XBEE based Flood Alert System

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Abstract— The main objective of this project is to give an alert signal to the people who are living nearby to the river bank during dam water releasing. At present the alert signal given from the dam is not reachable to the people living in the nearby villages. Hence they use the river without knowing about dam water releasing and lose their life. This project can be used to prevent human life by giving an alert signal about dam water releasing to panchayat office of each village nearby river bank regions. This project consists of XBee RF (Radio Frequency) transmitter and receiver modules (XBee series 2 modules will be used in this project which can communicate up to 120m. For real time implementation, XTend RF module can be used which can communicate up to 40miles), a microcontroller and buzzer. When the stop gate of the dam is opened, a signal will be transferred from the XBee RF transmitter. When the signal is received at the XBee RF receiver of the village, the microcontroller will turn on an alarm immediately in order to alert the people of the village. Multiple RF XBee receivers can be used to alert the people of different villages at the same time. This project can be used to avoid human loss completely. This project can also be used for mine monitoring.

Key words: XBee Transmitter and Receiver, Radio Frequency, PAN ID, Buzzer

I. INTRODUCTION

The main problem faced by the villages that are present near the dams are that the people don't know when the dam water is opened. In some cases when people don't know that accidents are happened. So there must be some security or alert systems that is capable of making all the people about the releasing of water from the dam and to make the corresponding arrangements. Our project results in giving an alarm to the people living in that villages. Due to this alert, the accident will be reduced. If the people won't get the alert signal, there will be a chance of accident. Accident cause many people to die and sometimes it causes someone to injure. This will give proper alert signal to the people who live throughout the water flow. Hence by using this, the people's lives will be saved.

II. STUDIES AND FINDINGS

Programming is done by using arduino software and configuring is done by using x-ctu software. XBee can communicate by configuring transmitter xbee as a coordinator and receiver XBee as a router. Transmitter XBee can communicate to receiver XBee by configuring both XBee in same pan id. A relay is an electrically operated switch that can also be used.

- Micro controller- An Arduino UNO board ATmega328 Microcontroller can used.
- Module - The XBee Series 2 RF (Radio Frequency) Modules were engineered to operate within the ZigBee protocol and Voice module ISD 1820 is used to store voices and play it.
- Sensor & Display - HC SR- 04 Ultrasonic sensor and Liquid Crystal Display can be used.
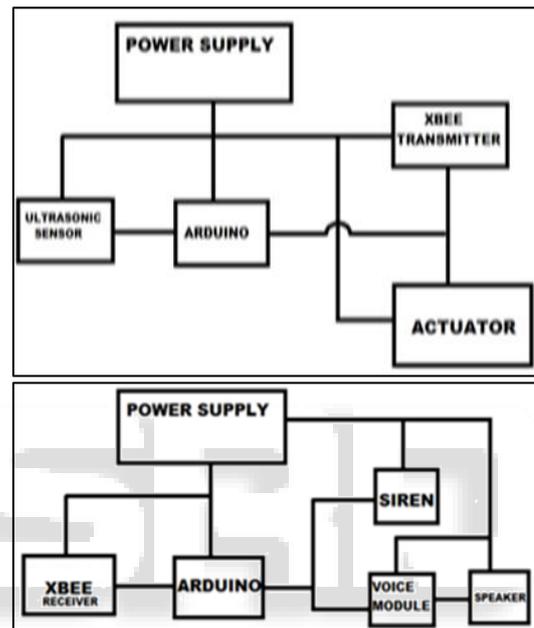
III. BLOCK DIAGRAM

A. Transmitter Side

Fig. 1: Transmitter Side

IV. IMPLEMENTATION METHOD

The XBee RF transmitter and receiver are used here. XBee transmitter is placed in the dam. XBee receiver is placed in the panchayat office. This project consists of the ultrasonic sensor that monitors the water level in the dam. If the water reaches the certain level, a signal is generated and send to the arduino. The arduino sends the signal to the XBee. The XBee sends the character to the receiver XBee with the same PAN ID (Personal Area Network Identification). After 4 seconds time delay, dam gate will be opened. When the receiver XBee receives the signal, it sends signal to the arduino. The arduino actuates the stored voice in the voice module using speaker. After 3 seconds time delay, the buzzer will be actuated. In real times, the alert signal is given to the dam surroundings only by using a squad. By using this project alert signal will be given to the people around 64 miles by using XTend module. The dam model is created with mild steel. The mild steel is selected as it is cost effective and has good mechanical properties like strength, flexibility and so on. The ultrasonic sensor is mounted on the top of the inner side of the dam. The other components like XBee module (transmitter), microcontroller, LCD display, relay and power supply are attached to the left side of the dam. The gate of the dam is

opened with CD drive tray which moves in forward and reverse direction for the dispatch and storage operation.

Fig. 2: Gate of the dam

Arduino programming is used and x-ctu software is used for configuring part. A separate program for interfacing the arduino program to the XBee module both on the transmitter and receiver side and a separate program for using the voice module is also programmed.
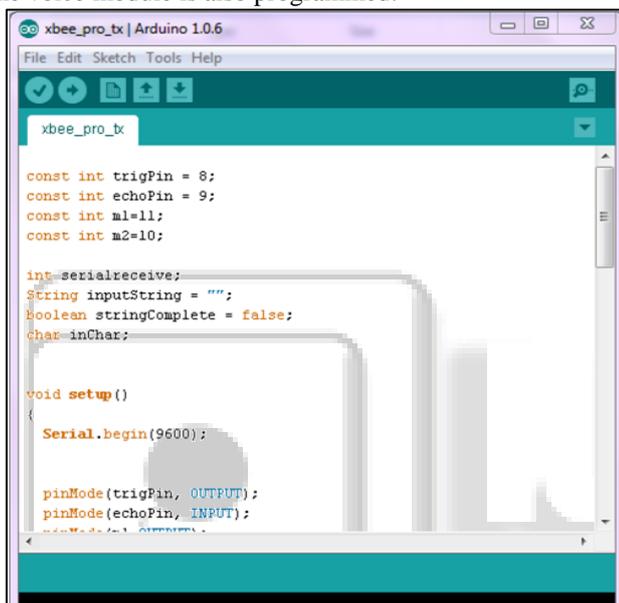

Fig. 3: Arduino programming

V. CONCLUSION

This project gives alert to the people who are living near to river bed to save their life, when the dam water is released. If the people does not get the information about the dam water release, there is a chance of accident. In history many people were died due to this type of accident. When the dam is filled with water, the ultrasonic sensor will sense and the alert signal will be send through the XBee (wireless protocol) automatically to the people who are living near to the river bed. Once people were alerted, the dam will be opened automatically. This project will also protect the people's lives.

APPENDIX

```
const int trigPin = 8;
const int echoPin = 9;
const int m1=11;
const int m2=10;
int serialreceive;
String inputString = "";
boolean stringComplete = false;
char inChar;
```

```
void setup()
{
Serial.begin(9600);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
pinMode(m1,OUTPUT);
pinMode(m2,OUTPUT);
}
void loop()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
inch=(duration/74/2);
cms=(duration/29/2);
if(cms<=10)
{
Serial.println('a');
//motor
digitalWrite(m1,HIGH);
delay(300);
digitalWrite(m2,LOW);
delay(300);
digitalWrite(m1,LOW);
delay(5000);
digitalWrite(m2,HIGH);
delay(300);
digitalWrite(m1,LOW);
delay(100);
digitalWrite(m2,LOW);
delay(100);
}
}
```

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