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Flood Monitoring & Alerting System

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ABSTRACT:-Since we are now currently present in an era of Computing Technology, it is essential for everyone and everything to be connected to the internet. IOT is a technology that brings us more and more close to this goal. Our project comprises of smart water monitoring system which is a small prototype for flood detection and avoidance system. This paper explains the working and the workflow of all the components present inside our project. The sensors sense the environment and sends real-time data to the cloud (firebase cloud) and users can view and access this data via their mobile platform. The model gives a warning after the water level rises to a particular height. Since it is a small scaled prototype for flood detection and avoidance system, the working of this model is good. The data are uploaded and changed in the cloud in precision to the sensor and real-time changes in the mobile application is achieved. This model can be used to greatly reduce the casualties in a devastating event of flood.

KEYWORDS: Arduino, Detector, Flood, Sensor.

I. INTRODUCTION

Flood occurs when water overflows from the river, lake or from heavy rainfall and it can happen at any time of the year. Flooding can be very dangerous, when floods happen in an area that people live, the water carries along objects like houses, cars, furniture and even people. It can wipe away property, trees and many more heavy items. For years, flooded roads have been a problem in Many places. It causes heavy flow of traffic. Both motorists and commuters ARE getting stuck in a flooded areas and getting lost in finding possible routes just to go to their destinations. When traffic happened, people's money, time and effort are wasted. Through the local government unit flood control has been extending their efforts to inform the commuters regarding the situation in flooded areas during rainy season, still the dissemination of information to the locals are not enough. For this reason, the "Arduino Flood Detector System" is been develop, to help the road user to avoid this problem happened. It was invented based on problem faced by motorists and commuters when flood occurred. This will avoid the traffic jam because the users have a time to find a possible routes before they are going to be stuck at the flood area. The system will function when the admin activate the system and when water along the road detected by distance over ultrasonic sensor. When the flood occur, the ultrasonic sensor will sent signal to the microprocessor circuit and the sense water level will be display in the user interface and it will automatically send a Short Message Service (SMS) to those recognized residents and it will continue update until the water level detected returns to normal. The process repeats as the water level continuous to rise. The idea of an SMS based warning system was proposed because mobile phones have become a popular communication device among people all over the world. All mobile phone are able to communicate because it comprises of a GSM. This system used to detect the current water level of flood around the road and will give real-time information to the motorists or commuters that has still not passing through the flooded areas to avoid problem.

II. PROPOSED SYSTEM

Flood is an unavoidable natural disaster in Metro Manila, Philippines, causing heavy flow of traffic and can also cause severe damage to properties and lives. For this reason, researchers created a flood detection system to monitor rising water in residential areas. Using ultrasonic sensor, researchers created flood level sensing device which is attached to Arduino to process the sensor's analog signal into a usable digital value of distance. The user can get real-time

information on monitoring flooded roads over the livestream plus SMS based service. Flood height is determined by subtracting the sensor's height with respect to the floor minus the sensed distance between the sensor and the flood water. Updates on the height of the water level will be texted to the rescue team (Local Government Unit) and to the residents of and can the locals can also view level of the flood in the interface of the system. The level of the flood will be divided into four. The Arduino Flood Detector System is developed to be one of the fastest method to monitor flood that will help motorists or road user to avoid problem when flood occurred.

2.1.1 Objectives

The main objective of this project is to develop and design a flood detection system that will detect flood automatically and send data to the Local Government Unit and to residents using an Arduino.

Specific Objectives

- To design a circuit and create a programming code using the microcontroller.
- To apply the Serial Communication in transmitting the data from one place to another place.
- To detect the current level of the flood where the system sensor will be divided into four levels.
- To warn residents of City about the flood water level.

III. SYSTEM ARCHITECTURE

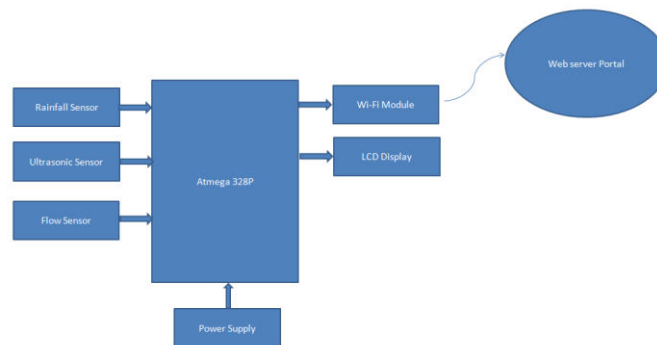


Fig -1: Block Diagram

An IoT early flood detection and alert system using the Arduino is thus, a proposed solution to this problem. The system consists of various sensors which are temperature, humidity, water level, flow and ultrasonic sensors and also includes an Arduino controller, a Wi-Fi module, an LCD, an IoT remote server-based platform and an android application with constructed user friendly GUI relaying all the vital information involved in the picture in a visual format. The above-mentioned sensors measure the various environmental and weather-related parameters and monitor them constantly. The data from these sensors is constantly fed to an Arduino controller. The Arduino program checks for any irregularities in the sensor measurements and performs the associated computations. The Arduino also has a Wi-Fi module attached to it, which enables it to send the sensor data to the remote IoT platform using the IoT protocols over the Wi-Fi connection. The LCD is used to display the real-time values of the sensors. These data can also be viewed on the android application, which constantly retrieves the information from the remote IoT platform. If the value of any sensor crosses over a certain threshold value, an alert is sent to the end user via the android application. Using this system, the flood-related parameters can be monitored from anywhere in the world remotely. 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. The outcome is that a number of the water travels into soil, and „flooding“ the region. Rivers are involving riverbanks, in a station. Aside from lack of products and house and office property, streets infrastructure flood water consists of bacteria and sewage flow of waste sites and chemical spillage which leads to a variety of diseases afterwards.

Flood predictions need information like:

- The speeds of change in river stage on a Real time basis, which may help indicate the seriousness and immediacy of this threat.

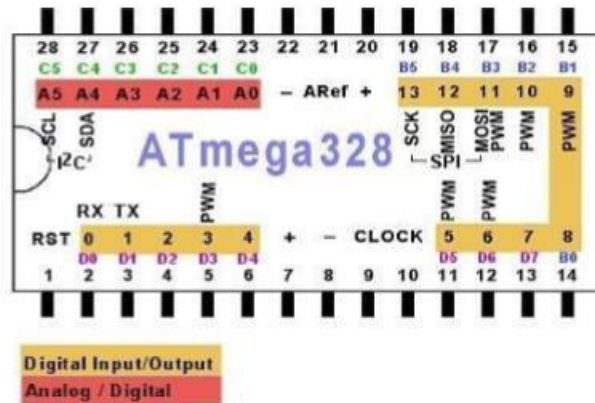
ii) Understanding of the form of storm generating the moisture, such as length, intensity and areal extent, which is valuable for discovering potential seriousness of the flood.

In this system we make use of an Arduino with sensors to predict flood and alert respective authorities and sound instant alarm in nearby villages to instantly transmit information about possible floods using IOT. Different sensors namely flow, ultrasonic, float, temperature, humidity sensors are used to monitor the water level our system utilizes the power of real-time database (firebase) integrated with android.

3.1 Hardware Description

1. ATMEGA328P microcontroller

It is the heart of system which is connected with all the sensors and other hardware assembly required to achieve the desired work. It is used as the hardware platform. It is the heart of system, to which all other components are interfaced. It is a low voltage and an 8-bit high performance microcontroller of AVR family with low power consumption and is based on enhanced RISC architecture with 131 powerful instructions. Most of the instructions requires one machine cycle for execution. Its operating frequency is 16MHz. It is a 40 pin microcontroller and has 32 I/O lines.



2. Rainfall sensor

A rain sensor is one kind of switching device which is used to detect the rainfall. It works like a switch and the working principle of this sensor is, whenever there is rain, the switch will be normally closed.



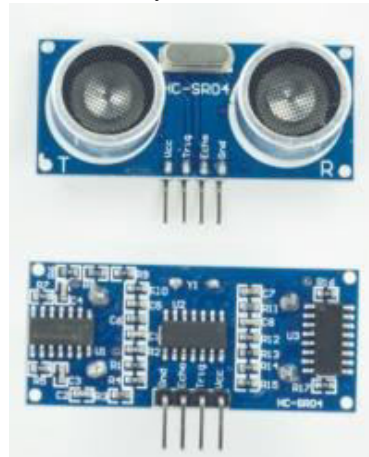
3. Flow Sensor

Huge industrial plants, commercial and residential buildings require a large amount of water supply. The public water supply system is used to meet this requirement. To monitor the amount of water being supplied and used, the rate of flow of water has to be measured. Water flow sensors are used for this purpose.



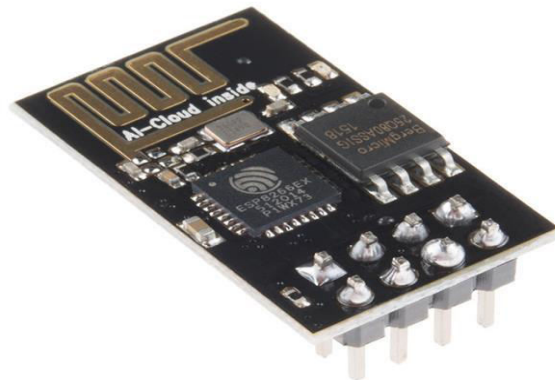
4. Ultrasonic sensor

This is a 4 pin module. It is a very popular sensor used in many applications where measuring distance or sensing objects are required. The sensor works with the straightforward formula: $\text{Distance} = \text{Speed} \times \text{Time}$. The Ultrasonic sensor transmits an ultrasonic wave, this wave travels in air and when it gets obstructed by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module.



5. Wi-Fi module

Wi-Fi module is a MQTT (Serial Port Protocol) module, designed for transparent wireless serial connection setup. This Module can be used in a Master or Slave configuration, making it a great solution for wireless communication. This device used for wireless communication with Wi-Fi enabled devices (like smart phone). It communicates with microcontrollers using serial communication (USART). Here, as we will monitor the operations of robot on smart phone thus Wi-Fi required.



6. LCD Display

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.



IV. FLOW CHART

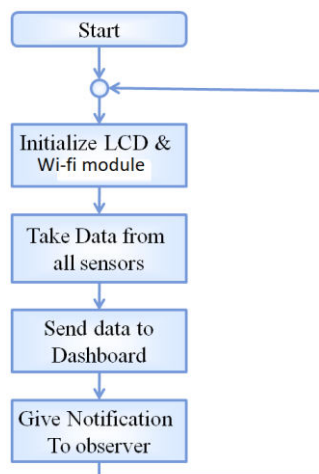


Fig 2 Block Diagram



V. CONCLUSIONS

It is impossible to predict how and when the Natural Disasters occur. But it is possible to predict the floods that can be caused due to overflow in dams. The cause of flood Disasters depend on various factor ex: Water level in water bodies, Rainfall, water flow from dams etc. In this project we have considered the water level in dams by installing various sensors, we get water level so that continuous monitoring is done, if the threshold value of sensor gets exceeded an intimation about the flood is sent. Rainfall sensor and water flow sensor is also implemented and fixed threshold is kept , if the values of sensors crosses this threshold a notification on display , and a message in app along with beep of buzzer occur so as to know whether there is possibility of flood.

REFERENCES

- [1] Warren, J., Adams, J., and Molle, H. Arduino Robotics
- [2] Hughes, C., Hughes, T., Watkins, T. and Kramer, B., Teams of Robotics with Lego Mindstroms NXT & Bluetooth
- [3] MMDA activates flood control information center from <http://www.topgear.com.ph/news/mmda-launches-flood-monitoring-and-control-center>
- [4] Shannon Doocy (2013) The Human Impact of Floods from <http://currents.plos.org/disasters/article/the-human-impact-of-floods-a-historical-review-of-events-1980-2009-and-systematic-literature-review/>
- [5] Girish, Sharmaa (2015) Floods and Its Prevention, from <http://www.publishyourarticles.net/eng/articles2/essayarticle-on-floods-and-its-prevention/1819/>
- [6] Nantes, B (2012) Flood Hazards in Metro Manila: Recognizing Commonalities, Differences, and Courses of Action, from <http://www.journals.upd.edu.ph/index.php/socialsciencediliman/article/viewFile/367>
- [7] Vergel, J. (2012) Real-time hourly forecasting with Armax models with application for real-time flood operation at Angat reservoir, from <https://ph.linkedin.com/in/john-manuel-vergel-1084035a>
- [8] Arduino Yun Definition from https://store.open-electronics.org/index.php?_route_=Arduino_YUN



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