FLOOD DETECTION & ALERT SYSTEM (F-DAS)

Introduction

One of the main disasters faced by us, in recent years are floods. So, this project aims to propose a Flood Detection and Alert System, for recording the rainfall and other factors that may cause a flood, make the calculations and warn the people and the authorities so as to take necessary precautions, and evacuations if needed. It consists of a central server, and various sensing devices for data collection.

The system is two folded:

1. To study the fashions in rainfall.

2. Issue alerts and warnings.

Concept

- Hardware   Tools :
    The hardware devices are all **IOT** based.
1. **Water Level Sensing :**
    The water level sensing device is mainly proposed to use in huge water reservoirs such as water lakes, dams etc. The system consists of a microcontroller board (arduino board), a water level sensor, a gsm module. The system measures the water level in the reservoirs, and sends the data to the central server, daily, or if there is a variation greater than a limit. The daily data is used for studying the trends, and huge variation in the measures are signals for an upcoming flood.
2. **Weather Conditions sensing :**
    These are small modules, proposed to use for various locations around the state, or the studying area, to measure various factors, such as rainfall, temperature and humidity. The system consists of a microcontroller board, humidity sensor, temperature sensor, a gsm module, and a digital tipping rain gauge. These measures values are sent to the central server for further processing.

- **Software tools :**

   The core prediction system runs on a central server which receives the data from

the sensing devices.

To find the area that is going to be affected by the flood, the total area under study is classified into section based on the elevation, since the lowest area are hit first by a flood. For this, the Openstreetmap or Google Elevation API is used.

And a machine learning algorithm, which uses the data from above stated sensors, and also the weather forecasts from the regional centres and meteorological studies, to predict the possibility of the flood.The results are classified into yellow, orange and red alerts which are localized to the above stated regions based on elevation.

After calculating these possibilities, warning signals are send to the people and to authorities using SMS.

Block Diagram
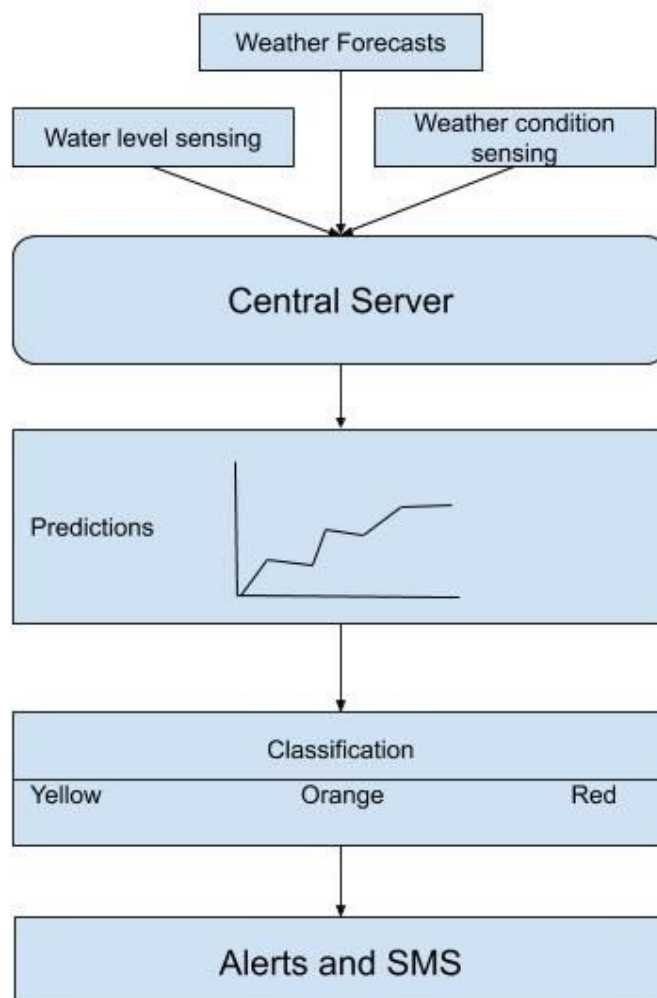
Business Perspective

These days, the occurrence of floods are increasing and are one of the main threats to life and wealth in any part of the world. An efficient system to predict and alert the fashion in floods and flood causing factors can help us take better precautions and save the lives and wealth of all living beings.

Increase in the total water level leads to floods, and that is what this system measures. And the opposite leads to droughts.In future, the same system may be tweaked to predict droughts and water scarcity, since it is the reverse fashion.

The system, as a whole, or just the hardware devices alone can be marketed all around the globe, since everyone is affected either by a flood or by a drought.

The Team

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Team Members :

All the members are S4 BTech Computer Science & engineering Branch students of Jyothi Engineering College, Thrissur

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   The idea has been discussed with the mentor and the team, and many suggestions have been made.

Supporting System

Our college has a FAB Lab which is used for projects like this and machineries like 3 D printers etc are available.

Financial Requirement

Est. cost for microcontroller arduino boards and sensors :   INR 6000

Server Rent (if needed to train and run the ML model)   :   INR 7000

Total   :   INR 13000

These are estimated values, and the real price may vary.