A survey paper on-Techniques used for ANTI-POACHING OF TREES

Chinmaye Reddy D.O[1], Bhuvana N[2], Amar Kamble[3], Keerthana G[4]
[1,2,3,4]*Department of ECE, Atria Institute of Technology*

Abstract **- Smuggling of very important trees such as Sandalwood in forests and also a forest fire poses a serious threat to forest resources which results significant economic damage and ultimately has quite a destructive effect on the environment all over the world. To limit their sneaking and to spare Woodlands around the world some preventive estimates should be conveyed. This survey paper proposes different technologies used for anti-poaching system.**

I.INTRODUCTION

In recent years there are numerous occurrences of hunting of economically and environmentally important trees in forest areas such as sandalwood, teakwood, pine and rosewood.

Hunting/poaching is not related to a particular country; it is spread across all the countries. So poaching is a threat to the environment and its inhabitants. presently the most common hazard in forest is forest fire and illegal logging of trees, and the poaching refers to the same. Forest fires are as old as forests themselves. They not only effects to the trees but also causes a serious threat for entire species living in that particular region, especially in summer season where there is no rain, the forest could burst into flames ignited by the slightest spark and trees, leaves, woods will be so dry which acts as a fuel to catch fire and burn.

In many forests it starts from natural causes such as lightning which may ignite trees but also the high temperature in atmosphere and less humidity also provides a favorable instance to start fire. Few cases will be manmade, when a fire comes from cigarette, naked flame, bidi, electric spark, or any other spark comes in contact with the inflammable material.

Illegal logging of trees refers to all criminal activities related to harvesting, processing, and trade in wood. Illegality occurs when laws or rules are broken at any point, for example cutting of trees with an illegal license or in a protected area, processing of logs without actual license, employing illegal workers, not paying particular taxes, or exporting goods without paying export duties. All these unlawful activities occur due to the inappropriate legislation, corruption, lack of maintenance and lack of laws. These lead to environmental effects such as biodiversity loss and greenhouse gas emissions, which results in global climate change.

The existing system consists of appointing guards to look after the entire system for suspicious activity, however due to human physical limitations it is very difficult to monitor the entire area simultaneously, this shows that its unreliable and inadequate to hire guards. Another existing system in the CCTV cameras to monitor larger areas, it is difficult and costly to implement and maintain. Also, nowadays RF-ID tags are given in order to protect trees. Its same as tagging an `animal for Identifying a particular tree. However, this type of technology doesn't give the real time information, i.e. it won't inform while activity is currently happening instead detects only when the tree leaves its original position. To overcome all these problems many different Authors have suggested different technologies. Throughout this paper we are making an attempt to survey work done by Authors.

II.LITERATURE SURVEY

1. Hameen C Hamza,Haseel V,Krishna Raj Nair M K,Salah Abdhul Gafor proposed a work on Tree Theft control system using MATLAB. Here they used MSP430, sound sensor, vibration sensor and RF Booster pack in one module and the other module consists of RF Booster pack and display device. Where the sound sensor sense sound and sends it in analog form to filters, filters identifies whether its cutter's sound are not depending on its frequency and send information to MSP430.the signal vibration sensor is also send to the MSP430

MSP430 acts as a controller over here and based on the inputs from vibration sensor and sound sensor it sends message to display device and RF Booster is used for transmitting and receiving messages from one module to other.

2. N.Shilpa and C H Sundharani proposed a work on IOT based anti_poaching of trees. Here they used opamp as a controller, Gyro sensor to detect the bow of tree over certain point and temperature sensor, RF TX is for transmitting information from tree section and RF RX is used for receiving information to main server section, the Arduino uno is used as controller in server section, GSM, wi-fi module, cloud platform (thingspeak) is implemented here. The information is sent from tree section to server section and SMS is sent to authorities from GSM module, when sneaking action takes place.
3. Dr.M C Hingane,Vandana Datta Ingale,Snehal Chaudari ,Sonal Awachare proposed a work on protecting trees in forest using NODEMCU as controller ,Android app and sensors. Here they used accelerometer, fire sensor, PH sensor is for measuring quality of water, ultrasonic sensor for measuring sounds, buzzer and water pump turns on with the help of relay when any poaching activities occur.
4. Akshay D. Sonwane, V. N Bhonge and Ajay Khandare have proposed the work on wireless sensor nodes for Anti-Poaching. They used a microcontroller and WSN protocol, using a MEMS accelerometer it monitors vibrations produced while cutting the trees. The microcontroller used in this is low power msp430f5528 along with 2.4GHz CC2500 transceiver for communication. The main idea here is to design a portable Wireless sensor Network and It is mounted on the trunk of each tree. Even they used FFT for signal processing.
5. Sridevi Veersingam, Saurabh Karadi, Sapna Shukla, Mehar Chaitanya Yeleti have proposed the work on wireless sensor network nodes on Zigbee for temperature monitoring. This uses 8-bit embedded controller, Zigbee MATLAB and wireless sensor wireless temperature data logging system with 8-bit embedded microcontroller and low power Zigbee RF transceiver is designed. The function of this work is to monitor temperature continuously and to send the data to computer and they have implemented peer to peer network in their work.
6. Mrs. P. Madhavi, SK Razeena, SK Nowshad, Y. Susmitha, M.Sweety have proposed the work on an IOT based Anti-poaching alarm system for trees in forests. Here they have used Tilt sensor, Temperature sensor, Arduino uno, Wi-Fi module. In this they have used Thingspeak server and app to monitor the data generated and send it to forest officials. It consists of two modules one involving the sensors and the other will be the controller module. The Thingspeak application will continuously receive sensor data.
7. Jayaram K , Janani K, Jeyaguru R, Kumaresh, Muralidharan N (2019) have proposed the work on forest fire alerting system with GPS co-ordinates using IOT. This system is designed in such a way that it detects forest fire. In this system the microcontroller is used, its job is to control system activities and also some sensors are used to detect fire in the forest the solar panel is attached with battery is used for supply voltage. Arduino is interconnected with some sensors like smoke Sensors and temperature sensor. Arduino is also connected with WI-FI module and GPS module.
8. A. Divya, T. Kauilhanjali, P.Dharshini (2019) have proposed the work on “IOT enabled forest fire detection and early warning system”. This paper mainly talks about the feature of wireless sensor networks (WSN) as a presumable solution to the challenge of detecting the forest fires. This system uses various sensors attached and data is transmitted via the wireless medium to perform the activity.
9. Smitha Gaikurad, prof.Rajesh patil, Ajay Khandare, Anshuman Rai have proposed the work on “Design WSN node for protection of forest trees against poaching based on Zigbee”. In this system sensor part consists of four basic components, A sensing part contains 3 axis MEMS accelerometer and Microscope a processing part (MSP430F5529 microcontroller) a transceiver part (Xbee RF module) and it also works on portable wireless sensors node.
10. Manish Y. Upadhye, P.B. Borole have proposed the work on design on,” Real-Time wireless Vibration Monitoring System using LabVIEW”. Here the data-log file is used for vibration analysis

and analysis made is used to take care of safety working condition of machinery and used in good maintenance.

III.CONCLUSION

This paper has been addressed an overview of many technologies and its applications on anti-poaching of trees, and also made a review on existing systems. The IOT based WSN is very effective to detect the fire and smuggling of trees in various locations.

There are many sensors used to detect the changes occurred in surroundings and the data is sent to the controllers, from which the authorities will receive the messages. The sensors used over here are fire sensor, tilt sensor, Gyro sensor, accelerometer, PH sensor, ultrasonic sensor etc. The controller information is then uploaded to the cloud through which the messages are received by the Authorities.

REFERENCES

[1] Hameen C Hamza,Haseel V,Krishna Raj Nair M K,Salah Abdhul Gafoor, "Trees Theft Control system",2013 Texas Instruments India Educators' conference (TIIEC), India. doi :10.1109/TIIEC .2013.9

[2] N.Shilpa, ch.Sundharani, "IOT Based Anti-poaching of Trees", International Journal of Engineering and Advanced Technology (IJEAT), ISSN : 2249-8958, volume-8 Issue-5, June 2019, India.

[3] Prof.Dr.M.C.Hingane, vadana Datta Ingale, sneha choudhari, sonal Awachare, Pune India. International Journal of Engineering Development and Research (IJEDR) 2019, volume-7 Issue-4, ISSN: 2321-9939

[4] Akshay D. Sonwane, V. N Bhonge and Ajay Khandare "Design and development of wireless sensor Node for Anti- poaching" International Conference on communication and signal processing, April 2016, India.

[5] Sridevi Veerasingam, Saurabh Karodi, Sapna Shukla, Mehar Chaitanya Yeleti "Design of wireless sensor network node on Zigbee for temperature monitoring".2019 International conference on Advances in computing, control and Telecommunication Technologies, DOI 10.1109/ACT.2009.14.

[6] Mrs.P.Madhavi, SK. Razeen, SK. Nowshad, Y. Susmitha, M. Sweety" IOT based Anti-poaching alarm system for trees in forests".International Journal of Emerging Technologies and Innovative Research (JETIR), ISSN:2349-5162, Volume - 6, Issue 4, April 2019.

[7] Jayaram K, Janani K, Jeyaguru R, kumaresh, Muralidharan N " Forest fire alerting system with GPS co- ordination using IOT"in 2019 5th international conference on advanced computing and communication systems (ICACCS) combaore, India, 2019 pp.488-491, DIO: 10.1109/ICACCS 2019.8728383.

[8] A divya, T. Kavithanjali, p. Dharshini "IOT enabled forest fire detection and early warning system" in 2019 proceeding of international conference on systems computation automation and networking (ICSCAN) pondicherry, India, 2019, pp1-5 DIO:10.1109/ICSCAN 2019.8878808.

[9] Smitha Gaikwad prof.rajesh patil, Ajay khandare, Anushuman rai " Design WSN node for protection of forest trees against poaching based on Zigbee" CONECCT 2015.

[10] Manish Y. Upadhye, P.B. Borole," Real-Time wireless Vibration Monitoring System using LabVIEW".2015 International conference on Industrial Instrument and control (ICIC) May 28-30-2015, Pune,India.

[11] V.Zope, T. Dadlani,A. Matai, P. Tembhurnikar and R. Kalani, "IoT Sensor and Deep Neural Network based Wildfire Prediction System," 2020 4th International Conference on Intelligent Computing and Control Systems (ICICCS), Madurai, India, 2020, pp. 205-208, doi: 10.1109/ICICCS48265.2020.9120949.

[12] A. Imteaj, T. Rahman, M. K. Hossain, M. S. Alam and S. A. Rahat, "An IoT based fire alarming and authentication system for workhouse using Raspberry Pi 3," 2017 International Conference on Electrical, Computer and Communication Engineering (ECCE), Cox's Bazar, 2017, pp. 899-904, doi: 10.1109/ECACE.2017.7913031.

[13] H. Afzaal and N. A. Zafar, "Robot-based forest fire detection and extinguishing model," 2016 2nd International Conference on Robotics and Artificial Intelligence (ICRAI), Rawalpindi, 2016, pp. 112- 117, doi: 10.1109/ICRAI.2016.7791238.

[14] S. Gangopadhyay and M. K. Mondal, "A wireless framework for environmental monitoring and instant response alert," 2016 International Conference on Microelectronics, Computing and Communications (MicroCom), Durgapur, 2016, pp.16, doi:10.1109/MicroCom.2016.7522535

[15] Mr. Mr.V. Narasimman Asst.prof, Anand.M, Anandhakumar.c, Krishnan.T. "Design of WSN node for forest trees against poaching" march 2018, IJARSE (International Journal of Advance Reseaech in Science and Engineering) volumne no.07, special issue No.(02), ISSN:2319-8354,chennai (India).