 % it will show a notification. Once it reaches 99% it will send a notification in mobile and buzzer will turn ON So in that that we can turn OFF the pump.so whenever we want to operate the we can do ant anytime, we can check the water level also. The following components are used for the connection of the circuit.

- 1) NodeMCU(microcontroller)(ESP-8266) Wi-Fi gateway
- 2) Magnetic water level sensor
- 3) Miniature water tank
- 4) Water pump
- 5) Relay
- 6) Buzzer
- 7) Wires
- 8) LED
- 9) USB cable for power supply

The proposed system follows the following the diagram it will shows the flow of the program. Actually there are three levels of water are there at the low level, medium level and high level, the sensor will detect all of these things and it will they give the notification to the mobile that the water is in this level like that we can operate from our mobile, if the water level is low we can turn ON the pump. Once water is filled in the tank, we will get the Notification so we can OFF the pump.

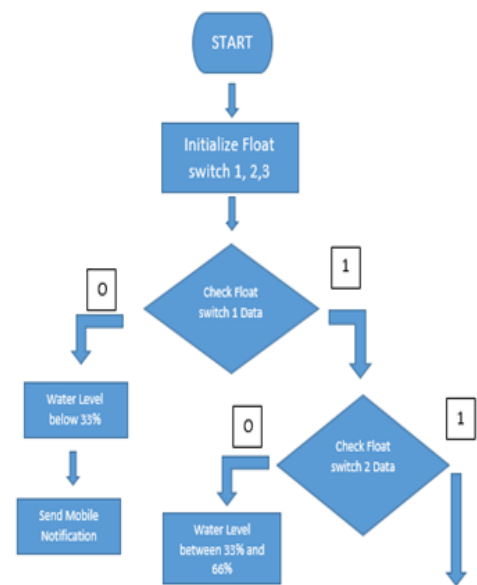


Fig 2 : Shows the flow chart case 1.

From the above flow chart, we understood that the flow of the water level monitoring system. In this at first it shows that it will initially check all the three-float switch. It has to check that all of them are working in a proper way. After that in this water

level monitoring system there are three level of monitoring systems are there all these three levels will indicate the water level so from this, we can verify the level of the water. In the tank there are three sensors are installed and all these sensors are connected to the circuit. It will give the correct and accurate information about the water level, so no need of rechecking is needed. Most of the dams are having manual checking for water level, by using this we can tell that all the information will get not 100% accurate so many problems will there in this type of manual checking. Each and every time can't go and check about the water level so it will create many issues.

By using water level monitoring system, we can avoid all these issues According to the above chart after initialize the float switch it will check the water level. if the water level is below 33% it will send notification that water is below 33% turn ON the Pump. If we are turn on the Pump it will also display the average Pump usage time so we can calculate how many hours Pump is used.

The below (Case 2) flow chart shows the working of the water level monitoring system. In this it will check the third sensor it is installed at the highest level of the tank if the water reaches the third sensor it sends a notification that the tank is full and the buzzer will beep once. In that time whether the Pump is ON it will sends a notification that the pump is on so please turn OFF the pump so we can turn OFF the pump by using our mobile phone. By using IOT (internet of things) we can control and monitor the water level at any part of the world at anytime we can access through our mobile phone.

The below flow chart shows when the water reaches the third sensor(99%) it will send a notification .If the pump is ON we have turn OFF the pump all these things we can access through at anywhere by using the benefits of IOT I t is very easy to access all these things using WIFI-gateway we will get the

notification .The below flowchart shows a detailed process of the project, by implementing this project it will make a new method of water consumption. Every single drop of water is very precious so we have to avoid all these kind of unnecessary wastage of water by doing this we can save millions of liters of water in the entire world it will give a new way for the coming generations also .We can teach the importance of water in human life, we can't survive without of water so it is very important so we have to save the water.

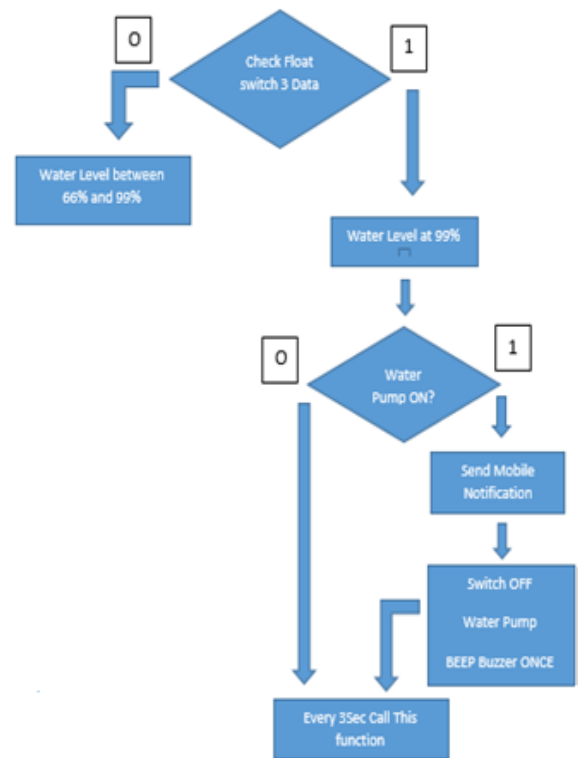


Fig .3: Shows the flow chart of the case 2

From the above chart it shows that at first it will initiate the 3 levels, all the 3 levels mean each sensor will there at each level .at the first level is in 33%, second level is in 66% and third level is in 99 % so all the three levels will be initiate first. After that it will check the water is in which position first position, second position or third position so it will check all the position. if the water is in the first position (33%)

it will send a message/notification to the mobile that water is below 33% turn ON the motor, like that all the three levels it will send the notification. If water level is in 99% it will send a notification and buzzer will beep. Once it tells that tank is full and the tank becomes empty also it will produce a beep sound and it will indicate tank is empty. When the tank is full it will a notification that tank is full turn off the motor, by using mobile we can operate the motor and we will get the information at any time anywhere in the world.

III. RESULTS AND DISCUSSION

For achieving the objective of water level monitoring system all the connections should be proper. there are 3 magnetic sensors are there in a miniature water tank one at 33% 66% and 99%. when the water reaches below 33% the buzzer will turn on and we will get a notification that tank is empty turn on the motor. We can ON the pump by using our mobile phone. Once we turn on the motor it will start pump water into the tank once it crosses 66% again it will give a notification the it reaches 99% buzzer will on give a notification tank id full turn off the motor, like this we can control the wastage of water and we can operate the motor at anywhere at any time.



Fig 4. Top view of the water level monitoring system.

From this figure we can see the components of the water level monitoring system. We can see miniature

water tank in this water all the three sensors are fixed. All the three sensors are connected to the circuit. Wi-Fi-gateway will give data to our mobile. In this we can see a pump.

that pump is used to pump the water to the tank. The top view of the water level monitoring system will show all the components and circuit of the system.



Fig 5. Side view of water level monitoring system.

From this figure we can see the side view of the water level monitoring system, near to the miniature water tank we can see the circuit, In the circuit it consists of relay, Node MCU, Wires, LED, Buzzer and other components.

The buzzer will beep once when the water in tank becomes empty and water in tank become highest position.so we get the correct information at any time. We don't want to spend time for looking the level of water and all automatically it will give the information.

IV. CONCLUSION

The experimental set-up of monitoring the water level is designed and developed successfully. Nowadays the wastage of water we can see everywhere, so we have to control all these things by using new methods otherwise wastage of water will increase day by day. In this experiment the water level monitoring design successfully by using Node

MCU (microcontroller)Esp-8266, relay, buzzer and other components. Water level monitoring system has been introducing to monitor the water at (low level, medium level, high level) All these level when water reaches we will get the notification so no need of looking manual, automatically it will give the notification and all the information will be accurate .by using this project it will help many rural and urban areas and we can reduce the wastage of water in both the area like that we can save water for our future.

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