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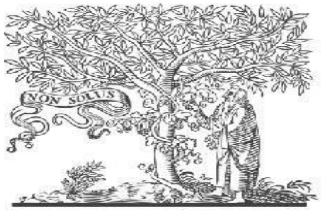

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EARLY FLOOD DETECTION USING ARDUINO

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***Abstract* – Natural Disasters such as floods and Hurricanes have been causing much damage to infrastructure and in some cases human fatalities across the globe. Compared to previous years, technological advancements have caused the establishment of many industries which release harmful contaminants into the atmosphere during their production. This procedure in turn damages the chemical composition of the air resulting in irregular rain cycle. This irregularity in rains often results in floods and hurricanes in nearby areas. To avoid this distress and property damage, our proposed methodology can help in detecting the flood early on to take necessary precautions. This is done by using a node microcontroller unit (MCU) with an ESP866 Wi-Fi module connected to temperature , humidity and ultrasonic sensors which detect the water surface temperature , Air humidity and water flow and level respectively . By collecting this data and passing through an algorithm we can predict the occurrence of the natural disaster well in advance and take preventive measures accordingly.**

I.INTRODUCTION

The system we are proposing uses IOT technology with a node MCU with wifi module and sensors attached to it for humidity sensing, water level and flow direction as well as temperature. sensor for measuring water level and water flow sensor for measuring the flow rate of water and all these sensor inputs are given to node MCU. When the power supply is given to the node MCU ,it analyses all this sensor inputs and compares it with the threshold values of temperature ,water level and water flow .If the sensor values exceeds the values of threshold then the the alert message is sent to the authorities and nearby residents through IOT connected with the mobile applicaton and if it does not exceeds the threshold values simply the values will displayed on the LCD screen.by using the IOT technology the alert message is send very fast through the internet and nearby residents and authorities can be alerted and can save their lives and valuable things before they put risk of their lives into risk.

Difficulties Involved in flood Monitoring

For making a forecast upon a flood, one requires some climatic parameters of the water body in question. The general parameters include water-levels, Discharges, Snowpacks, Precipitations and temperatures.

A regular report station only takes readings from a particular point, only giving some amount of information for a relatively vast area. Flood forecasters from an area reported that their river basins are equipped with insufficient gauging stations for rainfall, water level, and streamflow observations. Nearly half of the FCCs that responded admitted that their measuring equipment, gauges, and data transferring instruments are very old and inaccurate. Transmitting the collected data from the stationsto the forecasting centres is another problem, as a many stations in the developing countries rely on human observers, causing delay and inaccuracy in reporting. This makes developing countries encounter challenges in capturing the data during extreme conditions difficult.

Improvements can be made by installing

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metrological radars which provide spatial, real- time, or near real-time information. Still, the data they produce is less accurate than gauges and these technologies are very new to be considered for a robust hydrological model simulation

Hurdles involved in Forecasting a Flood

The information related to the parameters of the climate of a particular can be helpful in forecasting any calamities in that area. Apart from manual or satellite-based readings, climate researchers use an advanced computer software to predict weather called "Numerical Weather Predictions" (NWP) . The algorithm takes current weather conditions and compares that data with simulated models to forecast the weather. The data regarding the land, water and climate around an area is the key factor for predicting the weather it will have. In developed countries, forecasters have use fine resolution modelling and ensemble predictions to make up for the uncertainty in the forecasts. National weather centres in developed countries provide global forecasts from their global NWP systems. Still, those outputs have a very low spatial resolution. For higher resolution they need to be downscaled in local stations.

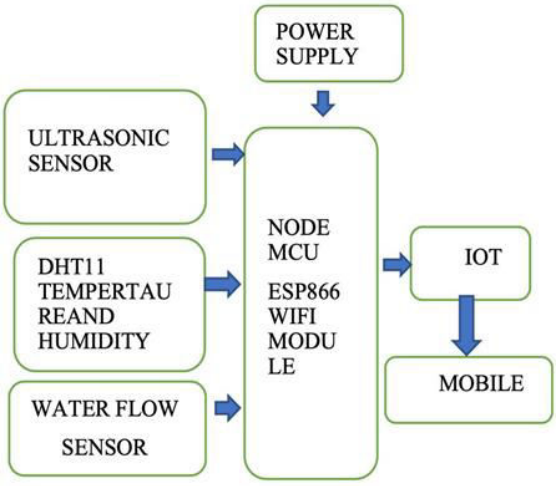
II.EXISTING SYSTEM

In the existing system of flood detection there were many problems like late communication for the people and authorities and alert them regarding flood, as we didn't use the internet of technology the message cannot reach early due to this people cannot alert themselves and save their whereas by using the internet of technology the message can be transferred and caution them and avoid from the dangers of a flood.

The existing system lacks in the field of having memory of floods which had occurred earlier to use as a reference to identify the strengths and weaknesses of the tidal waves pattern of the storms which happen in the area. predicting the occurrence of flood and changes of temperature values are not monitored frequently and recent update of values are not sent frequently to the locality people to prevent them from falling a victim to natural disasters.

III.PROPOSED SYSTEM

we are proposing a IoT based Flood Detection system which uses Node MCU with internal ESP866 wi-fi module and the DHT11 Temperature and humidity sensor which is paired with an ultrasonic sensor and a water flow sensor. power supply is applied to Node MCU then after applying all the inputs node mcu analyses all the sensor inputs and checks it with threshold values of temperature and humidity, water level and water flow if the values of the sensor are beyond the threshold values then we can send message to nearby people for alert to save them selves from dangers of flood. In this we are also using LCD display for showing the values of different sensors measurement ,in this we can connect different values of sensors and power supply to the MCU with internal wi-fi module and analyse data and give it to the IOT and through mobile application every one can access the data.



BLOCK DIAGRM

The Procedure comprises of the following steps.

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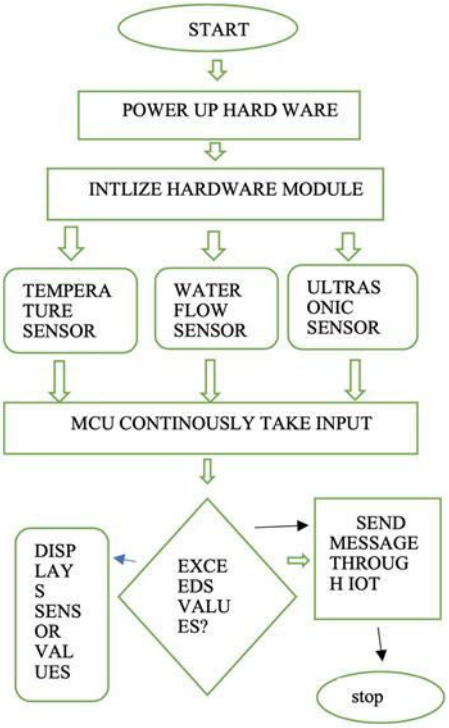
STEP1: initially the hardware setup should be powered to Start the process.

STEP2: Then the microcontroller unit take continuously input From the different sensors like temperature and humidity, Water level and water flow.

STEP3: if any sensor value exceeds its threshold value then the msg is given to people through IoT.

STEP4: display values in LCD.

The flow chart of the procedure is as follows.



FLOW CHART

IV.ADVANTAGES

1. Low Cost
2. timely detection of floods
3. highly realiable
4. as IoT is used it sends information very fast It is an intelligent system
5. in industry
6. which keeps close watch over various natural Factors.we can minimise the dangers of flood

V.APPLICATIONS

1. Used at the dams and reservoirs
2. Used in most areas of occurrence of floods.

VI.RESULTS

we are proposing a IoT based Flood Detection system with Node MCU ESP 8266 microcontroller and Dht11 Temperature and humidity sensor which is paired with an ultrasonic sensor and a water flow sensor. power supply is applied to Node MCU then after applying all

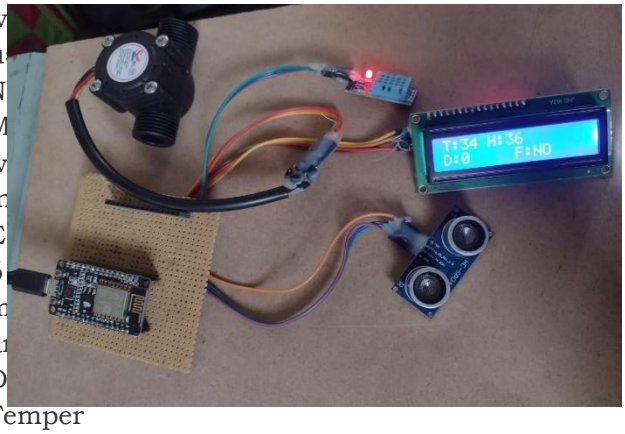


Fig:1 Flood Detection Kit

the inputs node mcu analyses all the sensor inputs and checks it with threshold values of temperature and humidity, water level and water flow if the values of the sensor are beyond the threshold values then we can send message to nearby people for alert to save them selves from dangers of flood.

VII.CONCLUSION

This IOT based early flood detection have used three different sensors ,and by using the threshold value and comparing the values of sensors input we can predict the flood occurrence and alert the people . As we are using the IoT technology the communication of flood prediction can be sent very fast so that before people experience the dangers of flood they can alert themselves and save their lives and precious things.

VIII.FUTURE SCOPE

Enhancements to the above mentioned circuit involve upgrading the node MCU to a more compact and efficient version, adding more water level sensor apparatus to measure the inflow more accurately at multiple sites. Thus, adding more functionality to the defined objective.

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