SMART WATER MANAGEMENT

INTRODUCTION:

Smart Water Management is the activity of planning, developing, distributing and managing the use of water resources using an array of IOT technologies which are designed to increase transparency, and make more reasonable and sustainable usage of these water resources. The main goal of smart water is to ensure that the resource is being managed effectively by using data to help inform decisions. For example, they can use IOT systems to check water quality and identify contamination before it becomes hazardous.

PROBLEM STATEMENT:

Water issues in developing countries include scarcity of drinking water, floods, the siltation of river systems, as well as the contamination of rivers and large dams Millions of people in low- and middle-income countries receive water through intermittent water supply for drinking and domestic purposes. In intermittent water, supply water gets contaminated most of the time because of the following reasons

INNOVATION:

Smart Water Monitoring and Management Systems, based on the combination of sensors, big data and AI technologies, can provide to water utility operators, farmers and companies the ability to measure, monitor and control their water distribution networks as well as the quality of the water distributed. In this blog, I will explain, Importance, steps involved, its types, examples with risks and solutions involved in the smart water system innovation process

COMPONENTS OF SMART WATER MANAGEMENT:

• Monitoring water quality to fight pollution and diseases.

• Manufacturing and other human activities can be responsible for polluting rivers and the groundwater table.

• Sensors and IOT technology for real-time monitoring and control can help monitor and prevent pollution and even improve the water quality.

WATER LEVEL MONITORING:

1. PH Sensor

2. Arduino Mega

3. ESP8266-01 WIFI Module

4. Temperature Sensor

5. Ultrasonic Sensor
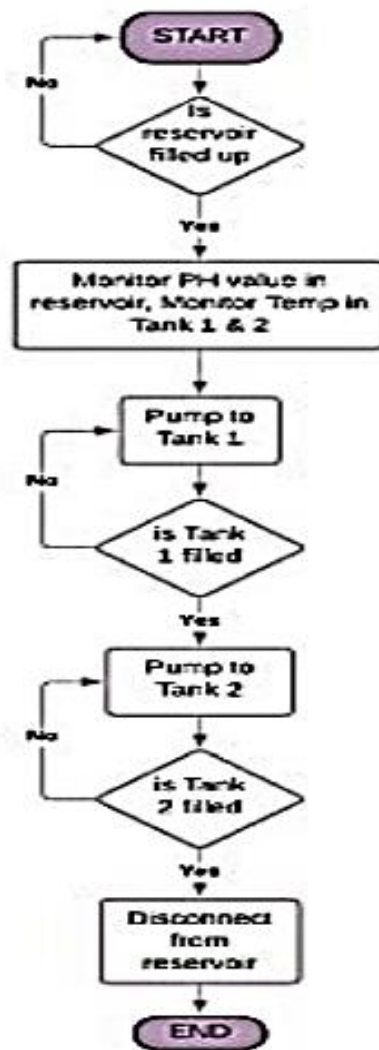
1. PH SENSOR:
   The pH sensor is calibrated to get the correct value by simply dipping it into a drinkable water, the pH of a natural water is supposed to be 7, if it is not, the we have to set the values y rotating the pin on the Analogy to digital converter of the sensor.

2. ARDUINO MEGA:
The Arduino Mega board is an open-source microcontroller board working based using Atmega2560 chip. It is the brain of the system. All the analogy and digital input and output pins are connected to the Arduino.

3. ESP8266-01 WIFI MODULE:

 ESP8266-01 is a low-cost Wi-Fi microchip. It is used to connect the Arduino board to a Wi-Fi network and establish internet connection, when the internet connection is established; the data can set from the Arduino to the cloud or ay platform being used to visualize the data.

4. TEMPERATURE SENSOR:

This DS18B20 seal type temperature has a 9 to 12-bit temperature readings (adjustable) over a 1-Wire interface, allowing us to use only one wire (and ground) that needs to be connected from a central microcontroller. We used this to measure the temperature of the water to know the degree of hotness or coldness of the water

5. ULTRASONIC SENSOR

The Ultrasonic sensor HC-SR04 uses sound waves to detect distance of object by measuring time spent for the object body to reflect the ultrasonic sound waves emitted by it.
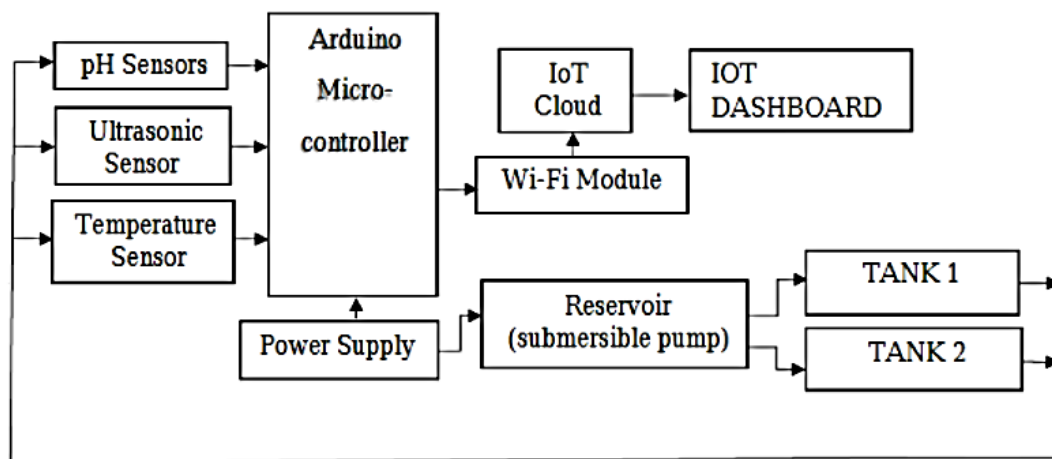
DESIGN:

 The designed system is used for water monitoring and checking the quality of water. Initially, sensor in the base tank checks for the presence of water. In the presence of water, pump starts automatically and it starts pumping water to overhead tank.

 Overhead tank is monitored for different water levels. Once the water reaches the threshold specified, it notifies the user. If the water level reaches the maximum threshold, pump stops automatically.

 If water is flowing continuously than the expected time then it will be detected by water flow sensor and data will go to IOT server.

 Smart water tank system is used for water monitoring and checking the quality of water. In storage tank and overhead tank, water level sensors are placed.

 Sensor in overhead tank is used to detect presence of water. If there is no water present in storage tank the motor automatically stops.

pH sensor is also inserted to check the quality of water. In overhead tank, three sensors are placed indicating three levels in the tank. If water reaches the top of tank, motor turns off automatically

On top of storage tank pi camera is placed. If any object found inside the storage tank pi camera is used to take images. Pi camera is also been interfaced with the raspberry pi kit.
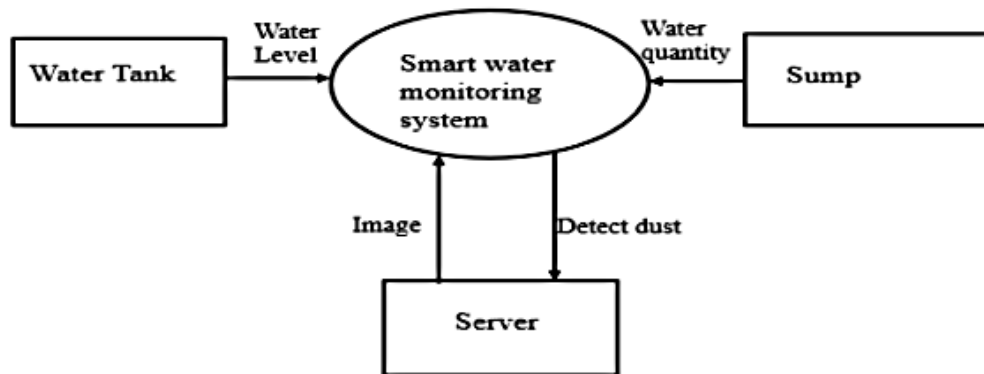
CONCLUSION:

The changing technology of water distribution and wastewater management will transform the work of local providers. The process begins by examining the current system for potential weak spots. An experienced water technology team will then offer strategies and equipment for improved performance and streamlined data gathering, management, and analysis. Data flowing through smart water systems will help water companies improve their current services and handle future challenges