River Health Monitoring System

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Abstract- *Rivers are the most important aspect in terms of water ecosystem , water source for nearby areas and businesses .But in current situation rivers are getting polluted because of increasing industrialization , dumping waste and low maintenance of water bodies The Government of India has been are always coming with projects like cleaning river ganga worth 80,000 crores, but what about small scale river bodies cleaning project , if we calculate the budget is to high for cleaning processes In this project we aim to reduce the cost of river cleaning processes by analyzing and monitoring the current situation of water quality and providing only that processes which actually need.So we can save our time and money by not using other processes which are not required or needed.*

I. INTRODUCTION

Currently potable water is becoming scarce.Water - quality monitoring is used to alert us to current,ongoing,and emerging problems; to determine compliance with drinking water standards,and to protect other beneficial uses of water.Water is an essential commodity for humans and agriculture.Hence it is necessary to continuously monitor the different parameters of the river so as to judge its health.The project's objective is to strengthen India's approaches to improving river conditions through developing and applying advanced methods for monitoring river health,estimating environmental flows and translating that to policy approaches. The broader aim of the project is to develop a consistent national approach to river health assessment. The project involved trialling international approaches to river health and environmental flow assessment.The assessments analysed and interpreted newly collected and existing data sources relevant to the ecological health of the pilot sites. Based on the results of this work, the project was able to comment on the current health of the pilot rivers, and make recommendations for future monitoring programs and other management actions. The final stage of the project will involve making recommendations about the options for developing and implementing a river health monitoring program for wider use in India, based on the results of the sensors used. River Health Monitoring, Assessment and Applications This report documents approaches to river health monitoring and assessment and outlines the key steps and issues involved in developing a river health-monitoring program. This report includes detailed background information for the project.

II. PROBLEM STATEMENT

It is necessary for monitoring the health of the river water time to time as it is consumed by the living beings such as humans,animals and also used in agriculture.So for monitoring the health of the river time to time, it is necessary to develop the system which can perform this activity.The developed system should be automatic in which less human supervision should be required.

III. AIMS AND OBJECTIVES

The main aim of our project is to develop a portable remote river health monitoring system which can measure the parameters and send this data wirelessly to a central data unit for further analysis

Objectives:

- We are going to measure Turbidity of river water.
- And also the location from which the sample is taken.
- And all this data will be collected and used for further analysis.

IV. PROPOSED SOLUTION

Turbidity is the measurement of water clarity. Suspended sediments, such as particles of clay, soil frequently enter the water from disturbed sites and affect water quality. We have planned to develop a system in which the suspended sediments can frequently enter the water from disturbed sites and affect water quality.

SENSOR 1: TURBIDITY SENSOR

Circuit diagram for Turbidity.
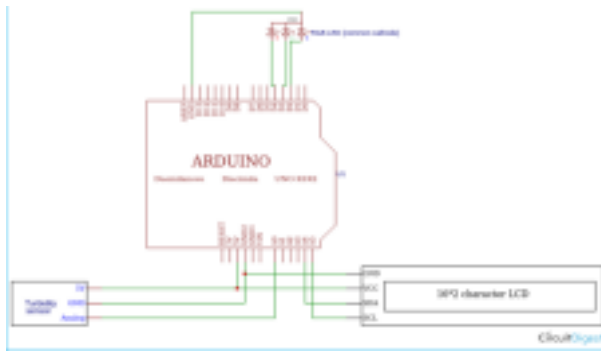
Programming Arduino to Measure Turbidity in Water.
Sensor Details:

Size: 38mm*28mm*10mm/1.5inches *1.1inches*0.4inches.
Output: Analog output:
0-4.5V.Digital Output: High/Low level signal.
Accuracy: 2% of reading or 1 mg/l (whichever is larger) for mud.

Turbidity can affect the taste and odor of drinking water. It is essential to reduce the turbidity of water in order to effectively disinfect it. Turbidity Sensor can act as a shield to pathogens and the particles that cause turbidity can harbor bacteria and viruses.

```
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 2, 16);
int sensorPin = A0;
void setup()
{
Serial.begin(9600);
lcd.begin();
pinMode(2, OUTPUT);
pinMode(3, OUTPUT);
pinMode(4, OUTPUT);
}
```

```
void loop() {
int        sensorValue    =       analogRead(sensorPin);
Serial.println(sensorValue);
int turbidity = map(sensorValue, 0, 750, 100, 0); delay(100);
lcd.setCursor(0, 0);
lcd.print("turbidity:");
lcd.print(" ");
lcd.setCursor(10, 0);
lcd.print(turbidity);
delay(100);
if (turbidity < 20) {
digitalWrite(2, HIGH);
digitalWrite(3, LOW);
digitalWrite(4, LOW);
lcd.setCursor(0, 1);
lcd.print(" its CLEAR ");
}
if ((turbidity > 20) && (turbidity < 50)) {
digitalWrite(2, LOW);
digitalWrite(3, HIGH);
digitalWrite(4, LOW);
lcd.setCursor(0, 1);
lcd.print(" its CLOUDY ");
}
if (turbidity > 50) {
digitalWrite(2, LOW);
digitalWrite(3, LOW);
digitalWrite(4, HIGH);
lcd.setCursor(0, 1);
lcd.print(" its DIRTY ");
}
}
```

SENSOR 2 : GPS(GLOBAL POSITIONING SYSTEM) SENSOR

Sensor Details :
Size: 25 x 35 mm
Supply Voltage: 3V-5V
Output: Maximum DC current at any output is 10mA.

GPS sensors provide us with accurate location information. So, that's why we can easily trace it from anywhere.Basically we know that GPS sensors are receivers with antennas which use a satellite -based navigation system which provides position, velocity and timing information.

Circuit diagram for GPS.

Programming Arduino to Measure GPS in Water.

```
#include <LiquidCrystal.h>
#include <SoftwareSerial.h>
#include <TinyGPS.h>
float lat = 28.5458,lon = 77.1703; // create variable for
latitude    and    longitude    object    SoftwareSerial
gpsSerial(3,4);//rx,tx
LiquidCrystal lcd(A0,A1,A2,A3,A4,A5);
TinyGPS gps; // create gps object
void setup(){
Serial.begin(9600); // connect serial
//Serial.println("The    GPS    Received    Signal:");
gpsSerial.begin(9600); // connect gps sensor lcd.begin(16,2);
}
void loop(){
 while(gpsSerial.available()){ // check for gps data
 if(gps.encode(gpsSerial.read()))// encode gps data
 {
 gps.f_get_position(&lat,&lon); // get latitude and longitude
 // display position
 lcd.clear();
 lcd.setCursor(1,0);
 lcd.print("GPS Signal");
 //Serial.print("Position: ");
 //Serial.print("Latitude:");
 //Serial.print(lat,6);
 //Serial.print(";");
 //Serial.print("Longitude:");
 //Serial.println(lon,6);
 lcd.setCursor(1,0);
 lcd.print("LAT:");
 lcd.setCursor(5,0);
 lcd.print(lat);
 //Serial.print(lat);
 //Serial.print(" ");
 lcd.setCursor(0,1);
 lcd.print(",LON:");
 lcd.setCursor(5,1);
 lcd.print(lon);
 }
 }
String latitude = String(lat,6);
 String longitude = String(lon,6);
Serial.println(latitude";"+longitude);
delay(1000);
}
```

REFERENCES

[1] Rao, K.L, (1979),India's Water Wealth Its Assessment, Uses and Projections, Orient Longman, New Delhi, pp.39-70. • Central Pollution Control Board,2003, Water Quality in India Status and Trend(1990- 2001),New Delhi,MINARS/20/2001-2002,pp. • Central Board for the Prevention and Control of Water Pollution,1979, Scheme for Zoning and Classification of Indian Rivers, Estuaries and Coastal Waters (Part One: Sweet Water) New Delhi,ADSORBS/3/1978-79, pp. 1-19.

[2] Y. Sharma, Richard Helmer & Lvanildo Hespanhol ,case study I-The Ganga,India,United nations environment programme,water supply & sanitation collaborative council and world health organization WHO,1997.

[3] Mr. P. M. Sirsat, "Design and fabrication of River Waste Cleaning Machine", IJCMES, ISSN: 2455-5304, 2017

[4] Ganesh Khekare, Urvashi Dhanre, "Design of Optimized and Innovative Remotely Operated Machine for Water Surface Garbage Assortment", IJCSE, January 2019

[5] Tejpal Parshiwanikar, "Design & Fabrication of Automatic River Cleaning System", JETIR, ISSN:2349-5162, Vol.6, Issue 5, page no.14-17, May-2019

[6] IoT Based Real-time River Water Quality Monitoring System.Mohammad Salah Uddin Chowdhury, Talha Bin Emran The 16th International Conference on Mobile Systems and Pervasive Computing (MobiSPC) August 19-21, 2019

[7] Mohammad Ziaul Hoque.French, G.T (1996): An Introduction to the Global Positioning System- What it is and how it works, Geo Research INC, Bethesda, pp 3-221.