IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10652

Anti-Smuggling Alarm systems for Trees in Forest

Neha Nagraj Airani[1], Ramya T[2], Varsha N[3], Dr Pooja S[4]

3rd Year students, Dept of ECE, KSIT, Bengaluru, INDIA[1-3]

Assistant Professor, ECE Department, KSIT, Bengaluru, INDIA[4]

Abstract: This is project is all about safe guarding valuable trees that is “sandal , red sandal ,sag wan and pink ivory from forest fires and smuggling activities. These trees hold immense value and are less in number. This system is designed to prevent the illegal activities taking place in the forest . It is designed to save the forest and the revenue of the nation as most of the trees are used in medical sciences and cosmetics. This proposed system also protects the forest from unfortunate events such as forest fires to prevent the loss of majority forests at once and to prevent such incident, to save forest around the world some inviolability measures need to be set up.

Keyword: Smuggling, forest fire, ADXL Sensor, Metal Detecting sensor ,fire sensor and microcontroller.

I. INTRODUCTION

This system is deployed to prevent the rampant smuggling of trees that has emerged as a grave global concern, threatening the very existence of our precious forests. Recognizing the urgent need to combat this illicit trade, we present the Anti-Smuggling of Trees Project, which consists of trees and three sensors such as metal detecting, ADXL and fire sensor as primary unit of the system . The ADXL and metal detecting are placed on the bark of the trees and the fire sensor is placed at a certain height from where it and sense smoke in the forest. The system consist of these three technologies from preventing the trees from smuggling and forest fires.

The goal of this paper is to procure a system that notifies the illegal activities taking place with the most valuable trees and other valuable medicinal plants. This system ensures to prevent the trees from getting cut down detriment with fire. This system will deploy a unique name for every tree to transit the exact location to the nearest check post and officers on duty in case of any smuggling and forest fires.

II. LITERATURE SURVEY

1. Forest officials seized 80 logs of khair wood worth around Rs 1 lakh, an air gun, a gold chain, two finger rings, two vehicles, battery powered chain saw and Rs 4 lakh in cash-The Times Of India
2. Forest guard among 6 killed in clash over timber smuggling at Assam-Meghalaya border.-India Today
3. Forest Department officials seized 40 kg of sandalwood from the three persons; all three have been lodged in jail -The Hindu
4. International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 3, Issue 9, September 2014Anti-Smuggling System for Trees in Forest using Sensors and at mega pu 328 controller. The proposed system is about smuggling of the trees like sandal, “Sag wan” etc.
5. Anil Kulkarni, Ajay Khandare, Mandar Malve (2014) Designed a system for wireless sensor networks for Protecting high-cost trees in remote jungles from fire and Poaching. Narhari, Kotkar (2014) implemented a system using Flex sensor and Zigbee which able to restrict the smuggling of trees in a forest where the human being not able to provide security.

III. METHODOLOGY

Firstly we give 230v AC to a DC female jack with the help of an adapter.

• Power will be given to the esp32 using a USB cable as the power from the adapter is of high voltage.
• We then give a hotspot connection to the esp32 ,for the BLYNK application to start working • After the connection is established we receive a message on the LCD saying “FOREST MONITORING.”
• Whenever there is any metal activity or movement of tress is detected the buzzer will send an alarm to the nearest control room and they will also receive a notification on the BLYNK application saying ‘SANDALWOOD TREE IS BEING CUT”

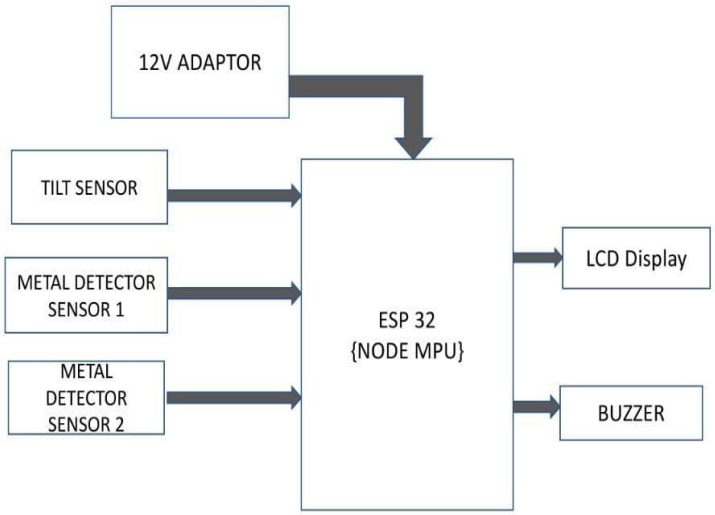
IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10652

• The same process repeats if there is any tilt in the trees is detected.
• There is also a fire alarm which senses any fire in the forest and sends an alert to the control room, and the buzzer hoots simultaneously.

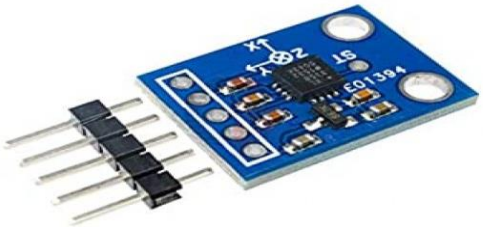


Description of the block:

1.ESP 32:

The ESP32 is a popular and widely used microcontroller module that integrates Wi-Fi and Bluetooth capabilities. Developed by Espressif Systems, the ESP32 is designed for a wide range of applications, including Internet of Things (IoT) devices, home automation, robotics, and more. Here is some information about the ESP32.

2.**ADXL sensor**:



refers to a family of accelerometers produced by Analog Devices, Inc. The ADXL (Analog Devices Accelerometer) sensors are widely used in various applications to measure acceleration and detect motion.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10652

3.**Metal Detecting Sensor:**

is a device that is used to detect the presence of metallic objects or materials in its vicinity. It operates on the principle of electromagnetic induction, utilizing a coil or antenna to generate an electromagnetic field and detect changes in that field caused by the presence of metal.

4.Buzzer:

is an electronic device that produces sound or an audible alarm signal. It is commonly used in various applications to provide audio feedback, indicate warnings, or generate alerts.

5.DC Female Jack:

also known as a DC power socket or DC power connector, is a type of electrical connector used for connecting a direct current (DC) power supply to a device or equipment. It is designed to provide a secure and reliable connection for the transmission of power.

6.Fire Sensor:

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10652

also known as a smoke detector or fire alarm sensor, is a device designed to detect the presence of fire or smoke in its surrounding environment. Its primary purpose is to provide an early warning of a potential fire, allowing for timely evacuation and fire suppression measures.

IV. WORKING PRINCIPLE

Components used:
1.ADXL sensor
2.Fire alarm
3.DC female jack
4.Buzzer
5.Metal detecting sensor
6.Adapter

The system consist of an ADXL sensor , metal sensor , fire sensor , Dc female jack and adapter .Through the adapter 12 volt power supply is given to the dc female jack, as the ESP 32 requires we give a separate power supply using USB cable from the laptop. The system starts when the lcd displays a message saying “forest monitoring” . The system is designed to senses any metal activity or fire in the forest .We start executing the project by taking any metal element near the metal detecting sensor , when the metal detecting sensor senses the metal the buzzer hoots and message is being displayed as “ Sand tree is being cut”. Then if any tree in the forest is tilted /moved from its original position the ADXL sensor senses the motion and sends the signal to the ESP 32 which will in turn hoot the buzzer and the lcd displays the message “rose wood is being cut”. Whenever there is smoke detected in the forest area the fire alarm will send a signal to the ESP32 which will in turn hoots the buzzer.

V. DISADVANTAGES

1. As this system need sensors to the installed every tree in the forest , this system can be expensive .

2. There are different ranges for a metal detecting sensor so we if want the metal detecting sensor of wide ranges we have to pay a high cost . So, if we want wide range metal detecting sensor we need to go for expensive onces.

3. Then ADXL sensor should always be at 90 degrees , even if a slight movement in the tree due to the rain, wind , natural calamities or weakness of the trees the buzzer starts hooting .So the chances of false alarm are more.

4. In case of the fire alarm , the time taken by officers/guards to reach the place is slightly high and hence as advancement of the project water sprinkler can be added .

5. As the system completes lies on the power supply the system fails to operate during power cut.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 8.066 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 10, Issue 6, June 2023

DOI: 10.17148/IARJSET.2023.10652

6. During the absence of the security guards , smugglers can turn off the power supply.

7. The sensors have to protected with a sheet or a box as they are prone to damage during rain.

8. Regular maintaince of the sensors are required.

9. The systems can harmed by animals present .

VI. FUTURE SCOPE

Anti-smuggling efforts will likely rely heavily on advanced technologies such as artificial intelligence (AI), machine learning, big data analytics, and block chain.

Future projects may focus on improving intelligence capabilities through improved data collection methods, intelligence sharing platforms, and collaboration with intelligence agencies and law enforcement bodies.

Future projects may include awareness campaigns, community engagement initiatives, and whistleblower protection mechanisms to encourage public cooperation and support in anti-smuggling efforts.

Future projects may emphasize improving financial intelligence capabilities, strengthening cooperation with financial institutions, and enhancing efforts to trace and seize the proceeds of smuggling through asset recovery mechanisms.

Future anti-smuggling projects may involve the establishment or enhancement of information sharing networks, joint operations, and harmonization of legal frameworks among countries to combat transnational smuggling networks more efficiently.

Future projects may adopt sector-specific approaches tailored to the unique challenges and characteristics of each domain, focusing on disrupting supply chains, strengthening enforcement, and implementing stricter regulations.

Future projects may focus on upgrading and integrating these systems to strengthen border control capabilities.

CONCLUSION

The goal of this paper was to procure a system that notifies the illegal activities taking place with the most valuable trees and other valuable medicinal plants. This system achieves and ensures to prevent the trees from getting cut down detriment with fire. This system will deploy a unique name for every tree to transit the exact location to the nearest check post and officers on duty in case of any smuggling and forest fires. This system also in turns protects the trees and animals in the forests.

REFERENCES

[1].https://www.thehindu.com/news/cities/Coimbatore/three-held-for-smuggling-sandalwood-in-erode-district/article66799496.ece
[2].https://timesofindia.indiatimes.com/city/goa/forest-officials-arrest-11-from-karnataka-maharashtra-for-smuggling-wood/articleshow/98881472.cms
[3].https://www.indiatoday.in/india/story/forest-guard-4-killed-clash-timber-smuggling-assam-meghalaya-border-2300320-2022-11-22
[4]. International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCRAEM - 2019 Conference Proceedings
[5]. International Journal of Innovative Science and Research Technology ISSN No: - 2456 – 2165 IJISRT17MY176 www.ijisrt.com 582 Anti-Smuggling System for Trees in Forest using GSM Technology
[6]. https://www.ijresm.com/Vol.3_2020/Vol3_Iss2_February20/IJRESM_V3_I2_2.pdf

