International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 03 | Mar -2020 ISSN: 2582-3930

FOREST FIRE MONITORING AND DETECTION SYSTEM USING IOT

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ABSTACT- In the present area, wildfire is a disaster. In the current system, wild animals and forests, fields and human face the problems. This reduces the number of trees. Sometimes, 80% losses were caused by fire. Using this plan, you can easily find out what caused the fire. The system proposed an act of surveillance and dangerous. Iot based devices and sensors are used to product tree against the spread of wildfire. It uses two sensors .One is temperature and humidity sensor and another one is gas sensor. The temperature sensor senses the heat and smoke sensor senses any smoke caused due to burning or fire. Buzzer connected to Arduino gives us an alarm notification. It sends a warning to the system in the event of a fire (or) access this information through a cell phone.

KEYWORDS: Internet of things, Arduino, Fire, Forest fire detection, Sensors.

I.INTRODUCTION

The Internet of Things (Iot) towards a paradigm shift to owing to Iot services a wild range of fields to conduct. A major application field of Iot,Forestfire finding has become one such issue. Forest Fires are unrestrained fires occurring in wild areas and cause significant damage to natural and human resources are the extensive phenomenon in Indian forests [6]. The havoc due to forest fire has caused serious environmental problems and devastation of plants and animals. A forest fire is any form of uncontrolled fire that erupts in a forested area. Forest fires have proven tobe a huge form of destruction for humankind, especially when not countered through appropriatemeasures and strategies. In this system, we have built fire detector using Arduino Uno which is interfaced with a temperature sensor, a smoke sensor and buzzer. The temperature sensor minds the heat and smoke sensor senses any smoke generated due to burning or fire. Buzzer associated to Arduino gives us an alarm indication. Whenever fire activated, it burns objects nearby and produces smoke. In this project, we have built fire detector using Arduino Uno which is interfaced with a temperature sensor, a smoke sensor and buzzer. We have also interfaced LCD display to the Arduino platform [1].

II.LITERATURE SURVEY

In this section latest fire accident detection knowledges and intelligent prevention system are discussed. According to assessment of the Forest Guard Division of the Ministry of Environment and Forest, Government of India, fires in India annually affect 3.73 million hectares of forests. The development on fire detection technologies has been substantial over the last period due to advancement in sensors and hills of Uttarakhand. Events which lead to regular forest fires include man-made incidents, climate changes, and other factors; there has been a endless

increase in the frequency of forest fires [3].Many solutions for detection of forest fire are accessible and implemented in past few years. Video Surveillance System is most widely used for discovery of forest fire. It is divided into four categories: Video Cameras sensitive in visible spectrum based on credit of smoke during day light and fire flames at night, Infrared (IR) Thermal Imaging cameras based on discovery of heat flux from the fire, IR Spectrometer which identify spectral features of smoke gases and Bright Detection and Ranging (LIDAR) system which actions the laser light backscattered by smoke particles. The limitation of these systems was high false alarm rate due to impressive conditions such as appearance of fog, shadows, dust particles etc. Hence, a new scheme is been devised for fire discovery with sensors [3].

III.WORKING PRINCIPLE

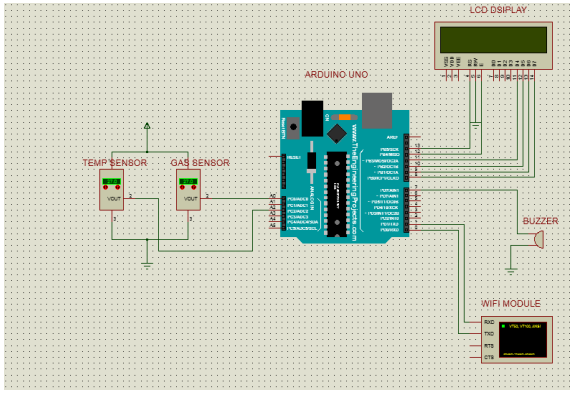

Fig 1.Circuit Diagram

One of the natural and important phenomena that usually accompany fires in general is the increase in temperature. This increase might be a cause of the forest fire, or a change of weather, such as the change of temperature in summer. When a forest fire occurs, huge masses of plants, trees, and bushes are burnt, releasing huge amount of energy which will increase the temperature. But this increase in temperature alone cannot be a valid reason to announce a beginning of a fire. Here we use temperature sensor (DHT11) to monitor temperature level in forest. In case the temperature level goes to maximum means, Buzzer starts to indicate alarm. Smoke sensors are a main type of fire detection systems. Forest fires release huge quantities of combustible and incombustible gases into the atmosphere, which may be detected easily. The emission of smoke fire can be detected by gas sensor. With the help of this sensor we find out fire occurs in forest or not. Thisinformationis monitored in LCD Display. We can see this detail in webpage through wifi module.

IV.OVERVIEW OF PROCESS

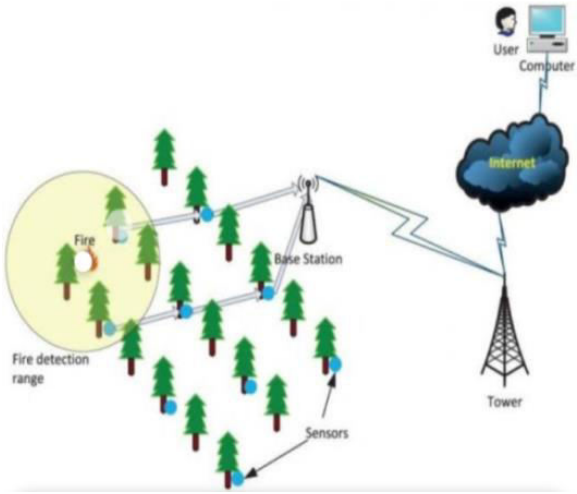

Fig 2.Process Diagram

V.COMPONENT DETAILS

A.ARDUINO UNO

ARDUINO UNO is a microcontroller board founded on the ATmega328P. It has 14 digital input/output pins (of which 6 can be cast-off as PWM productions), 6 equivalent inputs, a 16 MHz quartz crystal, a USB assembly, a control jack, an ICSP header and a rearrangebutton. It will have all to support the microcontroller; essentially interface will have a PC with a USB affiliation to supply power or power it with an AC-to-DC connector to start the procedure[2].

Fig 3.Arduino Uno Board

B.GAS SENSOR

This is a simple-to-use fluid petroleum gas sensor, appropriate for sensing LPG (confident of mostly propane and butane) courtesies in the air. The MQ-6 can notice gas attentionswherever from 200 to 10000ppm. This device has a high sympathetic and fast response time. The sensor's output is an analog fight. The drive circuit is actual simple; all you essential to do is control the heater coil with 5V, improve a weight resistance, and attach the output to an ADC.

Fig 4.Gas Sensor

C. DHT11 SENSOR

This DHT11 Temperature and Humidity Sensor structuresaadjustednumerical signal output with the temperature and humidity sensor ability. It is combined with a high-performance 8-bit microcontroller. Its knowledgesafeguards the high dependability and outstanding long-term constancy. The humidity sensor notices both wetness and air temperature. The device which is used to quantity the moisture of the air is called Hygrometer. If it senses any irregularstate then the attentivecommunication will be sent to the forest department [5].

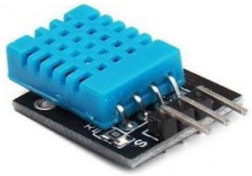

Fig 5.Temperature and humidity sensor

D.BUZZER

ABUZZERis a minor yet effectivemodule to add sound structures to our scheme/organization. It is very small and compacted 2-pin assembly hence can be simply used on breadboard, Perf Board and level on PCBs which makes this a extensively used component in greatest electronic submissions.

Fig 6.Buzzer

E. WIFI MODULE

The ESP8266 Wi-FiComponent is a self-sufficient SOC with combined TCP/IP procedure stack that can give any microcontroller admission to your Wi-Fisystem. The ESP8266 is accomplished of also hosting anrequest or divesting all Wi-Fi networking purposes from another claim processor.

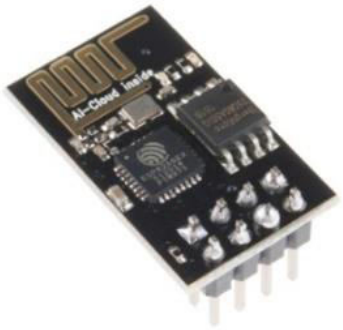

Fig 7.Wifi Module

VI.CONCLUSION

Early detection of fire hazards is ways to prevent fire and to prevent the pollution of the environment using the Iot system. It is very simple to detect and correct when a fire begins. In this system you can find out about the fire using Arduino .the event of the fire, information will be send to the registered person. Then, the buzzer will be run. With the project, forests and animals are undamaged. Deforestation can also be prevented by using this method.

VII.REFERENCES

1.Abhinav Kumar Sharma1 , Md Faiz Raza Ansari2 , Md Firoz Siddiqui3 , Mirza Ataullah Baig4 1,2,3,4 GLBITM, Gr. Noida, U.P.,"IOT ENABLED FOREST FIRE DETECTION AND ONLINE MONITORING SYSTEM", International Journal of Current Trends in Engineering & Research (IJCTER) e-ISSN 2455–1392 Volume 3 Issue 5, May 2017 pp. 50 – 54 Scientific Journal Impact Factor : 3.468

http://www.ijcter.com

2. T. Saikumar, P. Sriramya "IOT ENABLED FOREST FIRE DETECTION AND ALTERING THE AUTHORITIES", International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-7, Issue-6S4, April 2019

3.Dr.S.Praveenchakkaravarthy1 , J.Nancy 2 , V.S.NaveenKumar 3 , NeethiNarayanan 4 , R.Pavithra 5 1Assistant Professor, 2,3,4,5 Student Members Department of Electronics and Communication Engineering Coimbatore Institute of Engineering and Technology "FOREST FIRE DETECTION SYSTEM", International Journal of Recent Trends in Engineering & Research (IJRTER) Conference on Electronics, Information and Communication Systems (CELICS'17)
Special Issue; March - 2017 [ISSN: 2455-1457] DOI:10.23883/IJRTER.CONF.20170331.020.LIGGU

4.Vinay Chowdary and Mukul Kumar Gupta "AUTOMATIC FOREST FIRE DETECTION AND MONITORING TECHNIQUES", See discussions, stats, and author profiles for this publication at:

5.RANJITH E1, PADMABALAJI D2, SIBISUBRAMANIAN S3, Ms. RADHIKA S4 1,2,3UG Scholars, Department of Computer Science and Engineering, R.M.K Engineering College, Tamil Nadu, India. 4Assistant Professor, Department of Computer Science and Engineering, R.M.K Engineering College, Tamil Nadu, India,"AN IOT BASED FOREST FIRE DETECTION AND PREVENTION SYSTEM USING RASPBERRY PI 3",International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 06 Issue: 03 | Mar 2019 www.irjet.net p-ISSN: 2395-0072

6. A. Sharma, B.S. Sohi, and S. Chandra "PREVENTING AND MONITORING OF FRAMEWORK FOR FOREST FIRE DETECTION AND DATA ANALYSIS USING INTERNET OF THINGS (IOT)" International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-8, Issue-3S, February 2019