

# Anti-poaching of trees using wireless sensor nodes with Internet of Things (IOT).

Mohammed shaffansuniad<sup>1</sup>, Praveen kumar R<sup>2</sup>, Nandini B<sup>3</sup>, Anusha A<sup>4</sup>, Mrs. Suganya.J<sup>5</sup>

<sup>1234</sup>student, Dept of ECE, Sri Sairam college of Engineering, Bengaluru

<sup>5</sup>Assistant Professor, Dept of ECE, Sri Sairam college of Engineering, Bengaluru.

**Abstract**—These days there are numerous occurrences about pirating of trees like Sandal, pinewood and so forth. These trees are in all respects exorbitant. They are utilized in the restorative sciences, beauty care products. To confine their sneaking and to spare timberlands around the world some preventive estimates should be conveyed. We have built up a framework which can be utilized to confine pirating. The structure framework utilizes three sensors tilt sensor, temperature sensor, sound sensor. Information created from these sensors is constantly checked with the guide of Blynk App. Through GPS the location of the tree will be tracked easily. As for the sensors, their yield gadgets are actuated through transfer switch. For tilt sensor and sound sensor a signal is enacted and for temperature sensor a water siphon is actuated. Created information is put away in Blynk Server over the Wi-Fi module. Backwoods authorities are told when any occasion happens with the goal that suitable move can be made. For further implementation we are using LoRa wan WiFi module that covers that covers around 10km to 15km for wide range of communication to receiver module and we can also use satellite communication (satcom) for longer range of communication. At present we are using Wi-Fi module in our project.

**Keywords:** Tilt Sensor, Temperature Sensor, sound sensor, Arduino Uno, Wi-fi Module.

## I. INTRODUCTION

Poaching isn't identified with India just, China, Australia and African nations are additionally battling with same issue. Indian sandalwood costs 12000 to 13000 INR for every kg.

[1]. Though in worldwide market Red Sanders costs INR 10 crore for each ton. The Indian sandalwood tree has turned out to be uncommon as of late, trying to control its conceivable misfortune the Indian government is endeavoring to restrict the exportation of sandalwood

[2]. For an individual, most extreme reasonable buy limit isn't to surpass 3.8kg according to Govt. Sneaking of sandalwood has made financial and peace issues in territories flanking in India. The fundamental target of this venture is to build up a framework which can be utilized to confine sneaking of sandalwood trees.

## II. LITERATURE SURVEY

1. Endangered red sandalwood seized from runners in Berhampur.
2. The Times of India, Ahmadabad. Plan to check interstate carrying of timberland woods.
3. 200 teak trees cut, timber pirated in Lucknow.
4. Punjab News line Network (18th December 2010). The circumstance has gone very more regrettable as timber and lakhs or Rupees are criminally being sold ideal under the nose of division.
5. The town of Suifenhe in China is home to a timber industrial facility that forms in excess of 5 billion pounds of wood for each year, the majority of which originates from Russia By sneaking.
6. The circumstance has gone very more awful as timber, lakhs of rupees is by and large criminally sold ideal under the nose of the concerned office.

### III. EXISTING SYSTEM

Anti-Smuggling of trees was designed using flex sensors and ZigBee.

1. Wireless Communication in this system used ZigBee Module which is very slow and has lesser range than Wi-Fi Module which is used in Proposed System.

2. Flex Sensors are merely sensors but tilt sensors are inclinometers (which are used to measure slope or elevation and readouts apart from just signals).

sensor water pump is turned on in case of forest fire through relay switch.

### V. COMPONENTS USED:

**ARDUINO:** The Arduino UNO is an open-source microcontroller board reliant on the Microchip ATmega328P microcontroller and made by Arduino.cc.

The board is furnished with sets of cutting edge and straightforward data/yield sticks that may be interfaced to various improvement sheets and distinctive circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE by methods for a sort B USB interface. It will in general be constrained by a USB interface or by an outside 9 volt battery, anyway it recognizes voltages some place in the scope of 7 and 20 volts.

The ATmega328 on the Arduino Uno comes prearranged with a bootloader that empowers exchanging new code to it without the usage of an outside gear designer

Existing system block model

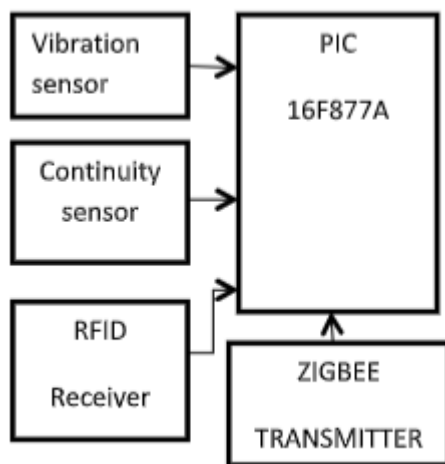


Fig1: Existing System

### IV. PROPOSED SYSTEM

The fundamental thought is to structure a versatile remote sensor hub which will be a piece of a Wireless Sensor Network..

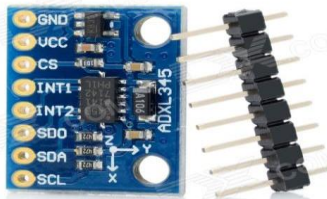
This system will consist of two modules one involving sensors and controller module which will be at tree spot and another one is Android phone. The Blynk application will continuously receive sensor data. This is an IOT based project where the sensor data is continuously uploaded to cloud over a Wi-Fi module.

In case of tilt sensor and the buzzer turns on when tree bends furthermore, for temperature



Fig2: Arduino UNO

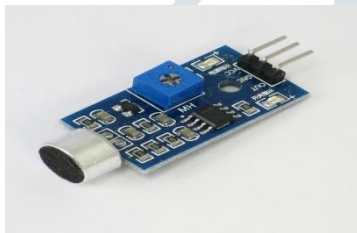
**TILT SENSOR:** Tilt sensors are utilized to quantify edge inside a constrained scope of movement. Tilt sensors are called as inclinometers in light of the fact that the sensors simply produce a flag yet inclinometers produce both readout and a flag. These gadgets produce an electrical flag that shifts with angular movement.



**Fig3:Tilt Sensor ADXL345**

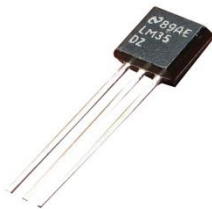
**SOUND SENSOR:**The Sound Sensor is a board that joins a receiver and some preparing circuit.

It isn't just gives a sound yield yet in addition a double sign of the nearness of sound and a simple portrayal of sound's abundance



**Fig4: Sound Sensor LM393**

**TEMPERATURE SENSOR:** In case of fire accident in the forest it will be sensed by the temperature sensor.

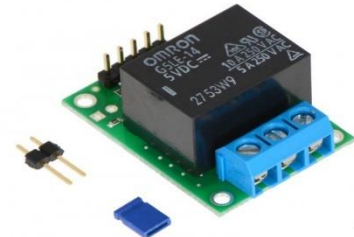


**Fig5: Temperature Sensor LM35**

**RELAY SWITCH:** High voltage electronic gadgets can be controlled utilizing transfers.

A Relay is a switch which is electrically worked by an electromagnet. The Battery, Arduino Uno, Tilt Sensor, Temperature Sensor, Relay, Buzzer, Water Pump, Cloud, Blynk Application, Sound Sensor electromagnet gets initiated with a low voltage, for instance 5 volts from a microcontroller and it dismantles a contact to represent the deciding moment a high voltage circuit.

One of the most advantage is you can do with an Arduino is controlling higher voltage (120-240V) devices like fans, lights, heaters, and other household appliances.



**Fig6: Relay Switch**

**BLYNK APPLICATION:**

Blynk was intended for the Internet of Things. It can control equipment remotely, show sensor information and can store information. It has 3 segments: **Blynk App** – It enables us to make stunning interfaces for tasks utilizing different gadgets gave.

**Blynk Server** – It is in charge of the considerable number of interchanges between the cell phone and equipment. We can utilize our Blynk Cloud or run our private Blynk server locally. Its open-source, could without much of a stretch handle a huge number of gadgets **Blynk Libraries** - for all the mainstream equipment stages - empowers correspondence with the server and procedure all the approaching and out coming directions.



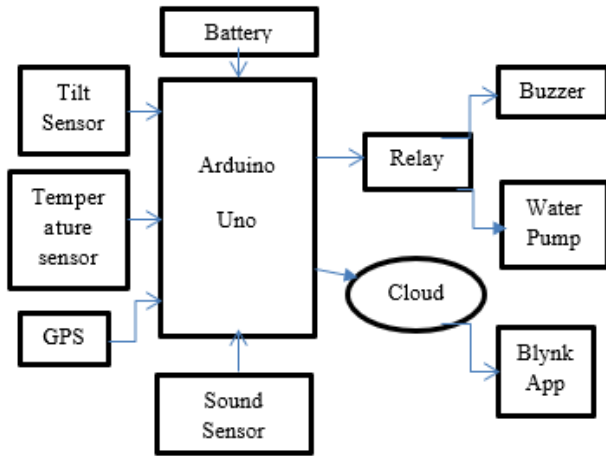
**Fig7: Blynk Application**

**GPS:** The Global Positioning System (GPS) is a space-based satellite route framework that gives area and time data in all climate conditions.



**Fig8: GPS**

**VI. BLOCK DIAGRAM**



**Fig8: Architecture of Anti-poaching Alarm system**

**A. Interfacing Tilt sensor with Arduino:**

The ADXL345 is appropriate to quantify the static increasing speed of gravity in tilt-detecting applications, just as unique quickening coming about because of movement or stun.

Its high goals (4 mg/LSB) empowers the tendency change estimation by under 1.0°.

**B. Interfacing Temperature Sensor with Arduino:**

For whatever length of time that the particles and electrons are moving current streams between the cathodes and the circuit, the circuit capacities legitimately.

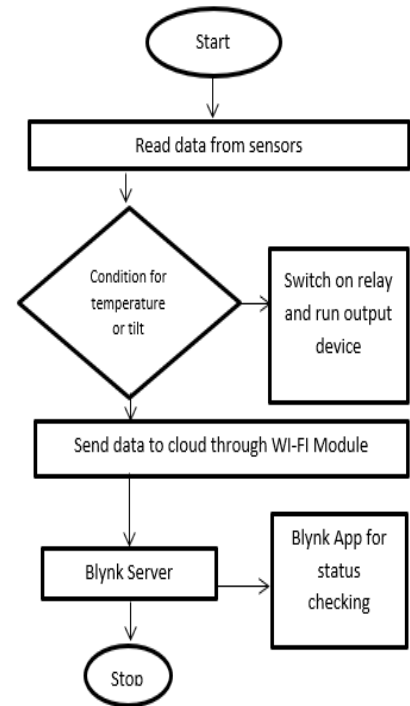
On the off chance that fire breaks out smoke particles get into the sensor and stop up the ionization chamber.

**C. Interfacing Sound Sensor with Arduino:**

This module enables you to realize when sound has surpassed a set point you chose Sound is distinguished through a mouthpiece and sustained into a LM393 operation amp. The sound dimension set

point is balanced through an on board potentiometer.

**VII. FLOWCHART**



**Fig9: Flow chart**

**VIII. IMPEMETATION:**

1. Every one of the sensors and the controller will be set up at the tree. At the point when tree logging happens, the sound created due to cutting out the tree is detected by the sound sensor. Arduino through the hand-off switch enacts the ringer advising the security work force. Additionally if the tree twists past limit edge, the ringer is actuated.

2. If there should be an occurrence of backwoods fires, when the temperature of the surroundings builds its detected by the temperature sensor, through the hand-off switch the water siphon is turned on. At the point when the temperature goes down underneath the set esteem, the water siphon quits working. 3. The information produced by every one of the sensors is constantly transmitted to the cloud which in our task is the Blynk Server.

It thusly sends the majority of the information to Blynk Application, by which at the work place backwoods authorities know the status of the trees and their condition.

#### IX. Advantages:

- since any gadget that is transmitting will require power and it will be practical .
- The framework work with least labor and low power utilization.
- Less perplexing and less resistance .

#### X. Future Scope:

- The main Edge innovation empowers to quantify woods utilizing all current estimation hardware and to exchange information gathered by means of Bluetooth and GPRS innovation Hyper spectral image analysis
- Lidar mapping
- Terrestrial laser scanning
- Mapping of forest can be detailed through tree mapping software to analyze each tree data.

#### XI. CONCLUSION:

1. This Project dispenses with the utilization of costly links and spare expense. It has numerous worthwhile applications.

This Project dispenses with the utilization of costly links and spare expense. It has numerous worthwhile applications

2. Along these lines we are building up the framework which ready to limit the carrying of tree in timberland where individual not ready to give security. Sneaking/burglary of most critical trees, for example, shoe wood in timberlands, represents a genuine risk to woodland assets, causes huge financial harm and at last has a significant obliterating impact on the condition everywhere throughout the world.
3. This venture causes us to carry Eco agreeable and brilliant taking care of with security of trees.

4. The main goal of our project is to enhance forest management efficiency and decrease trees illegal logging cases. The sensors will send the data to the blynk server application. And immediate alert is given to forest guard patrol. So that they can take immediate actions. Thus from implementation of this system smuggling can be prevented.

#### XII. REFERENCE

1. Jennifer Yick, Biswanath Mukherjee, Dipak Ghosal, Wireless Sensor Network Survey [J].
2. M. Tubaishat, S. Madria, Sensor Network An Overview [J]. IEEE Potentials, May 07, 2003
3. F.G. Nakamura, F.P. Quintao, G.C. Menezes, and G.R. Mateus. An Optimal Node Scheduling for flat Wireless Sensor Networks. In Proceedings of the IEEE International Conference on Networking (ICN05), volume 3420, pages 475-483, 2005.
4. Kovacs, Z. G., Marosy, G. E., & Horvath, G. (2010). Case Study of a Simple, Low Power WSN Implementation for Forest Monitoring. Proceedings of 12th Biennial Baltic Electronics Conference (BEC), ISBN 978-1-4244-7356-4, pp. 161-164, Tallinn, October 2010.