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IOT BASED LANDSLIDE DETECTION

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Abstract **– A landslide is one of the major problems which India is facing mainly in the Northern region part. It is a critical issue which needs to be addressed and it not only leads to death of many people but also can cause financial destruction. In the proposed system we have developed IOT based landslide detection which will have some parameters to detect a landslide, this proposed system mainly compromises of three different modules which are river slide module which is placed to check the water level, the next is the hill slide module which will check water level as well detect the moisture in the soil the last and the most important module is the main side module which will be placed at the government office this main module will continuously ask for the data from the river side module and the hill side module and will keep updating the data on the website. The website and the module is connected using GSM technology which plays a very crucial role in this proposed system.**

Keywords : **Internet of Things, unique identifiers, Internet Protocol, GSM**

I. INTRODUCTION

1. Internet of Things is the concept of connecting any device (so long as it has an on/off switch) to the Internet and to other connected devices. The IoT is a giant network of connected things and people – all of which collect and share data about the way they are used and about the environment around them. IOT is surely emerging as a good technology because it is making the lives of the people easier. Landslide can be faced with proper planning and execution. Landslide is affecting the lives of common people in one way or the other.
2. To tackle this problem the proposed system named IoT Based Landslide Detection has been introduced
3. The main unit voltage will be placed at the concerned government official so that message can be sent and alarm can also be activated.

I.I PROBLEM STATEMENT

As landslide is one of the major problems in the current scenario, the current IOT based landslide detection only help to detect a landslide and no major action takes place. Also the projects in this domain that are present only send SMS which can be neglected easily and no major step can be taken to avoid disaster so in the proposed system SMS & alarm will be added so that necessary steps are taken.

I.II OBJECTIVE

The objectives are as follows:

1) The very first objective is to detect the water level for instance if the limit is of 100 meter and the water rises above 100 meters then it will send an alert.

2) The second objective is to detect landslide by different parameters i.e water level sensor, vibration sensor and soil sensor

3) If there is any other emergency in a particular region for example swine flu alert or bird flu so currently in rural areas this is now done by letters which consumes a lot of time so this main control unit installed at the government office will display the message of emergency and send the message to an official too.

I . I I I SCOPE

Monitoring, forecasting and warning of landslide are the essential features for saving the lives and assets from devastation the project will help to give alert to citizens whenever a landslide occurs If any other emergency is there that can also be taken into consideration. • The IOT website will help us to fetch the data and send it to the hardware and the admin can also display a message at the website itself. Early detection is beneficial to all the stakeholder

II. LITERATURE SURVEY

According to Wan Muhamad Arif Hakim1, Aizat Faiz Ramli1, Hafiz Basarudin1, Mohd Azlan Abu1, Izanoordina Ahmad1, it is found that most of the landslides in tropical countries such as Malaysia can be categorized as shallow landslides. Majority of these shallow landslides are triggered by substantial rainfall during the monsoon season. The rain water is absorbed by the soil resulting in loss of negative pore water pressure. Landslide warning system can be produced by utilizing a rainfall monitoring system. Nonetheless, it is relatively expensive and difficult to accurately gauge the ground water level. [1]

Surface morphology, LIDAR [2] considers topographical images to perform modelling of the surface and detecting recent activity of landslides. Image Thresholding By Genetic Programming[3] makes use of satellite images to detect landslide activity in a region. Automatic Landslide Detection from remote sensing imagery using a scene classification method based on BoVW and pLSA[4] uses complex algorithms and k-NN classifier to detect landslide region and non-landslide region.[2]

III.MODULES AND FUNCTIONS

Research methodology refers to the techniques or tactics used to collect, select, process, and analyze information about a topic. A research article's methodology section allows the reader to objectively evaluate the study's overall validity and dependability. The proposed methodology incorporates both qualitative and quantitative perspectives. The following modules will be included in the system:

III. I River Side Module

The river side module has two different and efficient censors that is water level and vibration sensor the task of the water level sensor is to detect the water level and the task of vibration sensor is to the check and validate the vibration level and the battery will be given through the solar power battery supply. Wireless module will help to send data to the next module.

III.II Hill Side Module

The hill side module consist of three different censors that include water, vibration and soil the tasks are same the soil censor here will detect the moistness of the solid in the hill it will be placed under the ground.

III.III Main Module

After the data is processed and received from the modules then the message will be sent to the concerned official using the GSM module. And after the message an alarm will go on so that the alertness is created. Other important notice will also be displayed at the LCD and the LCD is in the main control unit.

IV. Circuit Diagrams

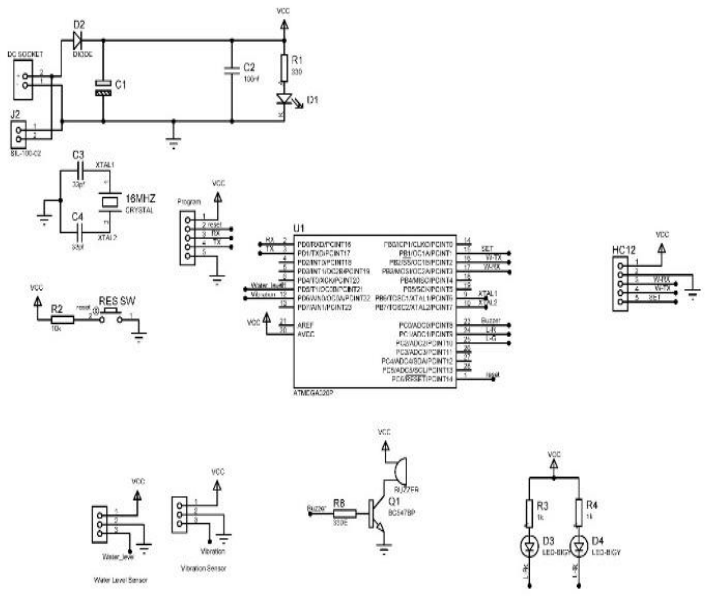

Fig 1. Circuit Diagram of river module

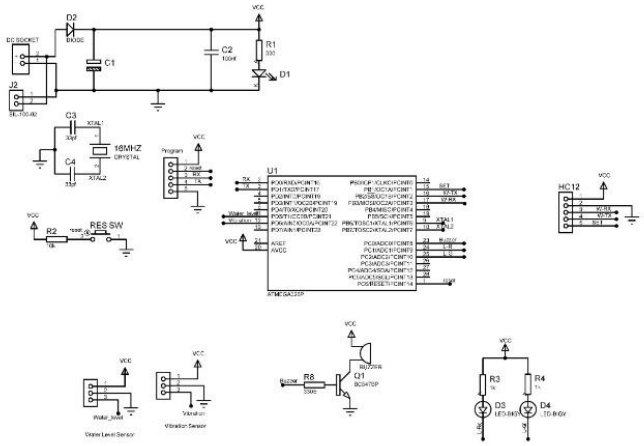

Fig 2. Circuit diagram of hill side module

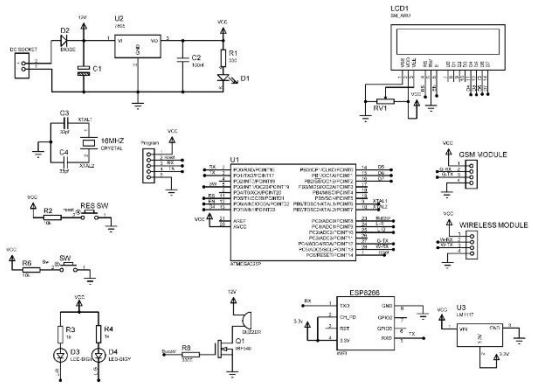

Fig 3. Circuit diagram of main module

V. RESULT AND CONCLUSION

The proposed system will not only help us to detect landslide but also to send a message at the concerned authority where other emergency messages also can be sent. With the help of alarm system alert message can be sent which will eventually save lives and prevent damage to the cars, properties etc. Also after the data is received from hardware to the website using GSM module the authority can act accordingly. The proposed system will not only help us to detect landslide but also to send a message at the concerned authority where other emergency messages also can be sent. With the help of alarm system alert message can be sent which will eventually save lives and prevent damage to the cars, properties etc.

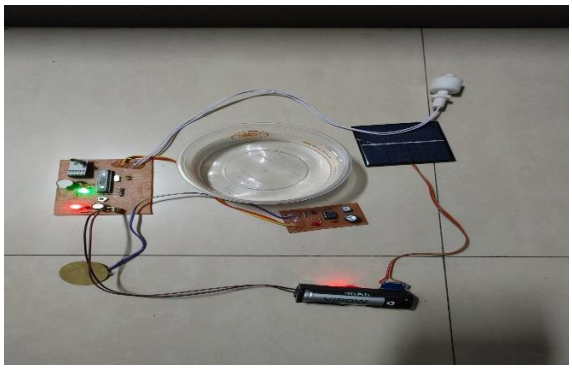

Fig 4. River Module

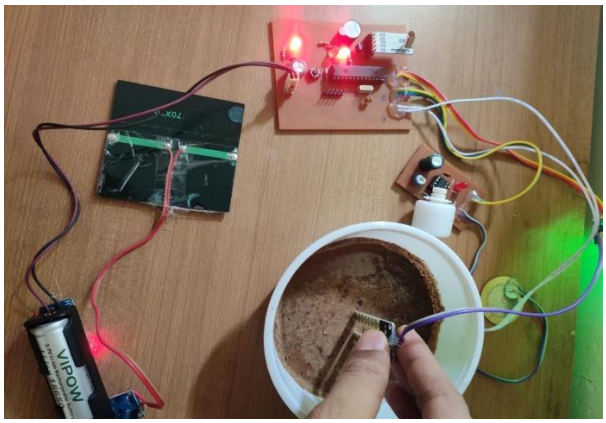

Fig 5. Hill Module

Fig 6. Main Module

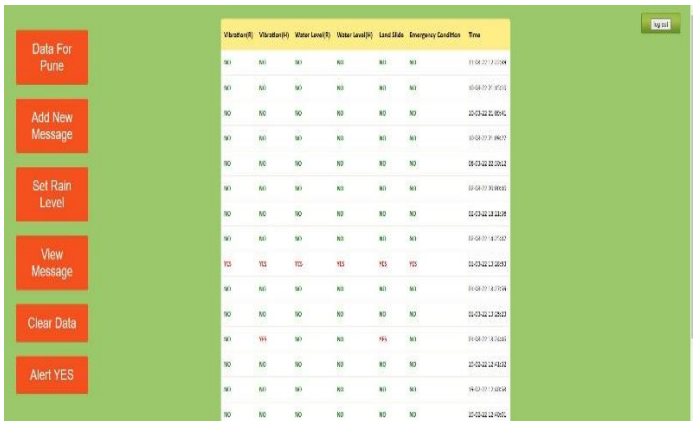

Fig 7. Still from website

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REFERENCES

[1] Jadhav Kanchan Eknath, Nalegaonkar Abhilash Dashrath, Salunke Vaishnavi Pandurang, Rajole Savita Dinkar "IOT Based Landslide Detection & Prevention System," IJARIIE-ISSN(O)-2395-4396, Vol4 Issue-2 2018

[2] Pawar Pitambar, Patil Akshay, Rathod Hardik, "IOT Based Landslide Detection & Monitoring," IIJARA(E_ISSN 2348-1269, P- ISSN 2349-2138), May 2019 Volume 6, Issue 2

[3] M. R. Surthy, R. Anjana, V. Dhanya "IOT Based Landslide Detection and Monitoring System," IJRESM ISSN: 2581-5792 Volume-3, Issue-4, April2020

[4] D. Petley, R. Rakuts, Global patterns of loss of life from landslide, Geologym Vol.40, no.10, p.921,2014.

[5] Putri Fatimah, Budhi Irawan, Casi Setiannigshi, "Design og Landslide Early Warning System Using Fuzzy Method Based on Android." 2020 12th Internation al Conference on Information Technology and Electrical Engineering (ICITEE), Yogyakarta, Indonesia

[6] M. R. Surthy, R. Anjana, V. Dhanya "IOT Based Landslide Detection and Monitoring System," IJRESM ISSN: 2581-5792 Volume-3, Issue-4, April2020]