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Integrated Automatic Flood Warning and Alert System Using IoT

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Abstract: *Flood is major problem in our world. Flood is an unavoidable natural disaster in all over the world, causing heavy flow of water and also severe damage to properties and lives. For this reason, we need to create a flood detection system to monitor rising water residential areas. By using ultrasonic sensors, we need to create flood level sensing devices which will detect the water level. This system is integrated to the microcontroller board which will help to send the data each time the water reaches the will be stored in a cloud. The data stored in the cloud will help to send it to the users. The user can get real-time information on monitoring flooded roads through android application.*

The ultrasonic sensor senses the continuously water level and LM35 is used for sense the temperature. This data fed to the Arduino UNO. The Arduino uno compare and analyse data to set threshold value. Then the alert SMS send to the mobile and also the LED are glow frequently. Also, buzzer will be activated. Due to the android application, it is user friendly and helps to get information in one touch. Update will be given to the rescue team and to the residents of the locality and in order to alert the person in charge of the control unit, the buzzer and LED will give information. This project is useful for future displacement.

Keywords: Arduino Uno, Ultrasonic Sensor, IoT Wi-Fi Module, LCD, Buzzer, LED's, LM35, etc.

I. INTRODUCTION

Flood is an unavoidable natural disaster in all over the world, causing heavy flow of water and also severe damage to properties and lives. Flood is affected to various material as well as human beings. It's made financial losses. Flash floods and massive traffic jam on roads also caused by heavy rain. Thus, it is important to be able to warn the people who are most at risk, so that the effects of these disasters can be reduced.

In earlier situation in Maharashtra, In July 2021, the most affected regions are the districts of Raigad, Ratnagiri, Sindhudurg, Satara, Sangali and Kolhapur. Due to heavy rains, more than 1,020 villages are affected in these districts. As per report, 3,75,000 people have been evacuated, of whom around 2,06,000 are from Sangali district and around 1,50,000 from Kolhapur district. There have been more than 28,700 poultry deaths and around 300 other animal deaths in Kolhapur, Sangali, Satara and Sindhudurg districts. Initial estimates state that over 2 lakh (2,00,000) hectares of crops have been damaged in the floods.

For this reason, we need to create flood level sensing devices which will detect the water level. This system is integrated to the microcontroller board which will help to send the data each time the water reaches the threshold value If water level reaches threshold value, people will get alert messages on their phone through android applications. And LED and Buzzer can be used to alert people. Therefore, we need to trying to best for our future. This dangerous situation is fall in every year, so This experiment used to prevent the local people's lives and also everything has safe. Generally, flooding cannot be stopped and unavoidable, but early detection or warning system can be used to reduce losses and faced problems by the citizen and government.

II. OBJECTIVES

- Real Time data collection of rainfall water level and weather information
- Critical level detection.
- Turn on buzzer and send alert SMS and LED will glow.

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III. LITERATURE SURVEY

1. Title: The Development of Smart Flood Monitoring System using Ultrasonic sensor. Author: Nor Anum Zuraimi Md Noar, Mahanijah Md Kamal. Year: 2017.

2. Title: Smart flood disaster prediction system using IoT & Neural Networks. Author: Swapnil Bande, Prof. Dr. Virendra V. Shete Year: 2017.

3. On Floods so far, several literature studies have been conducted in order to gain the understanding and the knowledge to implement an advance flood monitoring system L. SiewKhaun et al was able to invent a system that could detect the water depth when it is over the standard level as specified by the sensor. This project was then placed where always a flood occurs. This project had the ability to the flashlight as a warning and also inform the control room. In this project Radiofrequency transmitter and receiver were used for information communication.

4. Edward Udo, EtebongIsong Article · January 2014 Nigeria as a whole and Uyo, a southern province in Nigeria, in particular is facing a serious challenge with an increasing frequency of flood in recent years. It is therefore crucial to utilize the state-of-the-art sensing and communication technologies to monitor and detect flood occurrences The role of the designed Flood Monitoring and Detection System (FMDS) based on WSN is to continuously monitor, detect and report the environment's status to a control unit using relative humidity, temperature, water level and amount of rainfall as flood indicators, whose values are gathered by sensors in the sensor field. The flood monitoring and detection system monitors and know the development of floods and then send flood notification SMS to the inhabitant of such zones for necessary action. The developed Flood Monitoring and Detection System (FMDS) covers 15 flood prone regions in Uyo metropolis in AkwaIbom State, Nigeria. The GIS map of the flood prone zones is incorporated into the FMDS. The system is composed of three major modules which are the sensor field module, surveillance module and the phone module. The system was developed using Java Programming Language built into surveillance module of the system. The developed system is robust and gives timely alert of flood occurrences.

5. Thinagaran Perumal, MdNasir Suleiman, C. Y. Leong. IoT Enabled Water Monitoring System IEEE Explore, 2015, In this paper [10],[11],[12] proposed an IoT based water monitoring system that measure water level in real time. The prototype is based on idea that the level of water can be very important parameter when it comes to the flood occurrences specially in disaster prone area. A water level sensor is used to detect the desired parameter and if the water level reaches the parameter the signal will be freed in real time to social network like Twitter. A cloud server was configured as data repository. The measurement of water level is displayed in remote dashboard. The proposed solution with integrated sensory system that allows inner monitoring of water quality.

6. Amjath Ali J, B. Thangalakshmi, A. Vincy Beaulah, Lecturer, Department of Electrical and Electronics Engg., Ibra college of Technology, Disaster-LINK is a smart IoT device that acts as an alarm and monitoring system during natural disasters that operates by communicating over internet. It comes with Wi-Fi support for internet connectivity and uses anIoT cloud platform which helps to control, monitor and manage the device. The device senses its local environment using onboard sensors and send early warnings to family, friends and colleagues immediately when it finds a disaster situation. It is also able to receive such warning alarms from other similar devices available on the internet and provide the user with voice, flashing light, SMS and E-mail alarm notifications. The ultimate aim of the project is to spread the disaster warning information quickly through internet and make it available to those who need it as early as possible. The fact that internet is faster than the seismic waves of an earthquake, and much faster than a flood or tsunami, helps the device to deliver the alert message much before the actual calamity reach the user's location giving that vital extra time to take those precautionary emergency measures.

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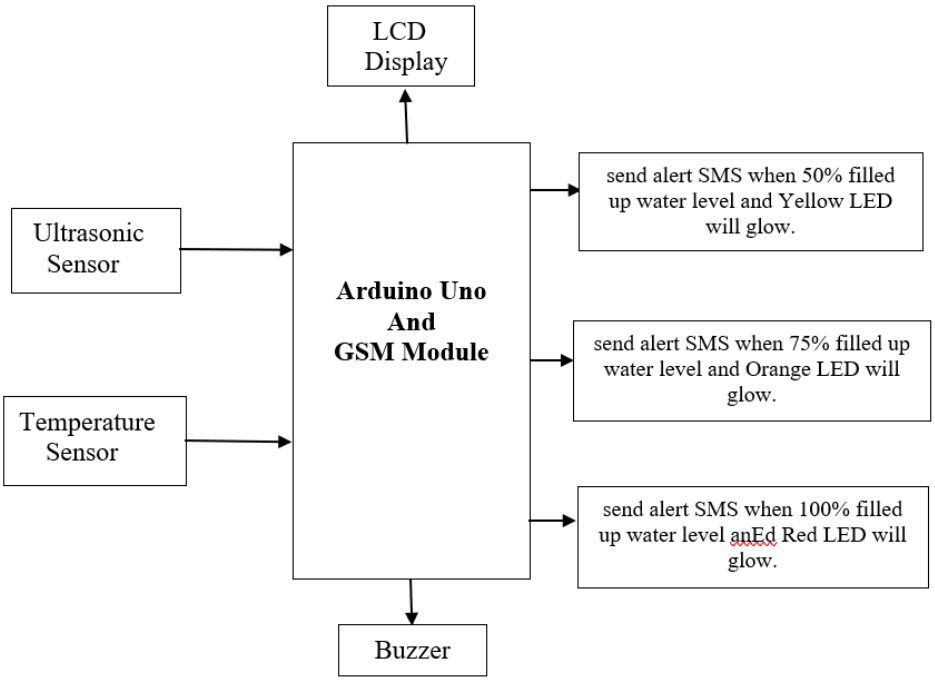
IV. SYSTEM ARCHITECTURE



V. FUTURE SCOPE AND CONCLUSION

This project based on the Early Flood Monitoring using IOT to detect & monitor the water level. In this project we are using Arduino uno, LED, Buzzer, ultrasonic sensor, Android Application.. Through android application the user can get information about flood. The Arduino uno compares and analyse the data with set threshold values. The rescue team will be alert by using LED & Buzzer that will give information about the person in danger. It can be helps to saves human life and reduce many losses.

In future it will improve the design and add new technologies like PLC and Arduino. Improve body design and other body improvements and Save Human life. This Project is very useful to many dangerous locations to their have peoples facing those problems.

This project has given multiple outputs that is the LED's are used for indicating purpose, buzzer is used for alarm and also the IOT Wi-Fi module used for sending SMS to linked contact.

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ACKNOWLEDGMENT

It is indeed a great pleasure and moment of immense satisfaction for we to present a project report on Integrated Automatic Flood Warning and Alert System Using IoT amongst a wide panorama that provided us inspiring guidance and encouragement, we take the opportunity to thanks to thanks those who gave us their indebted assistance.

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BIOGRAPHY

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