FLOOD WATER MONITERING AND EARLY WARRING SYSTEM

SYSTEM ANALYSIS

I . METHODOLOGY

After going through literature survey and various research papers we finalized our hardware and software requirements. Various natural factors, which includes humidity, temperature, water level and flow level are observed by system to detect flood. Our system consists of different sensors which helps to collect data for individual parameters.

1. For detecting changes in humidity and temperature the system has a DHT11 Digital Temperature Humidity Sensor. It is a sensor which detects humidity and temperature.

2. The water level is always under observation by an Ultrasonic sensor, which works by constantly monitoring as water levels rise and fall. Once the water level increases beyond threshold, a trigger is generated which sends an Email Alert indicating the rise of Water and possibility of Flood.

3. The Flow sensor on the system keeps eye on the flow of water. The speed changes when water falls on rotor which makes it to rotate. After the successful completion of hardware setup, we move towards software setup and using Arduino IDE and Visual Studio Code. We created a Project Email for sending Email Alerts. Using Python Scripting and interfacing the Arduino outputs with Python, the program reads the inputs from the sensors via Arduino. We set a threshold value for the water level, once the water crosses the threshold level, a trigger causes the program to send an Email Alert notifying people regarding rise in water level and possibility of flood.

II . MODELING AND ANALYSIS ,

Flood is a huge threat to humanity as it is also considered one of the most devastating natural disasters in the world. Since flooding results in great damage to agricultural land, residential area, and the economy of the country. In a country like India,with extreme weather and climatic conditions, the occurrence of heavy rainfall.We are not just monitoring the water level using Ultrasonic Sensor, but also monitoring the flow of water using Flow Sensor which gives an upper hand for immediate alerting the danger. We are using advance Temperature and Humidity Sensor for getting more accurate and correct values of temperature and humidity of surrounding, this sensor works in all extreme conditions. We are using a Wi-Fi module which can send data over the internet. We have used Python for sending Email Alerts interfacing it water.

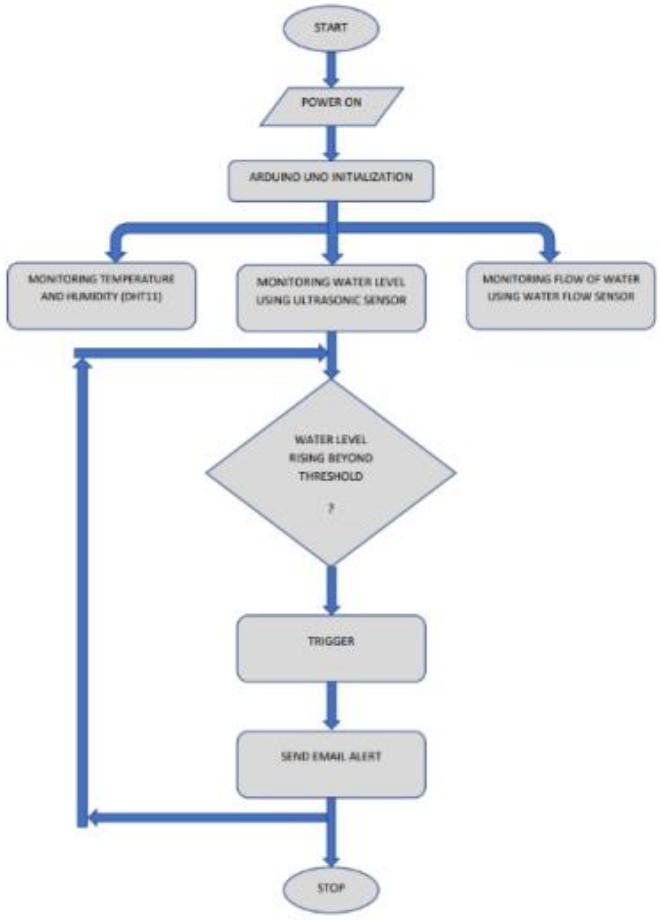

Figure 1: Flow Chart of the System

III . RESULTS AND DISCUSSION ,

We have successfully created the Flood Monitoring and Alerting System using Arduino UNO, ESP 8266 Wi-Fi module, DHT11 (Temperature and Humidity Sensor), HC-SR04 (Ultrasonic Sensor), , Flow Sensor, LCD display. We have also implemented Email Alerts and Real-time readings on the BLYNK App which allows us for Remote

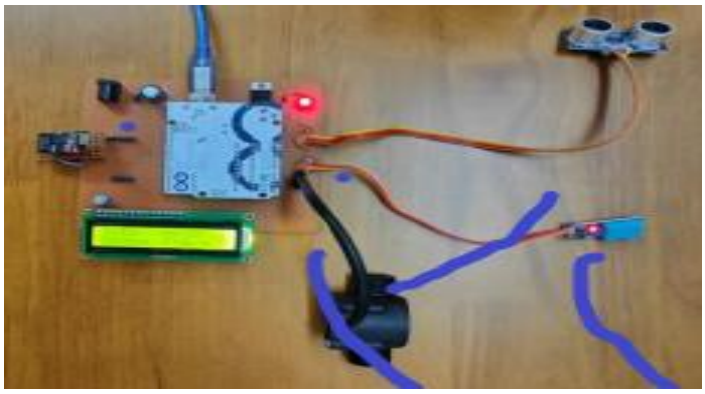

Fig 1.1 Hardware setup

Graph representation:

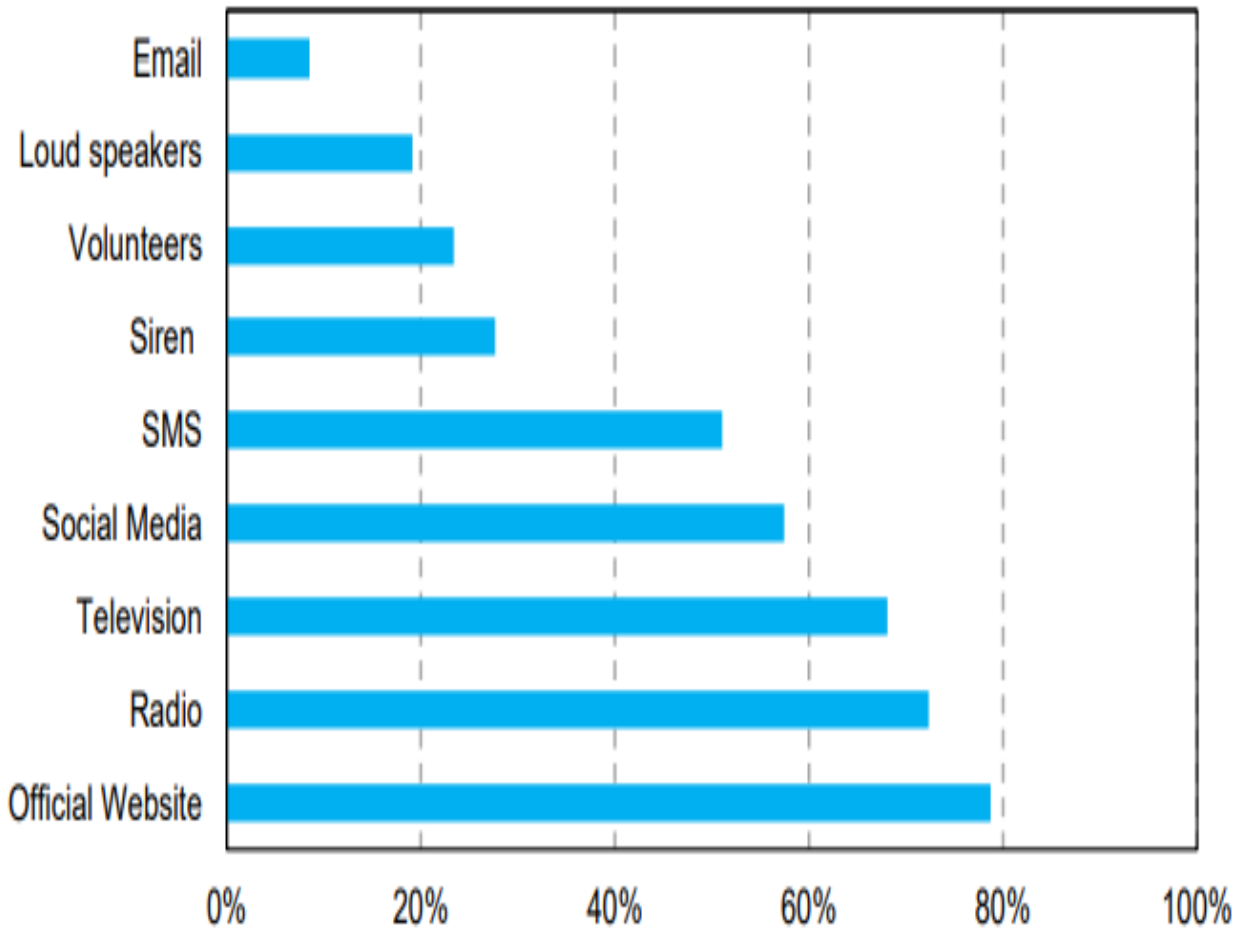

Figure 1.2: Warning dissemination methods used by survey respondents (%)

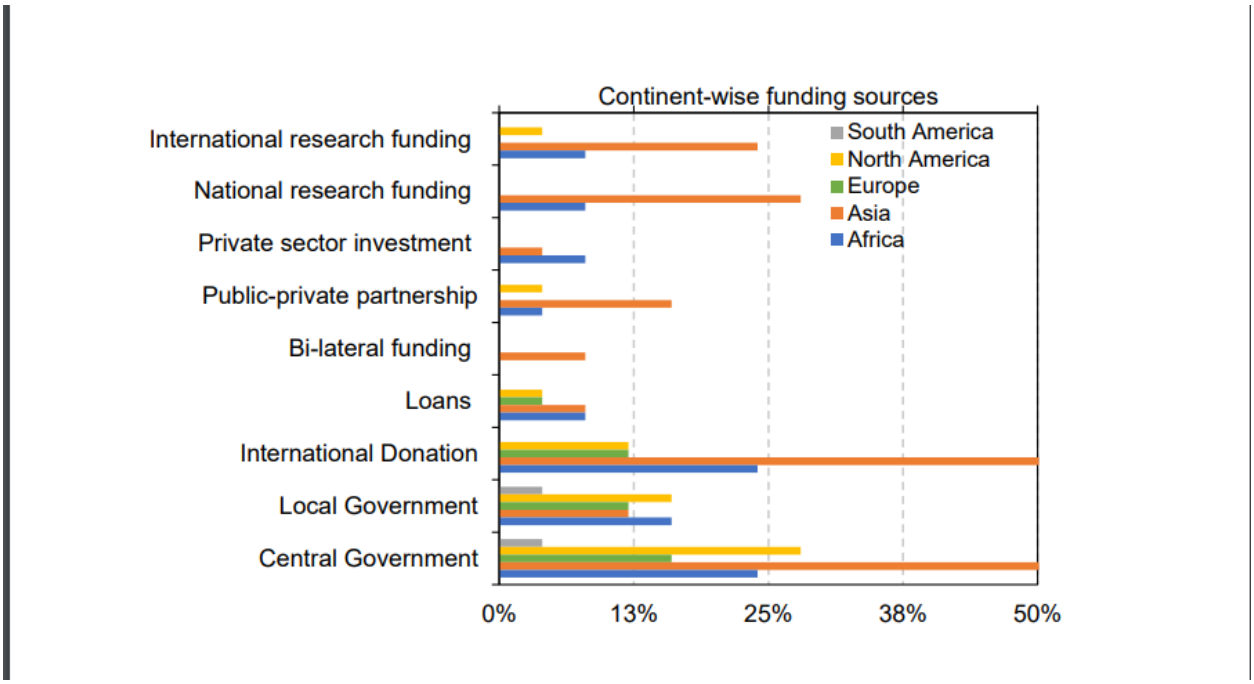

Fig1.2: Global (top) and continental (bottom) distribution of investments in FEWS

Some benefits of using a flood monitoring system include:

- High reliability as data is sent in real-time
- Timely detection of flood risks
- Tailored solutions that can easily be integrated with external development at level