

Scrutinization and Collation of Kerala Flood and Developing a Flood Alert System



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Abstract

The flood of 2018 & 2019 were two of the biggest disaster that Kerala have ever faced. Many lost lives; lost their homes, lands and properties due to this disaster. A prognosis is impossible in the case of flash flood and landslides. Why did the flood happen in Kerala? We need to scrutinization happen due to flood. They are lot of problems in our planet, which changes our land pattern. We can't find out a proper solution to solve this situation, it is uncontrollable, only if had a warning before the flood came that will minimize the damages cost and death rate. The flood has left many questions in our mind, some of which are Information is available to us through the media but are these communication systems permanent for us even in heavy rain and wind??

It is the same with how to provide objective and continuous information to those living in isolated hopes as well as in rural and underdeveloped areas?

Excessive fake news is the big problem today. It often arrives via mobile messaging. What will those who do not know the truth of this do?

Is there no need for a communication between the authorities and the common people these days??

How to contact the authorities if all communications are lost?

We need to find the answer to all these questions. The new invention is being introduced in this project flood alert system. In this project we are going on developing a solution for the all above questions and also developing a working model flood alert system.

Keywords: Flood, Alert, Warning, Rain, Damages, Evacuation, Authority

1. Introduction

Flood is one of the most dangerous natural disaster. It is usually happening due to heavy rainfall, some other sudden causes like dam breaking or leakage due to so many reasons. India is highly prone to flood. Due to the geographical pattern of the country, it effects more and some other tsunami, floods are causes. There are many regions in the country that face this natural disaster because of the overfl-

owing of rivers. From this project, to understand the difficulties and losses faced by Kerala due to the floods. A new invention that can understand the flood a little earlier with a warning that invention named as “Flood alert system”. This project is an interdisciplinary one mainly has two phases that is civil engineering and electronics and communication engineering.

1.1 objectives

- Developed a flood alert system model
- Analysis of flood 2018 and 2019
- Developing a working model

1.2 scope of this study

- Limited to comparison of flood and developing flood alert system
- Further improvement in flood and minimum effect to the people and agriculture field also.
- It should make flood barriers effectively.
- Most effected deterioration can be minimized by making it in action.
- It's an interdisciplinary project it will be handy for public and authority.

1.3 Motive behind this topic



Fig 1: Floods in 2018 and 2019 (Source: Malayala manorama newspaper)

1.4 Literature review

The 1924 witnessed unprecedented and very heavy floods in almost all rivers of Kerala. Heavy losses to life, property and crops etc. had been reported. The rainstorm of 16-18, July 1924 was caused by the South-west monsoon that extended to the south of peninsula on 15th July and caused rainfall in Malabar. Under its influence, heavy rainfall occurred in almost entire Kerala. The area under the storm recorded 1-day maximum rainfall on 17th of July, 2- day maximum rainfall for 16-17, July 1924 and 3-day maximum rainfall for 16-18, July 1924. The centre of the 1-day and 2-day rainstorm was located at Devikulam in Kerala which recorded 484 mm and 751 mm of rainfall respectively. The Centre of 3-day rainstorm was located at Munnar in Kerala which recorded a rainfall of 897 mm in 3 days. The fury of 1924 flood levels in most of the rivers was still fresh in the memory of people of Kerala; the year 1961 also witnessed heavy floods and rise in the water levels of reservoirs. Usually

in the State, heavy precipitation is concentrated over a period of 7 to 10 days during the monsoon when the rivers rise above their established banks and inundate the low-lying areas. But in 1961, floods were unusually heavy not only in duration, but also in the intensity of precipitation. During the year 1961, the monsoon started getting violent towards the last week of June and in the early days of August, the precipitation was concentrated on most parts of the southern region of Kerala. By the first week of July, the intensity gradually spread over the other parts of the State and the entire State was reeling under severe flood by the second week of July. The worst affected area was Periyar sub-basin and it also impacted other sub-basins. Many of the important infrastructures like highways etc. were submerged. After a brief interval, by the middle of July, the monsoon became more violent, affecting the northern parts of the State. The average rainfall was 56% above normal. The maximum daily intensities recorded at four districts in 1961 are given in Table-1

Table 1: Recorded 1-day rainfall in different districts of Kerala in 1961

Sl.no.	District	Rainfall(mm)
1	Calicut	234
2	Trivandrum	136
3	Cochin	189
4	Palakkad	109

2. Methodology

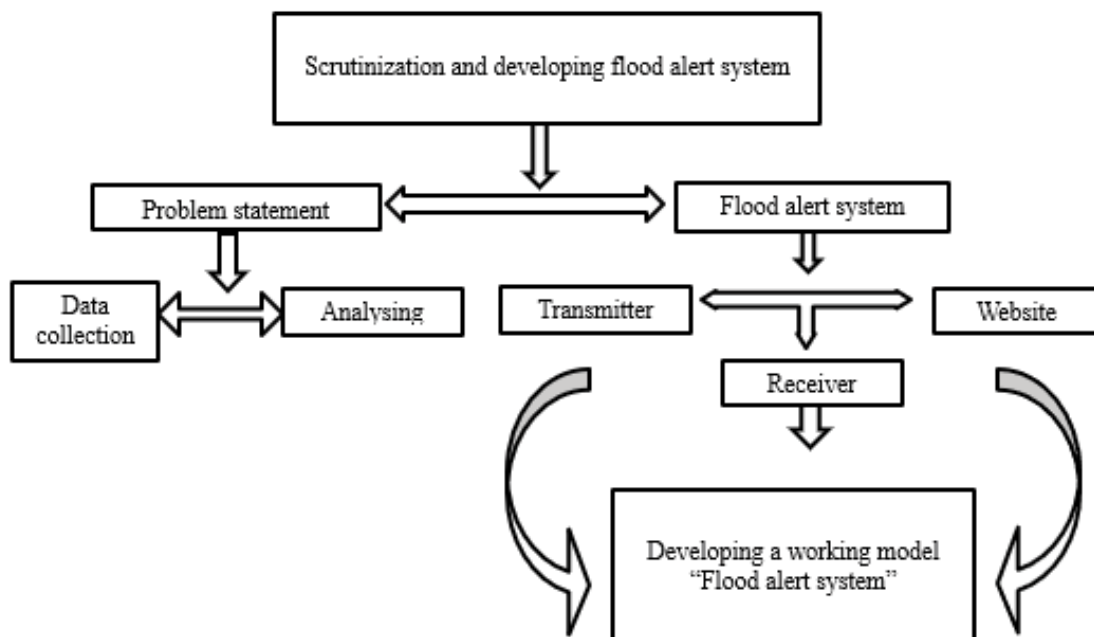


Fig 2

3. Flood Alert System Design

Here we design an automatic flood alert system which is controlled and co-ordinated by a programmed microcontroller unit. The float sensors detect the water level and its readings reach the control unit wirelessly (via RF communication). The program loaded in the microcontroller continuously monitor these readings and provide appropriate alerts if necessary. The vibration sensor is for detecting the earth-vibration and the emergency switch is for the emergency triggering purposes (for any help)

3.1 Drawbacks of existing flood alert system

The above systems are to be invented, but it has some drawbacks. Current flood alert systems are very large and the working is not easy for ordinary people. Flash floods are unpredictable. When the flash flood occurs all the transmitter and sensors that are placed near the river or reservoirs get swept away and that communication get lost too. So the existing flood alert systems are having so many demerits.



Fig 3: Flood alert system

3.2 Novelty

The existing flood alert system has lots of disadvantages and that are of same pattern. It has only a transmitter section that is located in river or reservoirs. The transmitter collects the water level and transfers the data to the authority, when it trickles that is off no use and at that time flash flood flows away. Another system gives the SMS and it will be a notification in rural areas that they are not having any communication system like phone or television in that areas, so they don't get the right news at the right time. In case of heavy rain, the communication gets destructed, so the information could be transferred to the authority.

3.3 website

The web page is the main part of this flood alert system <http://disaster.krabd.com/>. Because this help to make proper communication without any disturbances. The web page is situated in authority if authority is in collectorate, police station or any other centers there can be easily accessible the correct location and correct information without delay.

4. Working Model

4.1 Location

This is a new method named as flood alert system in a simple way for location of isolated places and rural areas. It will be affected effectively; it can use local persons also.



Fig 4: Flood alert system in isolated place (software Auto CAD)

4.2 Transmitter installation



Fig 5: Transmitter

From the above figure we can see the transmitter located at the shore from the water body and the floating sensors are lying to the water. The first one is near the first limit of water second one is above from the first floating sensor. When the water rises above the limit the RF signals are passed this message from transmitter to receiver at that time. But the transmitter can resist the flash flood, it's flows away when it comes.

4.3 Receiver installation

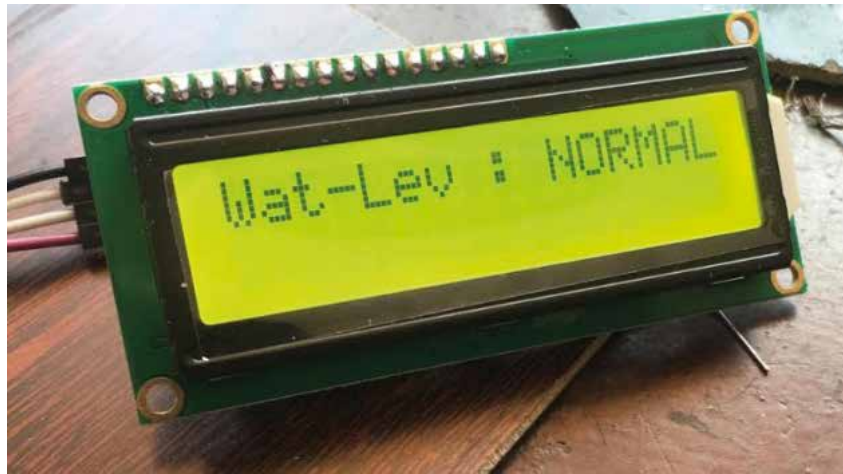


Fig 6: Receiver installation

4.4 web page

The web page is another important part in flood alert system. This is available in authorities, who are helpful from flood, like as police station, fire rescue, district magistrate office etc. This method is handy for the speed up the evacuation procedures. The site is open by entering the “username” and “password”.



Fig 7: web site

5. Conclusion

Heavy down pouring in Kerala during August and September in 2018 & 2019 have a wide spread effect in socio economic lively hood of the people in Kerala. It had affected the people in different manner. Vast destruction caused by the flood and related natural calamities during the monsoon season had a wide spread affect but the actual impact is not yet revealed. While analysing the effects of natural calamities on different socio-economic aspects of the people it is to be noticed that a permanent monitoring system is to be implemented to detect disaster prone geographical areas and rehabilitate the people from the risk ridden to the safe place.

Lack of advance warning is leading to an increase in the number of deaths and damages. Officials say there would not have been so many deaths if they had known a little earlier. We were asleep so we didn't know the water had gone up. We also saw ordinary people saying that all our valuable documents were lost and all our belongings were destroyed. The solution to all this is to give advance warning. The flood alert system comes to the fore as a solution to all these questions. It is clear from the previous chapter what it does. It can be changed by the authorities themselves in advance. A helping hand when all communication stops. The flood alert system is also a source for those who need help to communicate with the authorities. We can place it on the river bank or on the bank of the dam and then when the water level rises exactly, we will get a message from it and request help to the authority to escape.

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