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Dam to Dam Communication to Prevent Flood using IOT

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Abstract: Today, Flood is the major problem in the mainly rainy season. In 2019, almost 13 states are affected by the flood. Flooding due to different reasons is growing problem. Loss of human life, loss of livestock , damage of property , destruction of crops , increasing health problem occurs due to flood. The main reason of flood is mismanagement of Dam. There are many system which can be detect the flood, but there is no any system which will avoid the flood. This paper contains about a project which will avoid the flood. We made a system which will avoid the the flood. In our project, we considered two dams and bridge of a particular city "Sangli". In this project two Dams Namely "1st dam-Koyna" and "2nd dam-Almatti" will communicate with each other and decides the level at "Sangli" City Bridge. It will avoid the flood in Sangli City and Nearby areas of the "Krishna" river.
Keywords1: Iot – (internet of things) dams , Water level management , micro controller , flooding, Thingspeak

I.   INTRODUCTION

Flooding is a growing problem. Loss of human life, loss of livestock , damage of property , destruction of crops , increasing health problem occurs due to flood. It is essentially to prevent flood. The 2019, thirteen states of India is very badly affected by flood in July and August. In Maharashtra, almost 200 peoples are died and millions of peoples are displaced because of flood. It was heaviest rainfall in last 20 years In August 2019, Sangli district has been badly affected by floods because of over flooding of krishna river.. Brahmanaal and Haripur village is among of these affected places. The main reason of flood situation in Kolhapur, Sangli and Satara districts of Maharashtra is mismanagement on releasing the water from various dams. The Koyna dam was full with water then dam's gates opens automatically this causes increase in the water level of Krishna river . This increased level will affect the places nearby areas of Krishna river deserves. This water start enter in the Villages, Cities and Agricultural areas. In addition of this Almatti dam's back water will also responsible for increased level to nearby areas of Krishna river deserves. Our main aim to design this project to communicate between 1st dam (Koyna dam) and 2nd dam (Almatti dam) and maintain the water level at Sangli below Danger level i.e below 45 feets Our proposed project uses sensor to sense the water level communicate two dams with each other and then opens the dam gate according to the dangerous level for flood . Our system uses Ultra-sonic-sensor for this purposes. The sensor are mounted at both dams in order to check water level and control the flood accordingly. When water reaches 45 feet at city bridge then it provides a signal to the 2nd dam (Almatti dam) controller and it opens the dam gate partially. As soon as the water level reaches the danger zone it signals the controller and the controller then signals the motor to run which is demonstrated as opening the dam gate fully. In this way the flood is controlled by using our proposed system. Our system will take care of water should not increase danger level for flood.

II.   LITERATURE SURVEY

A.   Real Time Monitoring and Controlling of Water Level in Dams using IoT

[1] In this paper author mentioned that dams are controlling flow of water, avoid flood, manages water, stores water so, controlling of dam is very necessary. Previous system provides manual controlling of dam gates. A author made a system which will control the dam gates automatically. Their system provides automatic controlling of dam gates. Authors system consist of water level sensor which collects the data of water level in dams. We studied how to control the dam using IOT from this paper

B.   IoT based Disaster Monitoring and Management System for Dams (IDMMD).

[2] past system of control dam gates is manual. It increase probability of errors and maintenance. Mismanagement of dam causes man-made disasters . To avoid these problems author implemented real time monitoring and management system for dam using IOT. We studied how to open shutters of dam automatically. It is mechatronics system to open shutter of dams for maintaining a safe water level in dam.

C. *Dam Water Level Monitoring and Alerting System using IOT.*

[3] dam water level; monitoring & alternating system using IOT. In this paper author mentioned about dam water level monitoring and alternating system. Author made system which avoids the flood by using internet of things(IOT).

D. *Design of Flooding Detection System Based on Velocity and Water level DAM with FSP8266*

[4]Author mentioned in this paper about flood detection system. Author studied in Indonesia about flood. In this paper author mention that Indonesia is a tropical country with high rainfall intensity and prone to flooding. Indonesia is the Tropical country where rainfall is very high. To prevent flooding disaster author made a flood detection system. The ESP8266 is a micro-controller with minimum power consumption is used for the system. This system is helpful for altering of flood.

III. FLOOD SITUATION

Fig.1 Flood Situation in 2019 at Sangli

TABLE I

Sr. No.	Year	Water level in feet's at Irwin Bridge, Sangli
1	2005	53.2
2	2006	44
3	2007	42.75
4	2008	35.5
5	2009	24
6	2010	28
7	2011	44
8	2012	18.75
9	2013	38
10	2014	29.5
11	2015	18.5
12	2016	34.5
13	2017	32.1
14	2018	24
15	2019	57.6

Table1. Flood data at Irwin bridge, Sangli from 2005-2019

IV.   METHODOLOGY

Previous systems of dam monitoring and controlling are manual. Our project Dam Communication to prevent flood is totally new idea. We made a project which will avoid the flood. In our system, we considered two dams (Koyna and Almatti dam) and one city bridge(Sangli bridge) to avoid the flood in Sangli and nearby villages. In this project first dam (Koyna dam) measures water level in itself and controls the gate opening and closing using Micro-controller(ATmega328p). It also send the data of water level to the Thingspeak website through node mcu. We used Internet of Things (IOT) for this purpose. From which public would know the status of water level in Koyna dam. Circuit placed at City bridge(Sangli bridge) is able to send the status of water level about Sangli to Thingspeak website. For sensing of water level Ultrasonic sensor has used. It sends signal to Almatti through IOT. If the water level increased above the 45 feet (danger level) then it will send signal to second dam (Almatti dam) to release the water. Because of which water level in Sangli will not increases above danger level and flood will be avoided. Second dam (Almatti dam) receives the status of water level from website about Koyna dam and Sangli bridge. Almatti dam also checks the water level in itself. It compares water level in Koyna dam, Sangli bridge and Almatti dam and controls the gate opening and closing of dam.
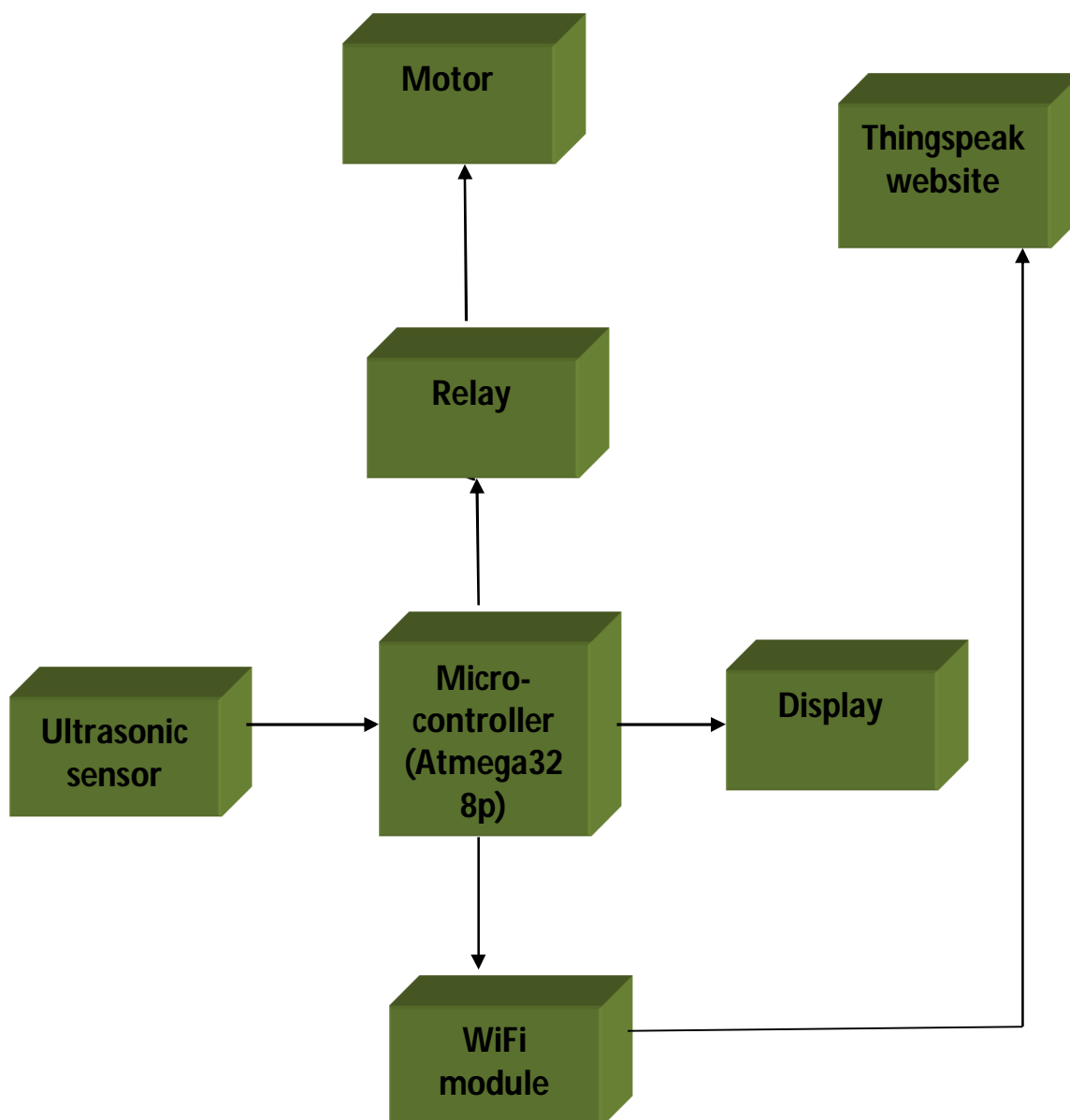
V.   BLOCK DIAGRAM

Fig.2 First Dam (Koyna dam)

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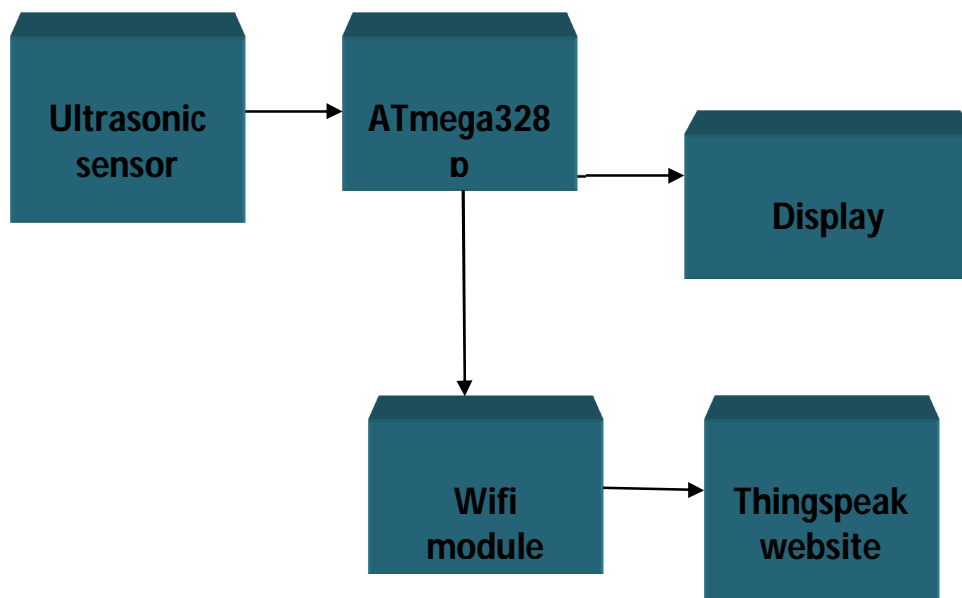*Volume 8 Issue III Mar 2020- Available at www.ijraset.com*
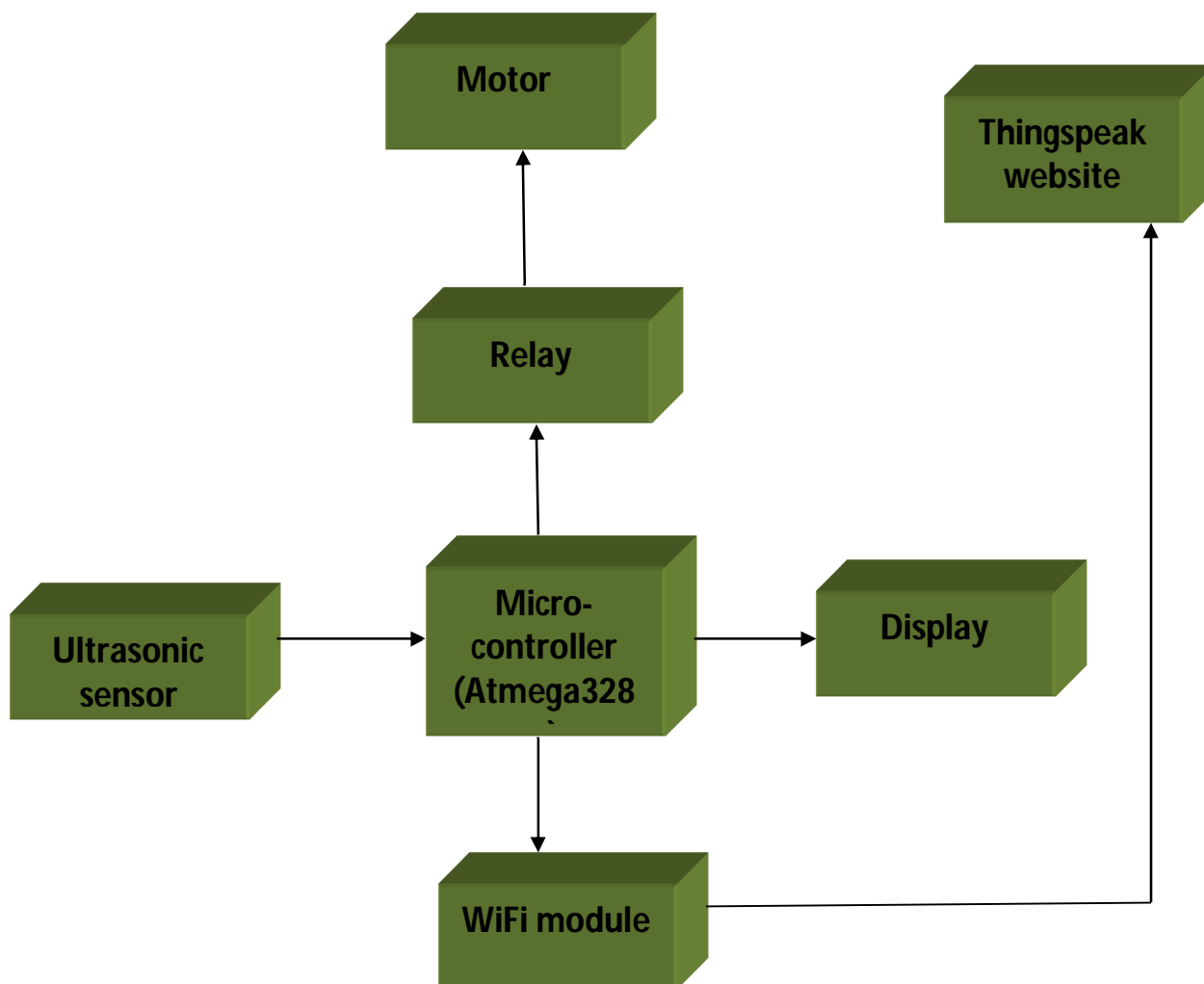
Fig.3 City Bridge (Sangli Bridge)

Fig. 4 Second Dam (Almatti Dam)

VI. WORKING PRINCIPLE

This system can be explained in three different parts

A. *1st Dam (Koyna dam)*
B. *City Bridge (Sangli Bridge)*
C. *2nd Dam (Almatti dam)*

1) *1st Dam (Almatti Dam):* There is Ultra sonic sensors is used. We also used micocontoller (Atmega328p). Ultra sonic sensors measures level of 1st Dam (Koyna dam). Micro-controller sends the status of 1st Dam(Koyna dam) sends the signal to IOT web for display the status of water level through node mcu. It is IOT based system. It helpful for public to know what is the water level. Micro-controller controls the motors/pump for water flow from dam. It will measure water level & increasing level in water and controlling the flow. Status of water level is sends to 2nd dam (Almatti dam) for controlling the flood.

2) *City Bridge*: Circuit placed at City bridge(Sangli bridge) is able to send the status of water level about Sangli to Thingspeak website. For sensing of water level Ultrasonic sensor has used. Sangli bridge take care about the water level will not increases above danger level. It sends signal to Almatti through IOT. If the water level increased above the 45 feet (danger zone) then it will send signal to Almatti dam to release the water. Because of which water level in Sangli will not increases above level and flood will be avoided.

3) *2nd Dam:* Signal from 1st Dam and bridge is fed to 2nd Dam(Almatti dam). 2nd Dam (Almatti dam)have gate which will open when level of water riches to danger zone at City bridge and micro controller at bridge decides how many gates will open. when level at bridge decreases then gates will stop the flow at 2nd Dam (Almatti dam). Second dam (Almatti dam) receives the status of water level from website about Koyna dam and Sangli bridge. Almatti dam also checks the the water level in itself. It compares water level in 1st dam (Koyna dam), City bridge(Sangli bridge) and 2nd dam (Almatti dam) and controls the gate opening and closing of almatti dam.

VII. ADVANTAGES

A. Real Time System.
B. It is used for mainly to avoid flood situation.
C. It saves an economics.
D. It provide security to people in rainy season.
E. All operation will be controlled by automatically.
F. It is used to monitor and controlling the flood at
G. IOT based Monitor and Control.

VIII. RESULT

Flood control is very essential to avoid loss of human, livestock and economics. So we made such a system which will control the flood.

We considered two dams which will communicates with each other. 1st dam (Almatti dam), bridge sends the status of water level to 2nd dam. 2nd dam compares the water in 1st dam, water level at Sangli bridge and water level in it's own dam and then opens the gate of Almatti dam.

When water level is below the 45 feet (Danger level) at bridge, then 2nd dam will not open the gates.

When water reaches to 45 feet at bridge, then 2nd dam will open the gates to avoid flood. When water level again decreases below the 45 feet ,then 2nd dam will close the dam gates.

The status of water level of both dams and bridge is displayed on Thingspeak website. People can get access the information about what is the status of water level. So, they get alerted and it will also avoid the rumors.
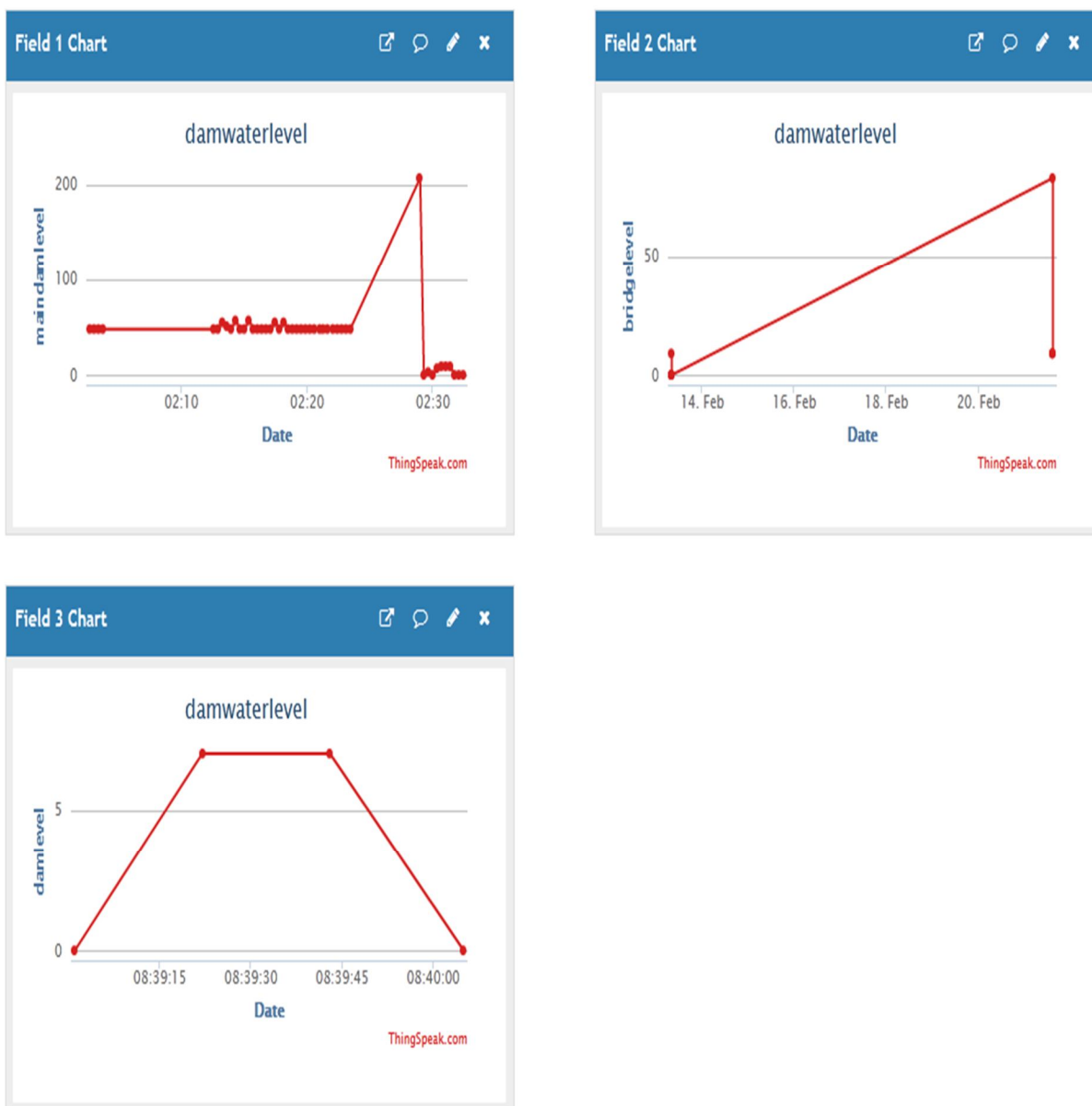
Fig 5. Result of IOT Things peak website

This information can be accessed by people through Things peak website. Field1chart:- It shows the water level of main dam that is Koyna dam The first chart shows what is the water level of koyna dam. On the X-axis it displays date and timing, Y-axis consist of water level. For example- At 2:10 pm water level is 50 Field1chart:-It shows water level of City Bridge which is useful for people to know the status of water level. Field3chart:- It shows water level of Almatti dam.

IX.   CONCLUSION

The problem of flood can be avoided by using our proposed system. The previous systems like flood monitoring system are only detects the flood. But "Dam communication to prevent flood "using IOT" system monitors and also controls the flood Using IOT. This system says environment and millions of lives.

Monitoring and controlling of water is became easy. Flood is prevented by using "Dam Communication to prevent flood using IOT."

X. ACKNOWLEDGMENT

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