

# Real Time Early Flood detection using IoT and Alert System with Android Application.

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**Abstract :** Flooding is one of the major disasters occurring in various parts of the world. The system for real-time monitoring of water conditions: water level, flow, and precipitation level is developed to monitor flood. The objectives of the developed system is to serve as information channel for flooding between the involved authorities and experts to and as a web based information source for the public

**IndexTerms - Flood Monitoring, Node MCU ESP8266, Sensors, Android Application.**

## I. INTRODUCTION

Climate change has been a serious problem which attracts the interest of many countries in the recent years. One of the clear effect of climate change is flood which has happened more frequently in many regions and caused the devastating impacts on human lives and livelihoods. Many flood warning stations have been developed and installed in prosperous countries but the manufacturing cost is usually too high to be practical in developing countries. Therefore, building an efficient flood warning system while maintaining reasonable production cost has been a meaningful mission for many researchers and manufactures.

Various flood detection methods have been introduced in the past decades. The authors in [1]–[3] analyzed the images captured by satellite in different ways to detect the areas where flood occurred. These techniques are only useful in flood localization but they can not predict whether flood occurs or not in the next hours. M. Oprea proposed a prototype intelligent system for flood warning and alert in real time [4]. The purpose of the project is to develop a real-time flood monitoring and early warning system. This system provides better coordination of monitoring, communication and transmission technologies which are adaptable to background condition. This system informs the people about the upcoming flood through notification and alert messages and also it gives information about all safe places near the user location where user can migrate with the help of map. This system would be beneficial to the community for decision making and evacuation planning. Therefore, this system can be reached to every common peoples hand so that it can be used efficiently to detect the flood earlier and take precautions beforehand.

## II.METHODOLOGY

The system model is described in figure 1, which consists of three main parts:

**Monitoring sensors:** In this module we use An ultrasonic sensor, to monitor water level. Fluid flow meter, to measure the water flow and velocity. Precipitation sensors, to measure amount and intensity of rain. SIM808 GSM/GPRS/GPS development board along with NodeMCU ESP8266 that enables transmission of sensor data for real time visualization and storing data in database. When the water information is acquired through the sensors, it will be transmitted to GDU (gprs data unit) for data processing and data transmission via the mobile GPRS communication.

**Data transmission and processing:** The goal of flood monitoring system is to provide reliable network management to allow smooth transmission of water related data the system has mechanism that allow remote nodes to connect to the control center and has procedures for managing the entire wireless sensors network. The two main functionalities in this module is to first set the TCP/IP port for the server and manage concurrent TCP/IP connections between GDU's and server and retrieve all the data obtained from GDU's and put into the system database.

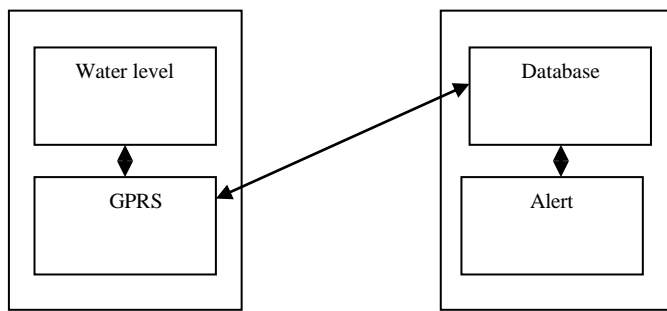


Fig 1: System Architecture of Flood Monitoring

**Database and application server:** The implementation and functionalities of database and application server is to alert its user's. This implementation is done using xml and java. It is implemented by dividing into two modules: Real time data reporting from sensors, forecasting, statistical and historical information module, and warning module. The android application shows the safest place in map where the user can migrate.

### III. RESULTS AND DISCUSSIONS

The main outcome of the project is to develop a real-time flood monitoring and warning system for a selected flood prone area. The system employs the use of advanced sensing technology in performing real-time monitoring of water information. For realizing sustainable social development, the forecasting and early warning systems will continue to play a vital role in providing accurate and reliable warning information to enable them to better prepare for unnecessary damages and losses.

### IV. CONCLUSION

The project contributes towards economy and the citizens. It envisions a safe, prepared and less casualty before, during and after flood devastation. The proposed system will be efficient because it has better coordination of monitoring, communication and transmission technologies which are adaptable to flood prone areas. The proposed system also ensures increased accessibility for assessment of emergency situations and enhances effectiveness and efficiency in responding to catastrophic incidents.

In order to enhance efficiency of flood prevention, the system could be integrated with modern space technologies and Geographical Information Systems (GIS). Today, space technologies are considered an efficient tool for risk assessment and emergency management systems.

### V. ACKNOWLEDGMENT

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