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ADVANCED FLOOD LEVEL MONITORING AND ALERTING SYSTEM

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Abstract –Floods are the natural disasters that cause catastrophic destruction and devastation of natural life, agriculture, property and infrastructure every year.The main aim of this project is to monitor distance between water and particular land mark using ultrasonic sensor for flood prediction analysis. The IoT approach is deployed for data collection from the sensors and communication over Wi-Fi.It alerts the people before the water level reaches the safety level via SMS,BUZZER,LCD DISPLAY.The incoming water level is measured by level sensor.

Key Words: Flood prediction,IoT,Sensor,Water level

1. INTRODUCTION

In most countries in the world, flood had caused damages to properties and it involved a large amount of loss to individuals and governments. During flood, it is important to have efficient flood response operation system to manage all activities among different related agencies. These last decades, lots of flooding order to get an update or latest information In addition to that, individuals risk technologies has been developed to minimize the danger of flood in inhabited areas.Currently, the Philippine government funded the Project NOAH of the Department of Science and Technology (DOST). They installed Automated Rain Gauges (ARG) and Water Level Monitoring Stations (WLMS) along the country's major river basins (RBs).However, these systems are usually for one-way communication only.In order to get an update or latest information, local communities need to access the website. And in accessing this website, it requires computer or smart phone that has an Internet feature, and most individual could hardly afford to purchase one. In addition to that, individuals are busy for their daily routine, and monitoring activity cannot be their priority. These are the reasons why communities are blinded with the current status of the nearby river watershed. The unawareness led to the overflow of the watercourses of the river waterway and the subsequent inundation of various localities causing extensive damages to properties and human life.

1.1 MOTIVATION OF THE PROJECT

Flooding is usually brought on by an increased quantity of water in a water system, like a lake, river overflowing. On occasion a dam fractures, abruptly releasing a massive quantity of water. In today's scenario there is no immediate indication about the flooding for the people. Many people die because of heavy flooding and gets affected.By providing flood levels in three stages. First level means the message will sent to all the mobile in offline communication(gsm),Second level means the Buzzer will give alert,Third level means the motor will stop which gives a red alert.LCD is used to display the levels of flood.This will be uploaded in webpage with date and time by using IoT.

1.2 PROPOSED SYSTEM

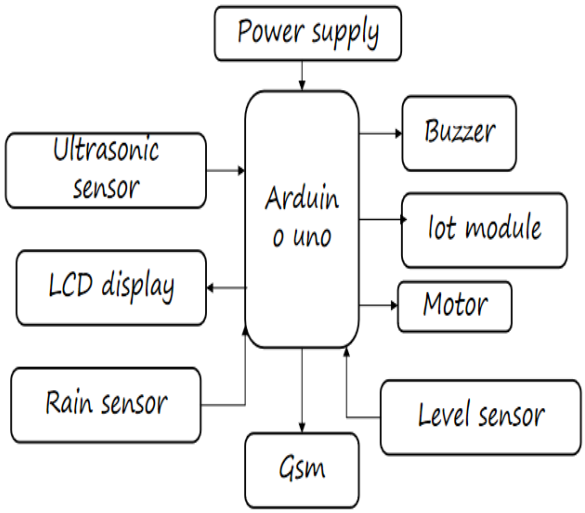
- The main concept of the proposed work is to alert during flood for protecting the people from flood caused suddenly without any intimation.
- This self operated system enables the monitoring station to be informed on the water level changes at a certain location on real time basis.
- Apart from alerting the monitoring stations, the system can also be used to trigger flood warning signs for road users, buildings and public areas instantly.
- Electronic display system will be best to display such information in public locations.
- Here the internet of things facility is available to monitoring and controlling data with time and date we can view that webpage(desktop page) using gadgets with help of internet.
- When there are changes in water level at flood prone locations, the information can be translated and displayed in this display system

1.3 WORKING PRINCIPLE

The Flood Observatory System is fully automated device which is capable of operating without human intervention at all time regardless of the location being installed. The water level is detected by utilizing wireless sensor

technology which is designed to generate a digital signal from the monitored location. The Radio Frequency (RF) receiver is placed in the centralized control unit to receive signals to be processed.The real time water level information is sent to the monitoring station as programmed, via the short message system (SMS). The Flood Observatory System consists of three main components which are connected to one another wirelessly via RF. The centralized control unit and display system can be placed at a distance away from the sensors situated in a remote in high risk flooding locations.

2. BLOCK DIAGRAM



2.1 BLOCK DIAGRAM DESCRIPTION

The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. This allows for faster transfer rates and more memory. The IoT approach is deployed for data collection from the sensors and communication over Wi-Fi.The purpose of ultrasonic sensor is to predict a flood level using sound waves .If the flood level reach the first level means the message will send to all the mobile in offline communication (gsm).LCD is used to display the water levels.The Buzzer will alert if the flood level reaches the Second level.The DC motor will stop working and indicates a red alert if the flood level reaches the third level.

3.1 HARDWARE REQUIREMENTS

- Arduino uno
- IoT
- Ultrasonic sensor
- Gsm
- Buzzer
- Motor
- Lcd display
- Water level sensor

3.2 SOFTWARE REQUIREMENTS

- Arduino IDE
- Embedded C
- Webpage Development(IoT)

4.1 HARDWARE RESULT

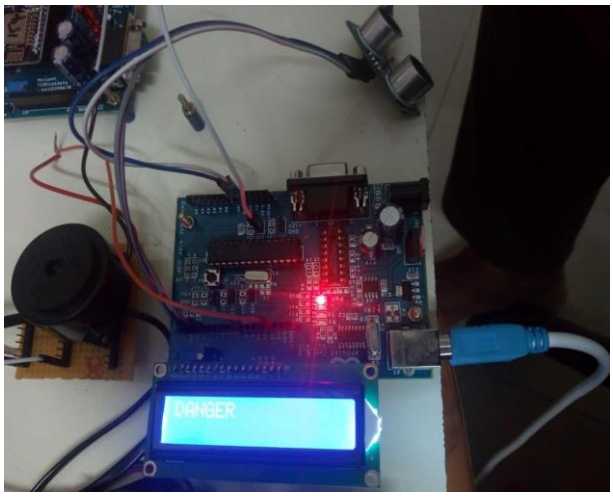


FIG 4.1 Hardware connections

4.2 SOFTWARE RESULT

In software coding,we add the logic of our program to alert the buzzer,Lcd display and to send the sms.

```
if(distance<=5)
{
lcd.clear();
lcd.print("DANGER");
delay(1000);
Serial.println("DANGER");
digitalWrite(buzzer,HIGH);
delay(1000);
digitalWrite(buzzer,LOW);
delay(1000);
}
```

In the above program, we keep the safety level of water in 5cm for project purpose.If it exceeds the safety level it shows the “DANGER” in the LCD display and the buzzer on

for the short time period also the SMS was send to the people instantly.

CONCLUSION

This project contributes towards economy and the citizens. It envisions a safe, prepared and less casualty community before, during and after typhoon devastation. The model also promotes the use of real-time monitoring system through the developed web-based application and SMS notification system as an easy medium in disseminating information particularly in the remote areas. By allowing the system in two-way communication, it gives more flexibility in providing important information to the community. Finally, the developed flood monitoring and early warning system to detect water level, functions perfectly according to the specification provided. It successfully passed several tests based on the different parameters.

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