

# Flood Monitoring and Warning System Using IoT

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**Abstract:** Floods have large social consequences for communities and individuals. The immediate impacts of flooding include loss of human life, damage to property, destruction of crops, loss of livestock, and deterioration of health conditions owing to waterborne diseases. Currently available flood monitoring systems works more globally considering the water levels of rivers and weather information of different states in a country. One of the most and the preliminary step is to alert the local people before the occurrence of flood by considering the water level of rivers nearby and updating the emergency opening of dams. The alert system and flood monitoring system update the emergency opening of dams, current water level of rivers nearby particular localities to a website showing IoT logs which can be accessed by the technical authorities and sends the information or notifications in the form of SMS to the affected zones for the further steps.

**Keywords:** Arduino Uno, Flood monitoring, Dam monitoring, SMS alerts.

## 1. Introduction

In recent years flooding became one of the major natural disasters occurring in India. India is among the top 10 in the world's most food-threatened country [1]. There are many effects of floods where the material, human, economic and social losses are considered as some of the main effects of floods. Heavy rains are also one of the major aspects for the causes of flash floods.

The current method of monitoring the river banks and dams are done manually using markings and gauges. This is time consuming and it takes a lot of time for the authorities to get accurate informations. so there raised a need to develop a Real Time Solution to Flood Monitoring Using IoT and Wireless Sensor Network [2]. The scope of the system will be mainly focused with the Department of Irrigation and Drainage, Public Authorities including Rescue and Relief Operation teams and local individuals to be prepared for evacuation activities before the water level reaches their respective zones [3]. A flood warning system is proposed with a scheme which requires attention to three basic factors: Data collection via sensor networks, data processing, the hardware and software required,

and the dissemination of flood warning information. The system aims at alerting the authorities and local citizens about an imminent flood by monitoring the water systems in local areas [4].

## 2. Block Diagram of the System

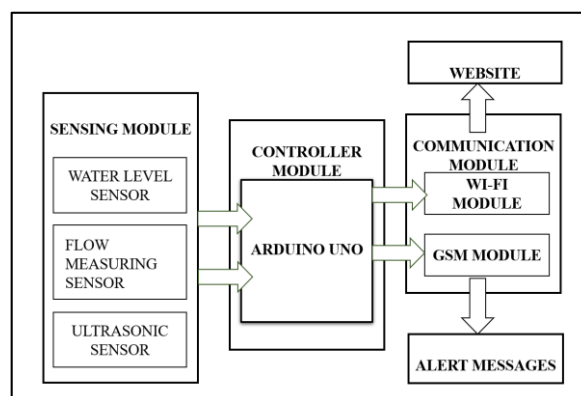


Fig. 1. Block diagram

### A. Flood monitoring mechanism

The system consists of mainly six modules. The sensing module consists of water level sensor for measuring the real time water level of water bodies, water flow sensors for measuring the flow rate and ultrasonic sensor for measuring water level of dams. This data is transferred to the controller over Wi-Fi using NodeMCU. The controller module is *Arduino Uno*, a microcontroller board based on the ATmega328P. The communication module consist of Wi-Fi module used for updating collected data from controller and GSM module for sending alert messages. At the server side, the data is received through python socket and is updated to a csv file created in the local memory of the controller. The incoming data is measured against the threshold and when the values rises above the limit, an alert system is enabled. The website module consists of a website displaying the real time data from the sensors and alert conditions which can be viewed by the corresponding technical authorities of the particular localities based on the location of installation of sensor.



most vulnerable areas using machine learning can be developed. By considering more parameters such as soil structure, weather data and so on, a highly accurate and efficient system can be developed. A more advance system will allow the authorities to divert the water using gates and hence provide greater control.

### References

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